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AI and the future of academic writing: Insights from the ESCP Business School Prompt-o-thon workshop in Berlin

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Markus BICK, Jessica BREAUGH, Chuanwen DONG, Gonçalo PINA & Carolin WALDNER
ESCP Business School

ESCP RESEARCH INSTITUTE OF MANAGEMENT (ERIM)

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Markus Bick*
Jessica Breaugh*
Chuanwen Dong*
Gonçalo Pina*
Carolin Waldner*

ESCP Business School

Abstract

Artificial intelligence (AI) is rapidly changing academic work. This paper discusses a Prompt-o-thon workshop held at ESCP Business School, Berlin Campus, on March 7th, 2023. The event aimed to explore the impact of AI tools in academic writing, specifically for thesis writing. During the workshop students had the opportunity to use Large Language Models (LLMs) and other AI tools to write a thesis in groups on a topic that was provided to them. After experimenting with AI tools in academic writing, we discussed ethical considerations involved in their use and challenges for the future of academic work.

Keywords: Artificial Intelligence, Large Language Models, Academic Writing

* ESCP Business School, Berlin Campus

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Introduction

Artificial intelligence (AI) has the potential to revolutionize work in different fields and generate significant productivity gains. Large language models (LLMs) and other AI tools are expected to transform how academic work is conducted, particularly in relation to written assignments. GPT-3.5, for example, was launched in November 2022 and has already achieved 100 million active users in its first two months, demonstrating the widespread interest and potential impact of LLMs in various domains.

LLMs are a type of AI that use natural language processing (NLP) to understand and generate human language (e.g., Hinton et al. 2006). They have been effectively used in recognizing general speech or text (LeCun et al. 1995) and in extracting sentiment from social media posts (Dong et al. 2022). GPT-4, launched in March this year, has shown substantial performance gains, achieving human-like performance in numerous standardized tests and computer programming problems (OpenAI, 2023).

In the context of academic writing, LLMs can be used by students to generate written content at almost no cost. LLMs use large datasets of text to learn patterns and relationships between words and phrases, which allows them to generate new text that is similar in style and content to the input data. For example, an LLM could be trained on a corpus of academic papers in a specific field, and then used to generate new content for a student thesis based on a specific set of instructions. These are known as prompts. LLMs can also be used to write computer code. They are particularly useful in that they can produce programming code based on verbal prompts and explain how the code works step by step. See Korinek (2023) for a review of the use of LLMs in academic research.

The full impact of these tools on productivity is still difficult to anticipate. However, recent empirical studies have shown promising gains. For instance, Noy and Zhang (2023) found that the average time taken for completing writing tasks decreased by 37%, while average output quality, graded on a scale between 1-7, increased by 18%. Similarly, Peng et al. (2023) reported that the use of an AI pair programmer resulted in a 56% faster completion of tasks compared to the control group. For a comprehensive analysis, please see Leiter's (2023) meta-analysis.

The integration of AI tools into academic work raises important questions for both students and professors. How should students use these tools? How should professors navigate the emergence of these tools? What policies can be implemented to best use disruptive technologies while maintaining academic integrity? To explore these issues, we recently organized an event with students at the Berlin campus of ESCP Business School called a Prompt-o-thon. The event showcased the potential of AI and discussed its use in academic work. Discussions included the benefits and challenges of using LLMs and other AI tools in academic work, and the exploration of potential policies to ensure ethical and responsible use of LLMs. Given the evolving nature of these tools, universities will need to adapt their teaching and evaluation methods to keep up with the changing landscape of academic work.

This impact paper is organized as follows, the first section describes the event and how students used AI tools in their work. The second section analyzes the theses produced by the students including its academic merit, writing style and final fictional grade. The third section describes the discussion about the appropriate use of AI tools in academic writing. The final section presents concluding remarks on the use of LLMs in student work.

