

A Young Researcher's Dual Lens: A Twofold Autoethnographic Exploration of Generative AI in the Realms of Doing Research and Teaching Computer Science and Media Design Education

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Abstract—This research paper unfolds the narrative journey of a young researcher immersed in the world of generative artificial intelligence (GenAI) tools. Situated in STE(A)M education, specifically in computer science and media design, this autoethnographic study chronicles the experiences of a PhD candidate concurrently navigating the roles of a teacher and research assistant. Through an autoethnographic lens, the researcher reflects on personal experiences and interactions with GenAI tools, exploring their roles in streamlining research workflows, creating teaching materials, and supporting educational processes. Findings reveal the transformative potential of AI in addressing challenges faced by educators and researchers, from time management to language barriers, while also emphasizing the importance of ethical considerations and ongoing professional development. Simultaneously, the narrative intricately weaves personal experiences with a scholarly lens, offering a unique vantage point that bridges theoretical discourse with the practicalities of the classroom. The researcher's academic landscape unfolds within an Austrian university as well as within a High School called College for Higher Vocational Education (levels 9-13), where AI becomes the backdrop for exploring the transformative impact of AI on teaching and research practices evolving into a catalyst for innovation, streamlining tasks for educators, and enhancing the overall learning environment. Methodologically, the study adopts an autoethnographic framework, providing an immersive exploration of the challenges, benefits, and evolving experiences encountered while integrating GenAI-powered tools in academic endeavors. The findings underscore the transformative impact of GenAI on literature research, methodological planning, and the drafting process, shedding light on the potential of GenAI to support young researchers in STE(A)M fields. However, the study also reveals challenges, such as the risk of hallucination by the AI tools and deskilling, prompting a call for a balanced integration of AI tools. The narrative concludes by discussing the implications for young researchers in the STE(A)M domain and the broader educational landscape. Emphasis is placed on the importance of continuous improvement and teacher training in the ever-evolving digital education landscape. Notably, the paper connects with a prior publication that focused on the teacher's perspective, offering a holistic understanding of the multifaceted impact of GenAI in STE(A)M education. This narrative encapsulates the essence of a young researcher's exploration in a technology-infused educational and research environment, highlighting the nuanced impact of generative AI from both the research and

teaching fronts.

Index Terms—Autoethnography, Artificial Intelligence, AI in Education, Teaching, Experience, GenAI, PhD Student

I. INTRODUCTION

As a young researcher on your way to a PhD, you are confronted with a vast amount of hard work, from getting an overview of numerous research methodologies to thousands of papers in the field of your choice to earning harsh reviews from more experienced peers. If only there were a tool which facilitates the learning process of inexperienced novice researchers to tackle these obstacles. Lo and behold, a white knight in shiny armor appeared with the graceful sounding name ChatGPT.

The rapidly evolving landscape of STE(A)M education has led to the increasing use of AI-powered tools in academic settings, transforming the way researchers and educators approach their work. The integration of AI tools in STE(A)M education has significant implications for young researchers, as it can both support and challenge their academic pursuits. Previous research has explored the benefits and challenges of AI tools in education, but there is a lack of studies that examine the personal experiences of PhD researchers and teachers using these tools.

The research question can be phrased as: "Exploring the integration and utilization of generative artificial intelligence (GenAI) tools, how do these tools influence the work of both a PhD student and a teacher within vocational high school education?" This study aims to address the knowledge gap by providing an autoethnographic account of a researcher's experiences with AI tools in STE(A)M education, offering a unique perspective on the practicalities of integrating these tools in the classroom. Moreover, it introduces various affordable GenAI tools that have the capability to support not only young researchers but also experienced ones. The integration of GenAI into educational and research contexts has ushered

in a new paradigm, fundamentally altering the landscape of scholarly inquiry and learning processes.

A. A Teacher's Odyssey with AI

Within the walls of my College for Higher Vocational Education (level 9-13), where the pursuit of knowledge converges with the pragmatic demands of vocational training, the implementation of AI has become a beacon of innovation. As a teacher, I grapple with the daily demands of lesson planning, student engagement, and the constant quest for pedagogical excellence. The heavy workload, a perennial companion in the teaching profession, necessitates a strategic integration of AI tools to streamline administrative tasks, enhance instructional design, and create an environment conducive to both student and teacher success.

A supplementary paper addressing this topic has already been presented at an international conference in 2024. In this narrative, I explore the transformative impact of AI on my teaching practices, detailing the moments of revelation, the challenges faced, and the profound changes witnessed in the learning experiences of my students. Therefore, for this full paper, only the essential elements are summarized, while it delves deeper into aspects that were not extensively covered before, such as teacher development.

