Research Proposal

Background, Approach and Evidence of Experience

In recent years, Artificial Intelligence (AI) technology has advanced rapidly and is becoming a vital tool in education. As more mature AI products are introduced, students use AI in educational contexts ranging from essay improvement, code review, graphic generation, and more.[8] While the collaboration between students and AI has significantly improved students' learning efficiency, it also raises new questions, such as over-reliance on AI and hindrance to creativity.[2,9] This project aims to understand the current state of AI usage from students' perspective and investigate factors that influence students' decision-making and trust in AI and AI-generated content.

Previous studies on the application of artificial intelligence to education have found that students benefit from AI's quickness and personalized educational support.[1,3] Because of the easiness of AI tools, students might choose to extract knowledge from AI-generated content over textbooks or office hours help.[7] Students' choices and dependency on AI are crucial, especially in the time when AI is flourishing to understand how students can most efficiently extract knowledge while still holding a critical attitude and a creative mind.

Since most studies focus on AI in the art or computer science field, there is a limited understanding of how and why students in other disciplines choose and incorporate AI tools. Students' varied familiarity with AI impacts their attitudes and levels of trust in AI-generated content, and based on different study needs, students might choose different products.[4] To gain a more general, foundational understanding of the current trend of AI usage among students, this project will broadly survey students' choice and use of AI across disciplines, for example, which products they use for which kind of tasks. This survey would be sent to students in several higher education institutions including Smith, and potentially high schools as well to acquire a broader range of perspectives.

In addition, hallucination is a well-documented phenomenon in artificially-intelligent systems, and available training on the critical and ethical use of AI is lacking.[5] Given the variability in AI proficiency, factors that influence students to trust or accept AI-generated content vary. Therefore, this project might conduct qualitative interviews and experiments to compare and contrast how students with different educational backgrounds evaluate AI and AI-generated content, both objective ones (e.g., math) and subjective ones (e.g., art). For example, what do they care about when using AI, how do they decide if AI-generated content is credible, and how do they balance efficiency and academic integrity. This part of the project seeks to qualify factors that students care about the most when seeking knowledge, and aspects they benefit from the most by leveraging AI so that we can identify ways to incorporate AI in students' studies while reducing potential misuse.

Insights into these two questions– 1) the trend of AI usage among students with different backgrounds and 2) factors that influence their levels of trust– can help evaluate the impact of AI in education from students' perspectives, so as to reflect on our current education of AI usage across institutions. The endpoint of this project would be a policy review to identify and suggest areas where institutional guidance regarding the ethical use of AI and student perceptions/behavior are misaligned.

Timeline

The initial phase is an extensive literature review, which was completed in Summer 2024 as evidenced by the research proposal and bibliography. Following this, the initial study design will be developed and submitted to the IRB in September. From October to November, qualitative interviews will be conducted as part of Study 1 to understand the general perspective of what students say matters to them. We will design and implement browser extensions based on insights and observations from Study 1 between December 2024 and January 2025, during which the initial thesis writing will start. From February to March, Study 2, focused discovery exercises, will take place using the browser extension to investigate how priming/nudging (e.g., a reminder of citation or low-effort interventions) affects student behavior and sentiment when using AI tools. Eventually, the thesis writing will be completed in April 2025 as the conclusion of the project.

Relevant Preparation

As a CS and Art History double major student, I have developed interdisciplinary skills that will benefit the cross disciplines part of this project where we seek to build a more general understanding of students' AI usage. Secondly, I will be taking an HCI course along with this project to ensure I can apply best practices in HCI studies, especially in survey design and qualitative interviews. Lastly, I am passionate about research and have consolidated my lab skills like time management and scientific writing through my SURF experience last year. I am confident that I can follow along the research plan and conduct meaningful research under the guidance of my supervisor in this thesis project.

Bibliography

[1] R. Silvano and A. Gui, "Factors that Influence College Students in the use of ChatGPT in Indonesia," 2024 28th International Conference on Information Technology (IT), Zabljak, Montenegro, 2024, pp. 1-4, doi: 10.1109/IT61232.2024.10475770.

[2] X. Chen, F. Yang and W. Yu, "The Willingness of College Educators in Animation and Digital Media to Embrace Generative AI," 2024 13th International Conference on Educational and Information Technology (ICEIT), Chengdu, China, 2024, pp. 18-23, doi: 10.1109/ICEIT61397.2024.10540881.

[3] Chassignol, M., Khoroshavin, A., Klimova, A., & Bilyatdinova, A, “Artificial Intelligence trends in education: a narrative overview", Procedia Computer Science, 2018, 136, 16-24.

[4] X. Chen, Y. Liao and W. Yu, "Generative AI in Higher Art Education," 2024 6th International Conference on Computer Science and Technologies in Education (CSTE), Xi'an, China, 2024, pp. 135-140, doi: 10.1109/CSTE62025.2024.00032.

[5] Luckin, R., Cukurova, M., Kent, C., & du Boulay, B, “Empowering educators to be AI-ready. Computers & Education:Artificial Intelligence”, Article 100076, 2018

[6] H Singh, M H Tayarani-Najaran and M. Yaqoob, "Exploring Computer Science Students' Perception of ChatGPT in Higher Education: A Descriptive and Correlation Study[J]", Education Sciences, vol. 13, no. 9, 2023.

[7] S. Hirabayashi, R. Jain, N. Jurković, and G. Wu, “Harvard Undergraduate Survey on generative AI,” arXiv.org, https://arxiv.org/abs/2406.00833

[8] Maria Ijaz Baig and Elaheh Yadegaridehkordi, “ChatGPT in the higher education: A systematic literature review and research challenges,” International journal of educational research, vol. 127, pp. 102411–102411, Jan. 2024, doi: https://doi.org/10.1016/j.ijer.2024.102411.

[9] Kasneci, E.; Sessler, K.; Küchemann, S.; Bannert, M.; Dementieva, D.; Fischer, F.; Gasser, U.; Groh, G.; Günnemann, S.; Hüllermeier, E.; et al, “ChatGPT for good? On opportunities and challenges of large language models for education”, Learn. Individ. Differ. 2023, 103, 102274