The Prompt-o-thon event

The Prompt-o-thon was held at the Berlin Campus on March 7th, 2023, between 9:00 am and 11:00 am. This hands-on workshop aimed to explore the use of AI tools in academic work, specifically in the context of thesis writing. Students were recruited from the compulsory Academic Writing course that is part of the Bachelor in Management. An email stating the goals and the agenda for the workshop was sent asking interested students to sign up. The first 20 would be invited to attend the workshop. A total of 56 students signed up. The demand for the workshop was very high. All 20 spots were filled within hours of the email being sent, signalling a great interest in the use of LLMs in student work. The students were placed in three working groups, with the main task of writing a bachelor thesis in 45 minutes.

During the workshop, students first had the opportunity to learn about the use of LLMs and other AI tools in thesis writing. Most students had previous experience with LLMs, further underscoring the importance of open discussions on the use of LLMs in university education. Before beginning the main task of the workshop, the teams were introduced to several AI tools, including OpenAI Playground, Poe.com, You.com, Elicit.org, and Quillbot.com. They were shown how different prompts deliver different results, and how LLMs are prone to "hallucinations", for example, making up academic papers. This introduction took about 15 minutes.

Figure 1: Student discusses appropriate use of AI tools in academic writing at the ESCP Business School Prompt-o-thon Workshop in Berlin on March 7th, 2023

After this, three teams of students worked on a thesis topic that was provided to them: “The impact of feedback on worker performance.” Teams were instructed to brainstorm their research question within this topic with the help of AI. They then divided the work among team members and brought their work together in a shared document, which they used to collaborate on and edit their findings. Students were given 45 minutes to complete the writing task. After “submitting” their work, there was a review session in which students described how they used AI tools to complete their thesis writing assignment.

During the Prompt-o-thon workshop, students employed AI in various innovative ways to streamline their thesis writing process. First, they began utilizing AI to generate a table of contents, ensuring a well-structured thesis. Second, the students used Elicit to search for relevant academic papers. As a third step, they asked ChatGPT to summarize the abstracts of papers they found, and construct a coherent literature review. After working on the literature review, one group asked ChatGPT to identify research gaps in the existing literature.

Furthermore, students used ChatGPT to develop a conceptual framework and propose a research methodology. Some used ChatGPT to simulate semi-structured interviews with managers with specific characteristics, thus generating fake data. They then asked ChatGPT to summarize these interviews and analyze the main findings from this qualitative approach. Another group generated fake quantitative data with ChatGPT on Key Performance Indicators (KPIs) for different firms related to feedback provision. To analyze the data, they requested ChatGPT to create Python code. This collaborative approach between students and AI tools highlights how students can be more efficient in their thesis writing process using these tools, but also clearly demonstrates the potential risks associated with using AI, such as concerns about the quality and integrity of academic work, including the generation of falsified data.

The next section evaluates the theses that student groups submitted. It is followed by a discussion on the appropriate use of these tools in academic work

Teachers views on the theses

The theses generated during the Prompt-a-thon were evaluated using the ESCP evaluation framework, which allows supervisors to grade theses using a standardized approach. Following this rubric and considering the very limited amount of time invested, the AI generated theses obtained 5/20 for the content and 15/20 for the format. The final average grade was 8/20, which falls below a passing grade of 10/20.

Overall, the volume of work produced by the students in such a short time was noteworthy. It was indeed surprising to see that students could conceptualize and write a professional draft in 45 minutes, which would be impossible without the support of LLMs. The theses addressed interesting research questions, identified valid research methods, and presented what looked like a comprehensive list of literature. In particular, one group presented a thesis that looked incredibly professional and polished, with a complete bibliography. This showcases the power of AI supported technology. Even though the language used was more colloquial than scientific, the English level was sufficiently acceptable for a piece of student work.

However, while some of the theses had professional appearance, they all lacked in-depth content. The summaries of the current state of research were limited and there were no clear arguments to suggest a research gap. The theses lacked critical analysis and discussion, making it challenging to understand the relevance of the topic and the

contribution of the studies. The final reference list looked professional but references from the text were missing in the final reference list. Some of the listed references were not linked to any content in the thesis, and others listed were found to be fabricated.