B. A Researcher's Pursuit in the AI Landscape

Simultaneously, the corridors of academia beckon as I embark on the challenging yet rewarding path of a research assistant and a doctoral candidate. My pursuit involves navigating the uncharted territories of AI in education, where theoretical frameworks meet practical application. The intersection of my roles as a teacher and researcher provides a unique vantage point, allowing me to bridge the gap between scholarly discourse and the lived experiences of educators on the ground.

This autoethnography serves as a reflective lens through which I examine the synergy between my roles, illuminating the ways in which my experiences in the classroom inform my research endeavors and vice versa. The dual responsibility of contributing to the academic discourse while meeting the demands of a vocational high school teacher forms the crux of my narrative. As I navigate the complexities of AI implementation, I unravel the intricate threads that connect theory to practice and classroom innovations to scholarly contributions.

II. RELATED WORK

A. Challenges and Chances of PhD Students

Undertaking a PhD, particularly in a foreign context, presents a myriad of academic and non-academic challenges [1]. For PhD students concurrently fulfilling teaching responsibilities, the dearth of resources and support underscores the imperative for enhanced communication and collaboration between learning developers and doctoral candidates [2]. The dual role of a PhD student and teacher engenders a unique blend of challenges and opportunities throughout the doctoral journey [3]. The discourse surrounding the value of teaching

experience during postgraduate study remains contentious, with divergent perspectives positing it as either a valuable asset or an encumbrance [4].

B. The Distinction of AI Terminology: GenAI – LLMs and GANs

Within the expansive realm of technological evolution, the terms AI (Artificial Intelligence), ML (Machine Learning), and DL (Deep Learning) delineate interconnected yet distinct facets of computational intelligence. AI embodies the overarching concept of endowing machines with the ability to simulate human intelligence, engaging in tasks ranging from problem-solving to natural language understanding. ML, as a subset of AI, concentrates on systems that learn and improve from experience without explicit programming, adapting their performance based on data input. DL further refines the scope, representing a specialized form of ML that involves neural networks with multiple layers, enabling the processing of intricate data for more sophisticated tasks.

Within this complex technological landscape, Generative AI emerges as a pivotal player. Positioned within the broader AI landscape, Generative AI refers to systems capable of producing new content autonomously, transcending mere data analysis to foster creativity and innovation. Specifically, Large Language Models (LLMs) represent a notable subset of Generative AI, excelling in comprehending and generating human-like language. Their capacity to understand context, nuances, and linguistic structures empowers them to contribute to a spectrum of applications, from content creation to conversational interfaces.

Additionally, within the realm of Generative AI, Generative Adversarial Networks (GANs) hold prominence. GANs operate on a unique adversarial training paradigm, involving two neural networks – a generator and a discriminator – working in tandem. This dual-network structure enables GANs to generate realistic content, bridging the gap between data-driven algorithms and the creative potential of AI.

Figure 1 shows the connection between these terms. By distinguishing between these terms, we unveil the intricate layers of AI, ML, and DL, while underscoring the distinctive contributions of Generative AI, LLMs, and GANs. These advancements not only push the boundaries of AI capabilities but also expand the horizons of applications, marking a transformative era in computational intelligence.

III. METHODOLOGY

A. Autoethnography as Method

Adopting an autoethnographic framework [5], this study merges personal experiences and scholarly analysis, allowing for a holistic exploration of the impact of generative AI on research and educational practices of a young academic. The autoethnographic approach involves an introspective examination of the researcher's interactions and engagements with the AI tools, blending subjective experiences, reflections, and interpretive analysis. The data collection process encompasses interaction logs, personal reflections, and reflexive narratives,

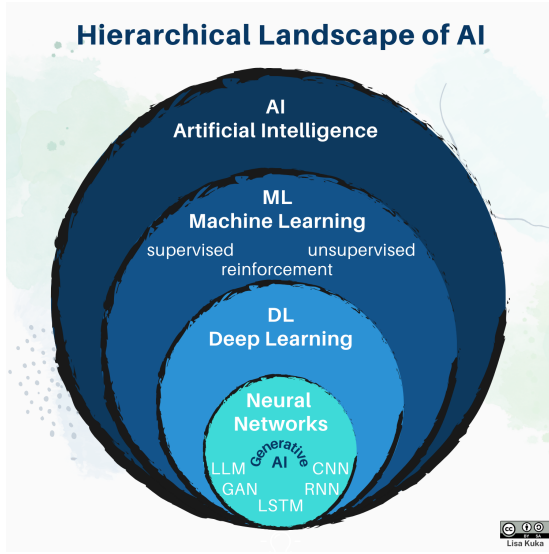


Fig. 1. Hierarchical Landscape of AI

capturing the researcher's encounters with GenAI tools such as ChatGPT across various research stages. This methodological choice aims to provide an in-depth, situated understanding of the influence of AI on the researcher's workflow, enabling the contextualization of personal encounters with generative AI within broader educational and research landscapes. Ethical considerations regarding the use of AI, as well as the subjectivity and biases inherent in the autoethnographic approach, will be critically examined throughout this study.

