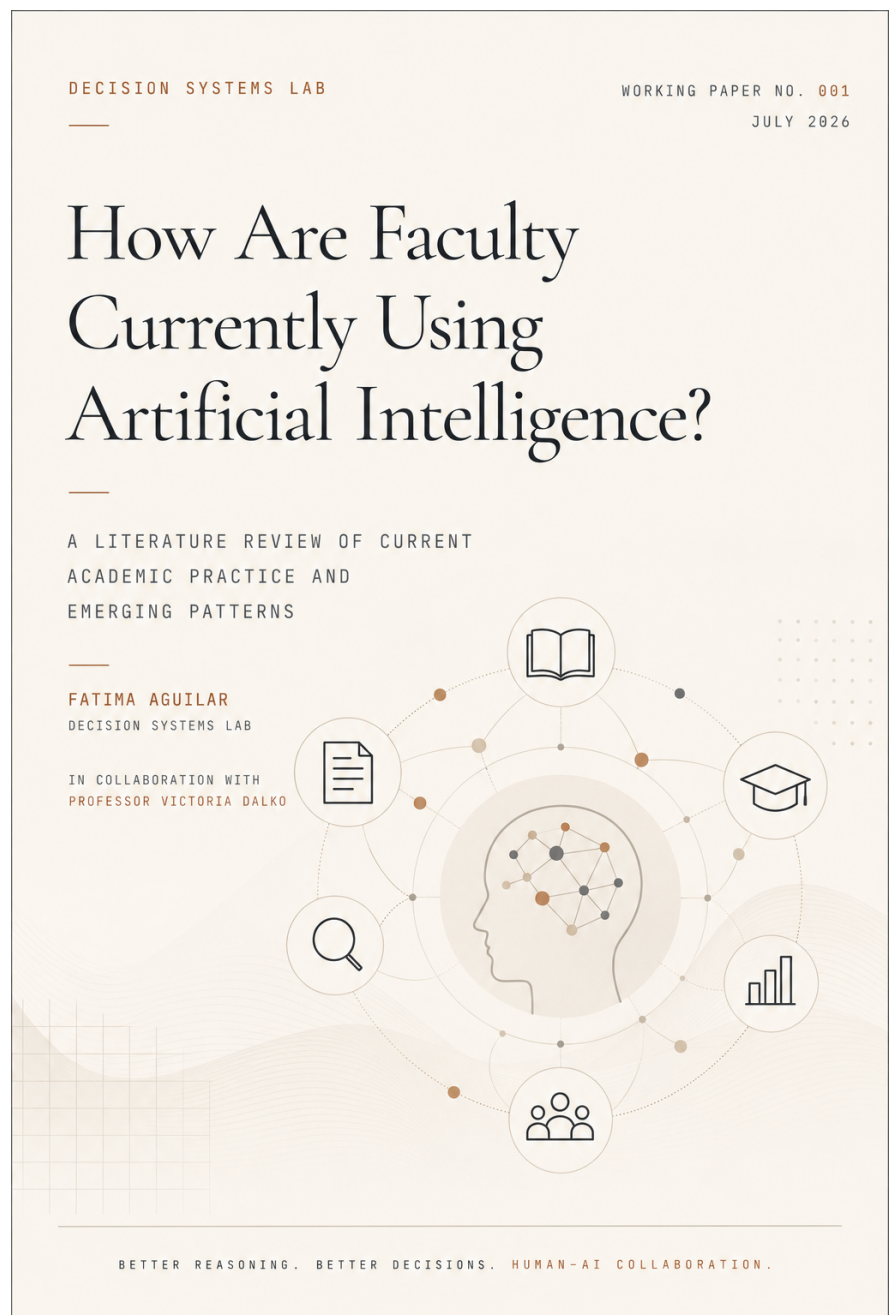


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How are Faculty Currently Using Artificial Intelligence?

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Artificial intelligence has rapidly become a part of higher education, yet there isn't as much research out there examining how faculty are incorporating AI into teaching, research, and scholarly work. While direct studies of faculty behavior remain limited, a growing body of literature examining doctoral education, research collaboration, and academic workflows provides insight into the evolving relationship between faculty and artificial intelligence. This literature review synthesizes findings across recent empirical and conceptual studies to investigate how AI currently functions within advanced academic environments



Abstract

In this literary review, four recurring themes emerge: AI is primarily adopted as a supplement to faculty expertise rather than a replacement (Grote et al., 2024; Oliveira et al., 2024), it increasingly serves as an individualized learning scaffold (Grote et al., 2024; Oliveira et al., 2024) that complements expert instruction, recent evidence suggests that AI is beginning to function as a collaborative reasoning partner (Dell'Acqua et al., 2025) capable of participating in knowledge work, and persistent concerns surrounding ethics, academic integrity, transparency, and institutional governance continue to shape adoption (Ren et al., 2025; Grote et al., 2024).