The question is now what would happen if students had months instead of minutes to develop and write their thesis projects. We believe that there are two possible outcomes. The first is that the student would rely too heavily on AI, and in the end, develop a thesis that contained factual errors, poor argumentation, or even completely fake information. This defeats the purpose of the thesis, which is to provide a first opportunity for students to develop their scientific methodological skills to address real-world business problems. Knowing the limitations of AI, the second outcome however, could be that students use AI generated information as a basis for their own research and analysis, and use this technology as a tool alongside traditional research approaches. To be able to spot information errors and biases, however, the students must also engage in traditional research and learning approaches. This means that AI becomes a tool rather than a replacement for students' writing and analytical abilities. For example, knowing the general literature on employee performance makes it much easier to identify where the AI technology may have gone awry. This approach is consistent with recent findings suggesting that LLM tools are a General Purpose Technology (Eloundou et al, 2023), affecting a wide variety of tasks but delivering most value for experts.

Student views on LLMs

The discussion led to several interesting results about the students' view on using LLMs for academic writing. We grouped these into two overarching questions: Why use it, and if so: how?

1. Why use it? - The benefits of LLMs: Students highlighted the potential they see in LLMs for their thesis writing. They particularly raised the point that ChatGPT and other AIs can be a useful tool for (a) inspiration for research purposes. LLMs can be used to collect ideas and insights on a certain topic, which helps students to get a better understanding of their thesis' purpose and the research gaps it can fill. AIs can also help to narrow a topic down and set boundaries if it is too broad.

Once a first overview of the topic is provided, they can also draw on AIs for a (b) preliminary literature review. As such, AI can help students to understand and summarize previous studies, and to check previous results and procedures that authors used. These might help them to find inspiration for their own thesis. Moreover, specific AI tools like Elicit could be used solely to find articles that are relevant for the topic, which not only saves time for the literature review, but also gives the students the feeling of a more holistic approach. Additionally, LLMs can help students to (c) create a structure for their research and also support students in their (d) data analysis.

Finally, LLMs can support students with (e) smaller tasks, such as summarizing their work for an abstract, or the conclusion, the style of academic writing and improving their use of language.

2. How to use it? - The risks of LLMs and how to deal with them: While students focused on the potential of LLMs for thesis writing, they came across several risks and ethical considerations too. They also provided their perspective on the appropriate use of LLMs. One of the major risks they identified was (a) the missing assurance of quality of data and information that ChatGPT and other AI-based tools provide. In several cases, the information in the theses was imprecise or plain false. It was not obvious to the students how the LLMs

retrieve data, which made them question whether it is valid and reliable. They faced this problem especially with citations and numerical data provided by the respective tool. Considering that LLMs can be a potential target of cyber-attacks, students showed reluctance in entering too much information into the tool, which in turn made the outcomes less reliable. As a way to deal with this, they suggested double checking this kind of information manually before using it in a thesis. Students were also very aware and anxious about (b) the ownership of LLM generated information, and particularly the danger of plagiarism when using such tools. Hence, they would appreciate allowing the usage of a ChatBot checker in addition to Plagiarism Checkers. However, one student highlighted the risk of false positives. A concern was that actual student work would be misidentified as generated by AI. Another risk students saw with the usage of LLMs is (c) the discrimination of certain groups based on, for example, gender, race or beliefs. To overcome this concern, students called for additional tools that help them to ensure inclusion and antidiscrimination in their thesis and to identify whether the LLM output is even reliable and objective.