B. Process of Data Collection

The data collecting process is depicted in Figure 2. The duration of the study was three months in which all observations and reflections were noted in the form of a journal. Observations were frequently recorded in concise keywords, capturing immediate insights. However, at the conclusion of each week and again following each month, a more comprehensive reflection was undertaken to delve deeper into the observations and experiences. The ideas and thought processes underwent regular review at the end of each week and month, aiming to assess their alignment with existing research on the topic and their resonance with the researcher's own experiences. Furthermore, screenshots were taken and added to the journal.

C. Data Analysis and the Formation of the Narrative

These items constituted the primary dataset for the study, facilitating an in-depth examination of the researcher's experiences through both narrative and visual analyses. Initially, the analytical process involved identifying common tasks and challenges encountered by young researchers. Subsequently, focus shifted to delineating areas where GenAI tools could provide support, exemplifying the evolution of research practices from traditional to AI-infused workflows. Employing this methodological approach, the study aimed to offer a nuanced understanding of how GenAI tools are integrated and utilized

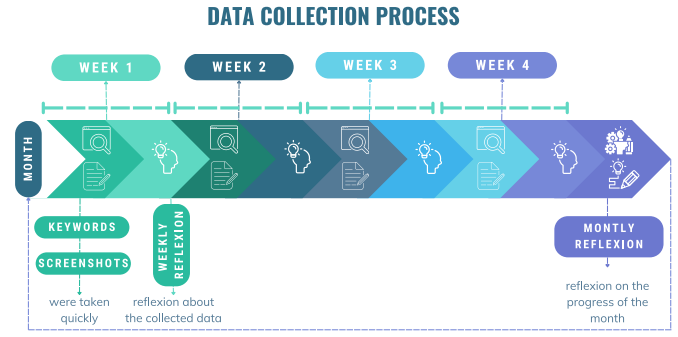


Fig. 2. Data Collection Process of One Month

within academic contexts. The findings are presented in line with the convention of autoethnographic studies [5], [6] as a narrative, in which literature is seamlessly integrated throughout the narrative. Moreover, various visual aids, including workflow graphics, were generated to visually depict specific research aspects.

IV. THE YOUNG RESEARCHER'S LENS

A. Obstacles Young Researchers Face

The outcome of the reflection process at the end of the initial month of the study was a mind map of obstacles and challenges young researchers face. The findings of this introspection can be substantiated by relevant literature. Although there are hardly any studies that deal with the difficulties young researchers in Europe are facing, especially from a young researcher's perspective, global studies support this subjective impression and list difficulties such as lack of mentoring, funds, heavy workload [7], academic writing skills [7], [8], insufficient research skills and uncertainties [7], [9], stress and time management [10], and job instability [11]. The findings of the study were assembled into a metaphorical