Collectively, these findings suggest that AI is transforming academic work not by replacing faculty judgement, but by augmenting human expertise while preserving the central role of scholarly reasoning (Grote et al., 2024; Dell'Acqua et al., 2025).

Introduction

The importance of understanding the consequences, opportunities, and gaps in the adoption of AI in higher education lie in the fact that artificial intelligence is becoming a part of the shaping of future researchers, professors, and high level professionals across all fields (Grote et al., 2024; Oliveira et al., 2024). Understanding how the adoption of this technology is helping shape the minds of tomorrow is essential to our understanding of what that future will look like, and how, in these early adoption stages, we can make changes to the way AI is implemented with the purpose of teaching researchers and high level graduate students, what are the optimal ways in which this technology can be responsibly implemented into their current, and future, research projects (Oliveira et al., 2024).

Faculty are an integral part in how students adopt technologies into their work. Plenty of students have said that they are afraid of adopting AI into their work because some of their professors are all for AI and others stand against it warning over the possibility of excessive reliance on these technologies, and the possibility of losing critical skills (Ren et al., 2025). On the other hand, students with professors who promote AI usage felt confident in their work and cited feeling more productive when it comes to deadline achievements (Ren et al., 2025). Students look to faculty for guidance on whether technologies are beneficial to their work (Ren et al., 2025).

Current literature speaks on qualitative data gathering for adoption implementation, the role of faculty in implementation, and the fears, concerns, as well as excitement when it comes to the students, yet it doesn't touch on whether these technologies are helping the cognitive processes of learning or not (Grote et al., 2024; Oliveira et al., 2024; Ren et al., 2025). The focus is centered around the implementation in higher education under the assumption that it creates an environment that promotes excessive reliability on the technology and that it might hinder the critical skills of the students, yet there isn't literature surrounding the topic of the invisible side of learning. What is happening to the cognitive abilities of the students engaging in AI technologies, how are their learning processes changing, and how are the measurable results being affected?

For this literature review, we will be exploring the following question:

How are faculty currently using artificial intelligence, and what role does AI occupy within advanced academic environments?

AI as a Supplement to Faculty Expertise

In the research paper *“Artificial Intelligence in PhD Education: New Perspectives for Research Libraries”* and in *“Exploring the Adoption Phenomenon of Artificial Intelligence by Doctoral Students within Doctoral Education”* the researchers explored questions surrounding the implementation of AI, already occurring, in doctoral programs. Amongst the results reported both papers, a pattern began to emerge: AI is being implemented as a bridge between the student and the faculty's knowledge outside of the classroom.

PhD students are utilizing AI tools to help in their literary searches by asking it to perform tasks such as writing up a list of the most recent papers published on a certain topic. Once their papers are in the process of being written, they go ask AI for help in drafting the structure of their papers, or asking it to edit their ongoing work. When it comes to data, students are implementing AI technologies in statistical and qualitative analysis, as well as data visualizations. In earlier stages of thesis or research writing, students are engaging with AI to brainstorm ideas on what to research next, or brainstorm next steps on their current body of work (Grote et al., 2024; Oliveira et al., 2024).

In an era pre-AI, students were going to their faculty to engage in these activities with them, now they are finding the ubiquitousness of AI as a solution to these needs.

AI as a Tutor and Learning Scaffold

For students engaging in graduate programs, the learning process is continuous from beginning to end of day. One of the current implementations of AI in doctoral programs is to utilize it as a tutor outside of the classroom. Whenever there is a difficult concept that needs to be defined, students engage with AI to bridge their knowledge gap. When it comes to working on their research, they ask AI for immediate feedback, as well as brainstorming sessions, idea structurization, and grammar checks (Oliveira et al., 2024).

Outside of the classroom, doctoral level students are also applying AI as a self-regulated learning tool. Online courses are also currently offering AI as a self-regulated learning tool embedded in the learning platforms (Grote et al., 2024). The purpose is to give students the option to ask questions as they revise their notes, or practice their current skills by asking AI to generate similar problems related to the content the student just learned. This is specifically applied in qualitative courses. Similarly, PhD students are utilizing AI to help themselves put into practice the concepts they have just learned, or ask further questions on related topics that otherwise would have to wait to be asked in a classroom or during office hours (Oliveira et al., 2024).