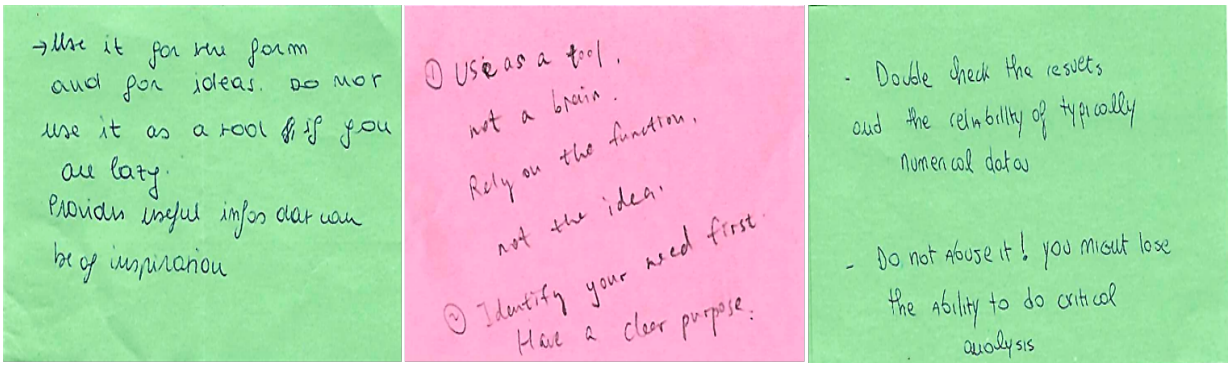

Figure 2: Examples of student contributions for the appropriate use of AI tools in academic writing from the ESCP Business School Prompt-o-thon workshop in Berlin on March 7th, 2023

To summarize, students emphasized that AI can be a valuable aid in generating ideas, understanding the research landscape, and providing structure to academic writing. However, students stressed that they must remain critical thinkers and not rely solely on AI tools, ensuring that they guide the AI and take responsibility for its output. Key suggestions include using AI as a tool rather than a replacement for human thought, having a clear goal before using an AI tool, double-checking results and data reliability, and avoiding overreliance on AI to preserve critical analysis skills.

Conclusion

Our impact paper contributes to the understanding of AI's role in academic writing, specifically thesis writing, by providing a student perspective on the benefits, functionality, and ethical considerations of AI tools. In our study, students identified risks and shortcomings, concluding that it is not yet feasible to write an entire thesis using LLMs. They recognized the efficiency LLMs can provide, but also expressed doubts about the tool's overall effectiveness. Students acknowledged the additional effort required for validating citations, ensuring correct usage, and maintaining the consistency of arguments generated by LLMs. Simultaneously, they were intensely aware of the potential risks associated with plagiarism and the generation of false information.

These insights underscore the need for clear guidelines on how to navigate LLMs in academic writing. As business school educators, our first responsibility is to offer students

and supervisors a clear orientation on handling LLMs when writing a thesis. Hence, we would like to share our lessons learnt, which can guide educators on how to use LLMs:

1) Embrace LLMs and try them out for yourself and your own work as a teacher. Create tasks or statements that students have to verify/falsify. Challenge LLMs with the results presented by the students.

2) Let the students explore the pros and cons of LLMs. Make it clear that this is a new field for everyone, including teachers and ask them to put on your shoes for a moment: how would they make use of LLMs if they were teachers? Ask students to critically evaluate the performance of LLMs. In the digital era, students can be easily overwhelmed by the vast content generated by AI and it is even more important to encourage curiosity and critical thinking.

3) Rethink traditional assignments by developing and writing assignments in a collaborative way between students and supervisors. This allows supervisors to have an eye on the students' progress. Ask students to report the steps they took to write their pieces (e.g., how did they collect the data, what were the main challenges? How did they find and organize their academic literature?)

4) Enable and drive a debate about the ethical issues and potential risks that exist (and will emerge) in the use of LLMs. Make clear how LLMs can support students, but also where the main challenges and dangers lie. Emphasize that most of the issues, such as AI-plagiarism, human-AI alignment, AI-bias, etc., must be addressed in line with ethical and social values.

5) Start to develop standards on how to use (and not use) LLMs for yourself, your team, your course, your department. Don't wait for others to come up with rules; instead, take the driving seat and co-create the rules.

Based on our own lessons learned, we have developed an initial code of conduct, drawing upon the findings of the Prompt-o-Thon and with assistance from ChatGPT. This code of conduct can be adapted and distributed by supervisors to provide clarity to students (see Appendix for details). Moreover, we recommend that business schools incorporate at least one session on LLMs in their academic writing courses, ensuring that students are well-prepared to engage with AI tools responsibly and effectively - or at least, learn about its limitations.

The Prompt-o-Thon workshop ended with an open discussion on the purpose of writing an academic thesis. As the primary goal of a thesis is to create knowledge, it is crucial to use all available tools to achieve this objective. However, it was also recognized that leveraging AI tools must be done in a correct and ethical way. This highlights the crucial role that educators and institutions play in guiding their students through changing academic environments, ensuring that the pursuit of knowledge remains grounded in accuracy, integrity, and ethical considerations.