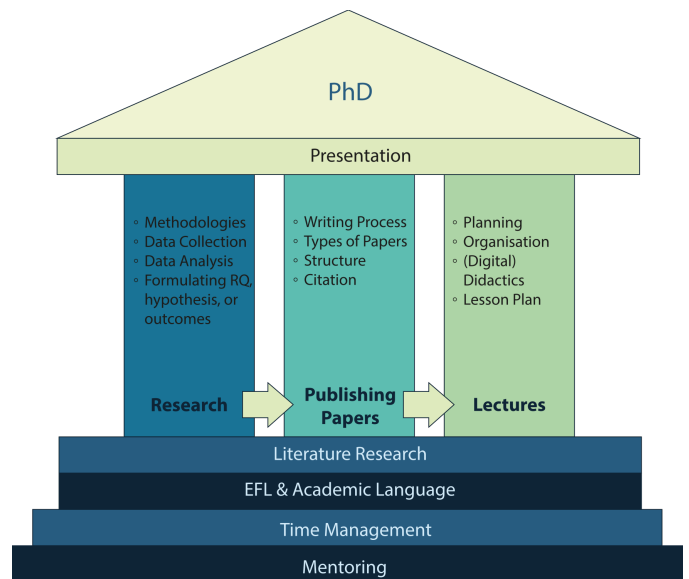


Fig. 3. Challenges of a PhD

house as can be seen in Figure 3. The foundation, crucial for stability and growth, rests upon the pillars of robust mentorship and a symbiotic relationship with the supervisor, emphasizing the pivotal role of time management skills and proficiency in English as a Foreign Language (EFL) and academic English. Additionally, a formidable foundation is laid by adept literature research skills, facilitating the identification of research gaps. The three supporting pillars form a logical progression, each intricately linked to the others. The first pillar involves the research process, encompassing methodologies, data collection, analysis, formulation of research questions, hypotheses, and outcomes. The second pillar is devoted to the culmination of research goals through paper publication, requiring proficiency in writing processes, paper structures, citations, and familiarity with applications such as LaTeX, Overleaf, and Mendeley. The third pillar involves the preparation of lectures, demanding planning, organizational skills, and digital didactic knowledge. Presentation skills serve as the overarching theme, vital for disseminating research findings at conferences, securing funding, and delivering lectures. The culmination of these elements forms the roof of the metaphorical house – the attainment of the PhD itself. This intricate structure encapsulates the myriad obstacles and difficulties encountered by young researchers in their pursuit of doctoral excellence.

Based on this analysis the researcher proceeded to identify specific stages within the research process where the integration of GenAI could offer assistance and streamline workflows which is discussed in the next chapters.

B. Impact on Research Workflow – from Traditional to AI-infused

The commencement of a PhD journey and the research process is indelibly marked by literature research. Traditionally relying on platforms such as *Web of Science*, *Google Scholar*, and *Scopus*, the advent of AI has ushered in a transformative phase in the academic landscape. Tools like *Elicit*, *Perplexity*, *Scite*, *Research Rabbit*, and *SciSpace* were used in order to conduct a literature review for a new research project. These tools not only streamline the research process but also offer enhanced functionality, providing examples for proper citation practices, suggesting appropriate language choices, and imparting notable phrases and vocabulary. This not only deepens the understanding of the paper's content but also serves as a facilitator for English as a Foreign Language (EFL) learning as well as fostering proficiency in academic language. A noteworthy contrast emerges when reflecting on the researcher's experience with a previous scoping review undertaken without the aid of AI tools; the integration of these tools markedly would have accelerated the entire process, exemplifying the efficiency gains afforded by AI in scholarly endeavors.

In the realm of research, a researcher's primary undertaking involves the meticulous planning and execution of the research process, encompassing methodological considerations, data collection strategies, and data analysis methodologies. This process is fundamental to formulating precise research

questions, hypotheses, and/or expected outcomes. During the initial literature review phase, where a lexicon of pertinent vocabulary was amassed, an innovative dialogue with ChatGPT was instigated. Remarkably, ChatGPT functioned not only as a linguistic resource but also as a collaborator in ideation. The model elucidated disparities in terminological usage and proffered insightful suggestions for research design, in addition to formulating potential research questions. While these suggestions were not blindly adopted, they served as a foundational framework upon which the researcher could expound and refine. This collaborative engagement exemplifies the synergistic intersection of human expertise and artificial intelligence, elucidating the potential of such interactions in augmenting the depth and scope of the research endeavor.

Figure 4 presents a comparative view of the traditional literature workflow juxtaposed with the AI-infused workflow. The latter incorporates additional tools from the outset, aiding in literature search and facilitating comprehension of scientific papers. It is worth noting the deliberate choice of the term "AI-infused" rather than "AI-powered." While both terms denote the utilization of artificial intelligence, "AI-infused" suggests integration or enhancement with AI as one component among others. In contrast, "AI-powered" implies a heavier reliance on AI as the primary source of functionality or capability. This distinction underscores the nuanced approach to AI integration within the research workflow.



Fig. 4. Traditional vs. AI-infused Research Workflow

Functioning as sophisticated language models, Elicit, SciSpace, as well as Research Rabbit aim to automate aspects of researchers' workflows, offering substantial support to both seasoned scholars and aspiring researchers alike. Particularly beneficial for early-career researchers, these tools provide a practical demonstration of effective literature review methodologies. It offers insights into the vocabulary commonly employed in academic discourse and illustrates how references

are seamlessly integrated into the narrative, fostering a deeper understanding of research practices.

While these tools prove instrumental in streamlining the research process, it is imperative for researchers, especially novices, to exercise caution and maintain academic integrity. Relying solely on Elicit's summaries is cautioned against, highlighting the importance of cross-referencing information by consulting the original references. To facilitate this, researchers can employ AI tools like *ChatPDF* or *AskYourPDF*, allowing them to download papers and interact with the content. These tools enable a more in-depth understanding of the material and provide mechanisms to verify comprehension. Additionally, researchers can formulate sentences and seek validation of their accuracy, ensuring that their interpretations align with the content of the papers.

Beyond the research process, Elicit users can enhance their language proficiency using supplementary AI tools. *Grammarly* serves as a reliable companion for checking grammar and vocabulary, ensuring that research output maintains a high standard of linguistic accuracy. Additionally, *QuillBot* offers a unique feature, allowing researchers to not only check language but also providing paraphrasing capabilities. This proves invaluable in refining the clarity and coherence of written content. The seamless integration of Elicit with these language-enhancing tools forms a comprehensive support system for researchers, empowering them to navigate the intricacies of language and maintain the quality of their scholarly output.