AI as a Collaborative Reasoning Partner

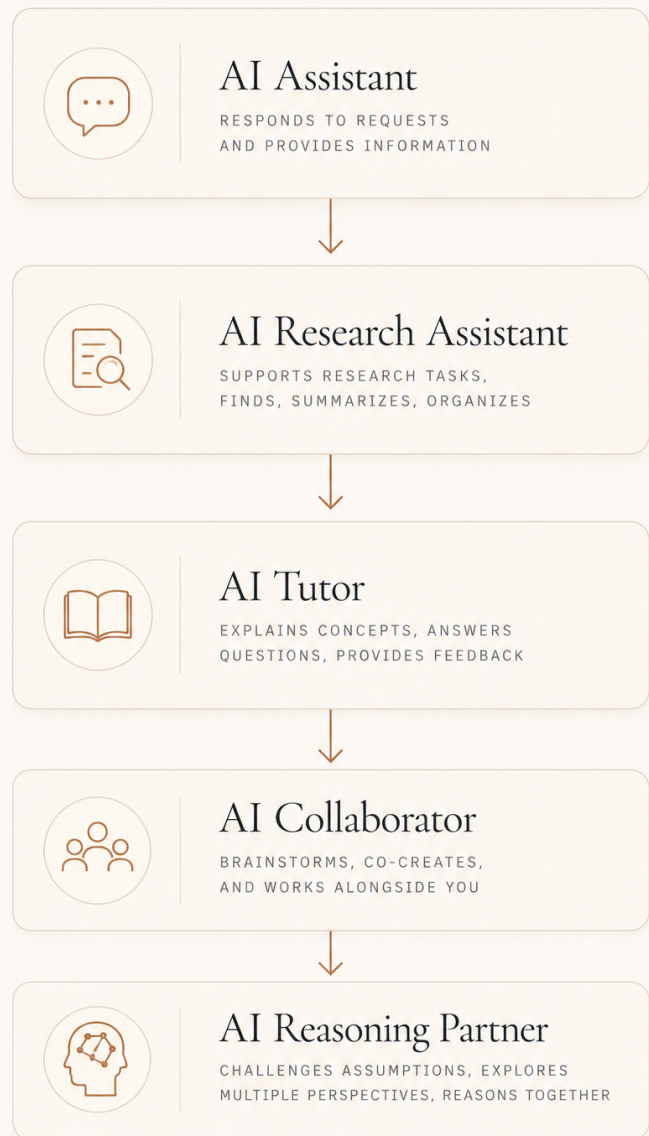
During a review of “*The Cybernetic Teammate*” research paper a overarching theme began to form for this specific research project: AI could be implemented as a collaborator who is capable of participating in human problem solving, but not replacing human judgement.

In this research, a number of P&G employees received training on how to utilize AI including prompting, collaborating, brainstorming, etc... They were then assigned to different groups:

- control: individual without AI
- Treatment 1 (T1): Team without AI
- Treatment 2 (T2): Individual with AI
- Treatment 3: (T3): Team with AI

(Dell'Acqua et al., 2025)

The goal was for the participants to work through the product development process and create a seed idea that struck a balance between technical and commercial ability with or without AI depending on which group they were assigned.



Some of the findings in this paper that stood out the most are:

- Individuals working with AI performed similarly to teams working without AI
- AI broadened access to expertise
- AI reduced functional Silos
- Participants produced more balanced results
- Productivity increased while completion times decreased
- Emotional responses were comparable to emotions produced by human collaborations.

These findings are fascinating since they have been tested in the work environment, but not yet applied to the academic world. How does AI affect the learning outcomes of students in individual and group settings? What is the best way to apply AI in academia? In the classroom? Outside the

classroom? And what is the long term effect? Will it promote long term learning? Help students gain knowledge that can be tested through exams? Or does it give the student enough information in the moment to bridge a knowledge gap in order to achieve a goal, but the learning process is not really happening?

Persistent Faculty and Institutional Concerns

The main topic of discussion connecting the collection of research papers utilized in this literature review is the concern that faculty share over AI integration in academia (Grote et al., 2024; Oliveira et al., 2024; Ren et al., 2025). There is also concern being expressed by institutions and there are several common threads amongst these papers. The most pressing concern being that of academic integrity (Ren et al., 2025). When institutions and faculty are not expressly stating what is plagiarism, and what isn't, it is easy for the students to feel like there is a fine line that they could easily cross without meaning to.