The emergence of LLMs and AI are sure to transform education. The Berlin faculty's Prompt-a-thon workshop serves as an initial exploration into their impacts on academic writing, engaging teachers and students. Future research could expand our understanding by examining more data and investigating alternative educational activities, including innovative teaching methods and interactive grading techniques.

References

Dong, C., Bharambe, S., Bick, M. (2022). Why Do People Not Install Corona-Warn-App? Evidence from Social Media. In: Themistocleous, M., Papadaki, M. (eds) *Information Systems*. EMCIS 2021. Lecture Notes in Business Information Processing, vol 437. Springer, Cham. https://doi.org/10.1007/978-3-030-95947-0_21

Hinton, G. E., & Salakhutdinov, R. R. (2006). Reducing the Dimensionality of Data with Neural Networks. *Science*, 313(5786), 504-507. DOI: 10.1126/science.1127647

Korinek, A. (2023). Language models and cognitive automation for economic research (No. w30957). National Bureau of Economic Research.

LeCun, Y., Bengio, Y., & Hinton, G. (1995). Convolutional networks for images, speech, and time series. The Handbook of Brain Theory and Neural Networks, 3361(10), 1995

Leiter, C., Zhang, R., Chen, Y., Belouadi, J., Larionov, D., Fresen, V., & Eger, S. (2023). ChatGPT: A Meta-Analysis after 2.5 Months. arXiv preprint arXiv:2302.13795.

Noy, S., & Zhang, W. (2023). Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence. (working paper)

OpenAI (2023). GPT-4 Technical Report. ArXiv, abs/2303.08774.

Peng, S., Kalliamvakou, E., Cihon, P., & Demirer, M. (2023). The Impact of AI on Developer Productivity: Evidence from GitHub Copilot. arXiv preprint arXiv:2302.06590.

Eloundou, T., Manning, S., Mishkin, P., & Rock, D. (2023). Gpts are gpts: An early look at the labor market impact potential of large language models. arXiv preprint arXiv:2303.10130.

Appendix

Code of Conduct for Using Large language models (LLMs) and Other AI Tools to Work on Theses at ESCP Business School Berlin Campus - April 2023

At ESCP Business School Berlin Campus, we recognize the value of technology in aiding academic research and writing. However, we also value academic integrity and honesty. As such, we have created this code of conduct to ensure that students use LLMs and other AI tools appropriately and ethically when working on their theses.

It is acceptable to use LLMs and other AI tools to:

- Help you improve the clarity, coherence, and quality of your writing.
- Develop counter-arguments or ideas to help you expand your perspective and develop your critical thinking.
- Identify relevant and appropriate papers to read and cite (check references before incorporating them into your theses!).
- Review and criticize your work, so that you may further improve it.
- If you choose to use LLM and other AI tools, you are responsible for ensuring that the information that you use from LLMs and AI is accurate and relevant.

It is not acceptable to:

- Use a prompt and copy-paste the output into your paper word by word without proper attribution or paraphrasing. Doing so constitutes plagiarism and violates academic integrity.
- Use LLMs and other AI tools to generate entire sections of your paper without engaging in critical thinking or conducting original research. Doing so violates academic integrity and misrepresents your own knowledge and skills.
- Use LLMs and other AI tools to fabricate or manipulate data, including literature, interviews, survey responses, case studies, etc. for your study. All your data must be properly collected as discussed with your supervisor. If it is part of your work to generate data from LLMs and other AI tools, please specify it in your thesis.

All theses will be examined by professional tools to detect plagiarism. Unacceptable use of LLM and other AI tools will result in a failure of the thesis.

We expect all students at ESCP Business School Berlin Campus to use LLMs and other AI tools ethically and responsibly, and to adhere to the principles of academic integrity and honesty at all times. If you have any questions or concerns about how to use LLMs and other AI tools appropriately, please consult your academic advisors

By following these guidelines, students can ensure that their use of LLMs and other AI tools when working on their theses is ethical, responsible, and contributes to the advancement of knowledge and scholarship. The student has full responsibility for the content in the thesis.