C. Supporting Young Researchers through GenAI

In the journey of conducting an autoethnography research, the researcher integrated ChatGPT as a valuable tool to engage in thoughtful discussions about the research topic. Armed with a broad conceptualization of their research goals, ChatGPT proved instrumental in the iterative process of refining their ideas. Beyond serving as a mere conversational partner, it became an active contributor to their research endeavors. As the researcher navigated the terrain of their research topic, the interactions with ChatGPT led to the discovery of additional research ideas, unveiling unexplored dimensions of their chosen subject. Moreover, the tool played a pivotal role in the identification of suitable research methods, offering insights and explanations about methods previously unknown. Figure 5, for example, shows the answer to what kind of data can be collected for an autoethnographic study.

ChatGPT emerged as a collaborative brainstorming colleague, fostering a dynamic exchange of ideas and inspirations. Notably, its creative input extended to the formulation of inspiring titles for potential research papers, enriching the overall depth and scope of the autoethnography research. Furthermore, this proved to be useful for the preparation of lectures, creation of workshops, and lesson plans as well.

The researcher used tools like Elicit and Perplexity to navigate the vast world of academic literature, facilitating the critical process of literature review. While these methods were useful in identifying relevant papers, discriminating between

You

You are an expert in research methods. What kind of data do I collect in an autoethnography, when exploring the potentials of generative AI in the research process of a young scientist? Give me answer in form of a table, please.

ChatGPT

Certainly! Here's a table outlining the types of data you might collect in an autoethnography exploring the potentials of generative AI in the research process of a young scientist:

Type of Data	Description
Personal narratives	Rich, detailed accounts of the researcher's experiences, reflections, and interactions with generative AI technologies, capturing subjective insights and emotional responses.
Field notes	Observations and reflections recorded during the research process, including interactions with AI systems, thoughts on their functionality, and any challenges encountered.
Multimedia artifacts	Visual or audio recordings, screenshots, or other multimedia artifacts documenting the researcher's engagement with generative AI tools, providing additional context and depth.
Reflexive journals	Ongoing reflections on the researcher's positionality, biases, and evolving understanding of generative AI, facilitating reflexivity and transparency in the research process.
Interview transcripts	Transcripts of interviews with other young scientists or stakeholders in the field, capturing diverse perspectives on the potential applications and implications of generative AI.

These data sources would enable you to construct a comprehensive autoethnography, offering insights into how generative AI influences the research practices and experiences of young scientists.

Fig. 5. ChatGPT's Answer on the Question Which Data Can Be Collected

the quality of contributions remained difficult. The challenging work of assessing manuscripts, particularly for a novice researcher, remained a tremendous challenge. While useful, GenAI tools introduced a nuanced layer of uncertainty and an undeniable assistance in expediting the review process, the inherent complexity of distinguishing between significant and substandard papers remained a challenge.

At one point the researcher explored the current capabilities of generative AI in producing nuanced, deep, and original content. While the technology currently falls short of achieving the level of sophistication found in high-quality research papers, there is a suggestion that it might evolve to pass this shortcoming. From the researcher's experimentation with ChatGPT, it becomes evident that while generative AI may not fully replace the traditional writing process of papers, it could serve as a valuable tool in authorship. Specifically, it proves beneficial in generating well-drafted paragraphs, aiding researchers in crafting introductory sections or setting the groundwork for subsequent discussions. Moreover, AI chatbots, when prompted, can play the role of a helpful devil's advocate by generating rebuttals to presented points, offering not only obvious counters but also introducing novel perspectives. This suggests that generative AI has the potential to stimulate critical thinking and raise questions akin to those encountered during a seminar, contributing to the refinement of papers. If

these tools can assist authors in the drafting process, there is the intriguing prospect that they could conserve intellectual effort, allowing for a more focused engagement with the actual research question or overarching conceptual framework. Another positive aspect is that for young researchers academic English and phrases can be challenging, this is even more true for young researchers whose first language is not English, struggling with more basic challenges like grammar, basic vocabulary, and connotations as well. ChatGPT is the newest addition to a long list of tools which facilitate the writing and translation process for young researchers with an EFL background. While *DeepL* uses AI for translating, *QuillBot* encompasses the tools paraphrasing, grammar checker, plagiarism checker, summarizer, translator, citation generator, and lately added co-writer, a tool implemented generative AI.