Faculty are concerned with students utilizing the tools inappropriately and with institutions not placing strict guidelines on what is permissible and what isn't. They are also putting into question what is informational and what is a hallucination (Grote et al., 2024). Faculty are concerned that students might be writing about what they think is factual information, but might have been a hallucination.

Then come the concerns with data governance, transparency, copyright, and data privacy (Grote et al., 2024). For someone who is researching, data is incredibly important, and it might feel great to have it at the palm of one's hand by asking an AI tool to provide said data, yet the provenance of the data is hard to know. If it is in fact a real data set, where did it come from? Is the researcher allowed to use it for their research purposes?

This concern could have legal ramifications on published work, which also causes hesitancy to adopt the tools. These concerns all call for better policies around AI and what the tools are allowed to provide to its users, as well as university policies that help guide students and faculty through knowing what is acceptable use of AI.

Discussion

Collectively, the literature suggests that AI adoption has progressed through identifiable stages (Grote et al., 2024; Dell'Acqua et al., 2025). Early applications

focused primarily on productivity gains, while more recent work shows collaboration between humans and AI systems. The literature is also pointing at the fact that faculty are adopting AI selectively and currently utilizing it for certain research support, writing assistance, coding, data analysis, administrative efficiency, and personalized student support. It is a tentative adoption of AI, yet still moving at a rapid pace with new tools being introduced to market on a daily basis (Grote et al., 2024; Oliveira et al., 2024).

Education for these AI tools is scarce in educational environments as well. The literature highlights a lack of educational curve happening amongst faculty, specially within the groups who are skeptical on the use of AI as part of research efforts (Grote et al., 2024; Ren et al., 2025). This is also limiting the exposure of students under the instruction of said faculty to AI capabilities, which feeds into the loop of hesitation in students to engage with the tools.

Research Gap

In the research paper “Navigating Cognitive dissonance: Master’s students’ experiences with ChatGPT in dissertation writing” the researchers put together a selective coding model in which subjective norms and technological expectancy drove the student’s use of ChatGPT for thesis writing, yet this positive ideal is challenged by low tool efficacy and the perceived risks which prompted most students to consider alternatives. External pressures and usage barriers, such as a lack of education on the tools, creates a cognitive dissonance (Ren et al., 2025). This model provides an explanation for how lack of education on the tools being implemented discourages faculty from promoting the tools and, therefore, students from wanting to adopt them, since it is easy to presume that faculty share a similar model to the one described above. Education on the tools at an institutional level is key in order for AI to be better adopted by faculty in PhD programs.

This could also be the key to fostering an environment in which students can discern what the correct usage of the tools are. The question is whether promoting these tools is what is best in a higher education environment. We do not yet have concrete answers on whether the knowledge gap that AI can bridge in an instant has a long lasting term in the learning journey of students, or if it robs the students from the experience of learning while doing. It is time efficient, it does help create better results in team and individual work, yet does it add as much value in the educational environment as it does in the work environment?

Implications for Future Research

One promising direction involves investigating how AI and faculty can engage in collaborative reasoning rather than task automation alone. Future research may examine frameworks capable of structuring dialogue, preserving multiple perspectives, and supporting scholarly judgement throughout the research project promoting learning along the process instead of applying AI as a tool that provides the researcher with the answers, it could be useful to create AI tools that act as a partner to the researcher and its main goal is to pose questions, prompt brainstorming, and guide through the research process without directly providing answers to the questions being asked. It could also be useful to create a tool that is more likely to challenge the work of the student, instead of the AI agreeing with the student 51% of the time, which is the current statistic of how like chatGPT is to agree with a person regardless of whether they are right or wrong (Dell'Acqua et al., 2025).

Conclusion

The evidence reviewed across advanced academic environments consistently suggests that artificial intelligence is augmenting, not replacing, faculty expertise. Rather than diminishing the role of professors, AI implementation across institutions is highlighting the key role that faculty play in the adoption of technology by students, and the outcomes of tools being implemented. AI appears to be reshaping scholarly work by automating routine cognitive tasks while increasing the relative importance of mentorship, critical evaluation, ethical judgement, and interdisciplinary reasoning (Grote et al., 2024; Oliveira et al., 2024; Dell'Acqua et al., 2025). As AI capabilities continue to evolve, the central question no longer is whether faculty should use AI, but how humans and AI can reason together most effectively.

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