D. Challenges and Limitations of GenAI Tools for Researchers

The utilization of generative AI tools in research introduces a spectrum of challenges and limitations. One prominent issue involves the potential for hallucination, where the generated content may deviate from factual accuracy, posing a risk to the reliability of research outcomes. Furthermore, there is a concern about deskilling, as over-reliance on automated tools might diminish researchers' skills in critically evaluating and synthesizing information. Another challenge is the risk of researchers becoming complacent and developing a dependency on AI-generated content, potentially leading to a reduced inclination to thoroughly read and comprehend academic papers. These challenges underscore the need for a balanced integration of generative AI tools, emphasizing the importance of maintaining a researcher's core skills and critical engagement with the scholarly literature.

1) *Hallucination*: The authors encountered similar challenges, exemplified by a notable instance of hallucination illustrated in Figure 6, specially translated for this paper. The Figure depicts ChatGPT's response to an inquiry regarding the release dates of different versions of DigComp – a European digital competency model. The statement falsely asserts the existence of a third version currently in development. Despite no ongoing work on a third version, the misconception could be rationalized, considering the frequency with which new iterations of models and products are typically under development. So, a layperson might not notice the mistake. It is noteworthy to mention that Perplexity did provide a correct answer to the same question (Figure 7) as well as on the question if there is a third version under development, indicating the varying accuracies of different AI models.

2) *Deskilling*: In many educational settings, including schools, writing is often taught with an emphasis on the final product, overlooking the transformative nature of the writing process itself. However, an alternative perspective views writing as an iterative journey rather than a linear task. This approach recognizes writing as a process, involving multiple rounds of reading, feedback gathering, and rewriting to refine ideas and uncover new insights. While the integration of tools like ChatGPT into this process may streamline

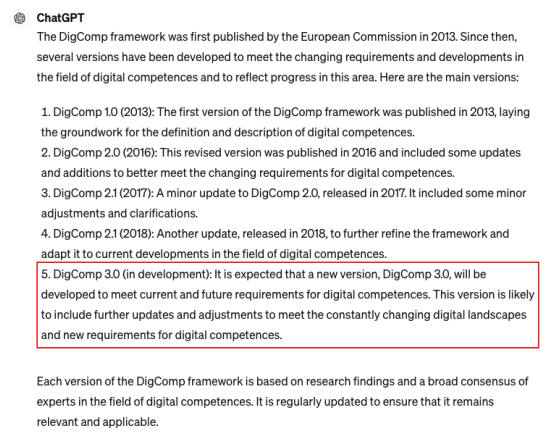


Fig. 6. DigComp overview according to ChatGPT (translated from German by the author)

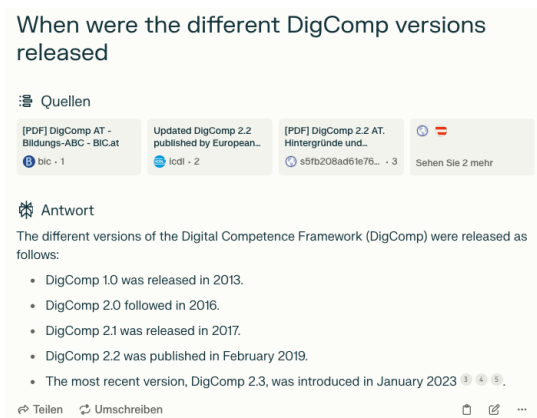


Fig. 7. DigComp overview according to Perplexity

rewriting, there is a concern that it could potentially inhibit the author's ability to generate novel ideas independently. During the process of writing, it is common to experience moments of contemplation and inspiration, leading to the generation of new ideas. However, when ChatGPT overtakes the writing process, these moments may not take place. Similar apprehensions have been expressed regarding the reliance on online databases, where researchers fear missing serendipitous discoveries and "aha" moments that may arise from chance encounters with unexpected articles in physical libraries. Although the shift towards online databases may have diminished these occurrences, the overall benefits of accessibility and efficiency provided by digital resources outweigh the potential drawbacks, highlighting the ongoing evolution of research methodologies in the digital age. Similar concerns were also articulated by Zohny [12].

3) *Academic Integrity*: The emergence of GenAI tools has provoked intricate discussions concerning their potential ramifications for academic integrity, particularly within the domain of scholarly writing [13]. Despite the prolonged availability and widespread use of AI-powered language assistance tools such as Grammarly (2009), DeepL (2017), and QuillBot

(2017), questions have rarely been raised regarding their legitimacy. The majority of research on scholarly writing tools has yielded positive results, emphasizing their role in providing assistance with grammar, punctuation, spelling checks, synonym suggestions, and paraphrasing. These tools have proven particularly beneficial for non-native English speakers in crafting scientific content, leading to notable improvements in machine translation accuracy. By facilitating the overcoming of language barriers, they contribute significantly to enhancing the efficiency and quality of writing for researchers [14], [15]. Moreover, the conventional expectation that scientific manuscripts undergo scrutiny by native English speakers or professional editing services prior to publication has long presented a formidable financial barrier for many researchers. Consequently, the integration of GenAI tools into the writing process has emerged as a practical solution, democratizing access to language refinement and editorial support. However, it is imperative to delve deeper into the multifaceted implications of employing such tools. While they undeniably streamline the writing process, they also prompt a reevaluation of traditional notions of authorship and scholarly rigor. Moreover, it's essential to recognize that the process of writing a paper represents just one phase in the broader research endeavor, following extensive preparatory work including formulating research questions, collecting and analyzing data. The publication stage serves to communicate findings effectively to the scientific community, and GenAI tools can greatly facilitate this process without diminishing the researcher's efforts. However, it is crucial to establish criteria for the ethical use of GenAI tools in research. A methodical workflow is imperative, involving thorough scrutiny of resources, ensuring generated text aligns with the author's intended message, and seeking feedback from colleagues. These steps are more vital than ever to uphold academic integrity amidst the increasing accessibility of AI-driven writing assistance. Moreover, the seamless integration of AI-generated text within scholarly discourse raises questions about the delineation between human and machine contributions, as well as the ethical responsibilities inherent in scholarly communication. Thus, while GenAI tools offer undeniable benefits in terms of efficiency and accessibility, their utilization necessitates a nuanced understanding of their ethical (such as plagiarism or bias) and epistemological implications (how knowledge is produced and validated) within the context of academic research and publication.

V. THE TEACHER'S LENS

A. Summary of Findings

A supplementary paper on this subject matter was presented at the CSEDU conference in 2024. Here, a short summary is provided focusing on the key aspects covered in that paper. Additionally, we offer a closer examination of topics that were not extensively addressed, including the aspect of teacher development.

The autoethnographic study yielded key insights into the impact of generative artificial intelligence (GenAI) on teaching and research practices in education:

Hidden Workload: Educators devote significant time to tasks beyond classroom instruction, such as material preparation and professional development. This shared sentiment, particularly evident in language classrooms, underscores the substantial workload educators face.

Transformative Impact: GenAI revolutionizes classroom dynamics, easing workloads, and reshaping teaching and research practices in education.

Enhancing Student Assessment: While GenAI shows promise in improving student assessment, caution is warranted due to ethical and practical considerations, necessitating a balanced approach in educational settings.

Challenges and Concerns: Concerns arise regarding content inaccuracies, potential deskilling of writing abilities, and the risk of reduced teacher involvement with overreliance on AI. Striking a balance between leveraging AI benefits and preserving the teacher's role is essential.

Implications for Education: Effective integration of GenAI in education demands evidence-based guidelines and policies to ensure responsible usage. Educators must impart the importance of foundational skills alongside technological tools to students.

These findings underscore AI's transformative potential in education while highlighting the importance of ethical considerations, balanced approaches, and ongoing research to navigate its evolving integration into educational practices [16].

B. Professional Teacher Development

As a PhD student holding a Pre Doc position, delivering lectures is among the multifaceted responsibilities. Throughout various conversations regarding professional teacher development, recurring feedback underscores the challenge of staying abreast of current knowledge as an educator. Despite possessing academic backgrounds and familiarity with scholarly literature, many teachers encounter difficulties comprehending complex academic content. Factors such as the English language barrier and the passage of time since their formal education contribute to this challenge. Following workshops held by the researchers demonstrating the functionalities of tools like Elicit, SciSpace, DeepL, and ChatPDF, participants expressed a sense of relief and demonstrated positive attitudes towards these technological aids. The ease of use and perceived usefulness of such tools emerged as pivotal factors influencing their adoption [17]–[20]. By effectively addressing users' needs, providing intuitive interfaces, and little to no prior knowledge of how to use these tools, they align with the criteria deemed essential for integrating new technologies into practice. Their ability to streamline tasks and enhance productivity resonates with educators, fostering a welcoming environment for the incorporation of innovative tools in their professional endeavors. These technological aids may hold great potential in bridging the gap between teachers' existing knowledge and the demands of academic discourse, ultimately facilitating continuous professional growth and development.

You

When teaching how to use ChatGPT, what are the foundational computer science concepts for a media design class of 16 year old students?

ChatGPT

When teaching 16-year-old students in a media design class how to use ChatGPT or similar natural language processing (NLP) tools, it's essential to introduce foundational computer science concepts in a way that relates to their interests and the creative aspects of media design. Here are some foundational concepts tailored for this context:

- 1. Text Input and Output:** Explain how text is inputted into the ChatGPT model and how the model generates text output based on the input provided. Emphasize the importance of clear communication and understanding user intent when interacting with the model.
- 2. User Experience (UX) Design:** Introduce basic principles of UX design and how they apply to designing conversational interfaces like chatbots. Discuss concepts such as user flow, conversational design, and designing for accessibility and inclusivity.
- 3. Content Creation and Curation:** Discuss the role of content creation and curation in designing engaging chatbot interactions. Encourage students to think creatively about the types of content that can be generated or curated by ChatGPT to enhance user experiences.
- 4. Data Privacy and Security:** Highlight the importance of data privacy and security when using NLP tools like ChatGPT. Discuss concepts such as data encryption, user consent, and best practices for handling sensitive user information in chatbot interactions.
- 5. Artificial Intelligence (AI) and Creativity:** Explore the intersection of AI and creativity in media design. Discuss how AI technologies like ChatGPT can be used to augment creative processes, generate ideas, and inspire new forms of expression in media design projects.
- 6. Scripting and Automation:** Introduce basic scripting and automation concepts to help students understand how ChatGPT can be integrated into media design workflows. Discuss scripting languages like Python and how they can be used to interact with NLP APIs and automate repetitive tasks.
- 7. Iterative Design Process:** Teach students about the iterative design process and how it applies to designing and refining chatbot interactions. Encourage students to gather user feedback, iterate on design ideas, and continuously improve the user experience of their chatbot projects.
- 8. Ethical Considerations in Design:** Discuss ethical considerations in designing chatbot interactions, such as transparency, accountability, and bias mitigation. Encourage students to consider the potential impact of their designs on diverse user populations and to design ethically responsible chatbot experiences.

By incorporating these foundational computer science concepts into the media design curriculum, students can develop a deeper understanding of how to effectively use ChatGPT and other NLP tools to create engaging and interactive media experiences while also considering ethical implications and best practices in design.

Fig. 8. Identifying core concepts when teaching ChatGPT

C. Teaching Material and Generation of Tasks

In the realm of teaching, the absence of standardized textbooks often prompts educators to craft their own teaching materials, a necessity particularly pronounced in rapidly evolving fields like computer science and media design. Given the swift pace of advancements in these disciplines, teaching materials and tasks must continually adapt to remain current while also elucidating foundational principles. GenAI emerges as a valuable ally in this endeavor, aiding educators in formulating lesson content, generating images, and sourcing compelling examples and metaphors tailored to the specific context of their class, school, or specialization. The collaborative synergy between educators and AI tools not only simplifies the process of creating teaching materials but also guarantees their pertinence and efficacy in captivating students with contemporary trends while reinforcing fundamental concepts.

As seen in Figure 8, ChatGPT proved instrumental in identifying the core concepts of computer science during its integration into a media design class curriculum. ChatGPT served as a valuable tool for brainstorming, providing the

teacher with insights into potential directions for the lesson and offering suggestions for relevant theories or topics that could enrich the students' understanding.

VI. CONCLUSION AND OUTLOOK

In conclusion, this autoethnographic study has provided a unique perspective on the integration of generative AI tools for PhD students and teachers alike, highlighting the transformative impact on teaching and research practices in vocational high school education.

The researcher's deep dive into AI-powered tools like ChatGPT and GenAI illuminates their practical integration in the classroom, ranging from refining literature research processes to enriching student assessment methods. Through a blend of personal reflection and analytical scrutiny, the study adeptly navigates the intricate terrain of AI implementation, showcasing the fusion of theory and practice in the era of AI.

Ethical dimensions surrounding AI tool usage are meticulously explored, underscoring the significance of upholding academic standards and addressing potential biases and ethical quandaries. The narrative accentuates AI's potential in supporting budding researchers across STE(A)M domains while advocating for a balanced assimilation that upholds the indispensable roles of educators and researchers.

As the lines between educator and researcher become increasingly blurred in the digitally-driven educational realm, this study offers invaluable insights into the challenges and opportunities ushered in by AI tools in academic milieus. By embracing a reflective and scholarly stance, the researcher lays the groundwork for ongoing improvement and professional development in the ever-evolving landscape of digital education, ensuring a nuanced comprehension of the multifaceted impact of generative AI in education.

In essence, this narrative encapsulates a young researcher's journey through a technology-rich educational and research arena, shedding light on AI's nuanced influence from both research and teaching perspectives. It serves as a testament to the evolving role of AI in education and underscores the necessity of harmonizing technological progress with ethical considerations and pedagogical imperatives.

The future of AI in education holds immense promise, spanning personalized learning, adaptive assessment, and cutting-edge research tools. As AI technologies advance, it becomes increasingly imperative to prioritize ethical considerations and provide continuous training for educators, ensuring a harmonious integration of technology into educational settings. Additionally, ongoing research is essential to address ethical concerns and foster balanced approaches, thus unlocking the full potential of generative AI in supporting aspiring researchers across STE(A)M disciplines. Through a concerted effort to uphold ethical standards and promote informed utilization, the transformative impact of AI in education and research can be maximized for the benefit of all stakeholders.

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