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Real Life Mentoring in an Artificial (Intelligence) World

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Productive interactions between academic mentors and their doctoral mentees rely on a foundation of trust. The rapid development of artificial intelligence (AI) paired with increasing levels of responsibility and expectations for faculty has the potential to influence this foundation. Will AI erode the traditional relationship between academic mentors and mentees, or can it be used to enhance collaboration, teamwork, and trust?
Research on AI is nascent. As the technology behind and software applications of artificial intelligence evolve rapidly, the ethical and moral aspects of how AI becomes embedded within academia are less clear. We believe that by elevating this discussion, particularly in terms of how this tool can integrate into mentorship and academic advising, mentors will be better equipped to 'ride' the AI wave and enhance their mentoring. Between the introduction of new large language models (LLMs), the arrival of agentic AI models, and the specific use case AI models being created (voice, embedded into existing tools, etc.), it is impractical to assess AI accurately today, as tomorrow's reality will be different. Establishing baselines and applying conceptual frameworks to integrate these models into our work will serve the needs of mentors in a more cohesive manner. Through the development and application of a conceptual framework to guide mentors in navigating the ethical, moral, and operational questions posed by the rapidly evolving AI space, we believe that the mentor-mentee relationship will be strengthened and streamlined.

Keywords: AI, artificial intelligence, mentoring, doctoral advising

Introduction

It would be difficult to find a more popular topic in education than the impact of artificial intelligence (AI) on student learning. Whether used to personalize learning in early grades, assist with accessibility issues in middle school, or challenge high school students through curated cases and chatbots, AI has become an integral part of K-12 education (Martin et al., 2023; Yim & Su, 2024). Similarly, higher education faculty members have grappled with the most effective way to utilize AI tools to enhance pedagogy and student learning (Bond et al., 2024).

Literature Review

While current attempts to integrate AI usage are certainly novel, the use of artificial intelligence to enhance classroom learning has a decades-long lineage in the United States. From the use of so-called "teaching machines" in the Progressive Era to computer-assisted learning in the middle and late 20th Century, the use of something akin to an artificial intelligence in educational settings is not new (Cope & Kalantzis, 2023). However, the capability and reach of current AI applications has never been more powerful; in 2019, large language models (LLMs) were trained on ~0.09 billion parameters (Lucas, 2024) — OpenAI's most advanced model as of publication, GPT-4, is estimated to have been trained on ~1.8 trillion (Heaven, 2025). As AI development continues to rapidly advance, applications across higher education will likewise continue to increase; one such area that we anticipate disruption to occur within is academic mentoring.

Whether the teacher is Aristotle, Socrates, Plato, or a modern-day university professor, the tutelage provided by teachers to their students is of paramount importance. While faculty members advise students in associate's, bachelor's, and master's degree programs, the nature of the doctoral process, with its focus on the promotion of a new contribution to the field, necessitates a more in-depth and intentional kind of relationship between mentor and mentee. This relationship has traditionally been built the 'old-fashioned' way: through edits and conversation, critiques and collaboration, and ultimately, a successful defense and conference of a degree. However, as is the case in many other facets of our society, the relentless carousel of progress turns, and AI is rapidly becoming variously a tool, issue, challenge, and/or benefit to the process of the dissertation and, in turn, to the mentor/mentee relationship.

Sensemaking is a crucial component that leaders and organizations must employ to address the complexities inherent in the modern world. As academic mentors, it is incumbent upon us to rethink our approach to mentoring doctoral

students and to sensemake how (or whether?) AI fits. The tragedy of the Mann Gulch fire has become a familiar and oft-referenced vignette within the canon of organizational behavior. A crew of smokejumpers was dropped into Mann Gulch with the expectation that they would be fighting a moderately sized fire; however, they quickly realized that the moderately sized fire they were expecting was, in fact, an extremely fast-moving and aggressive fire. In the heat of the moment, their foreman, Wag Dodge, did something unexpected; he lit an 'escape fire,' jumped into the ashes that were left, and was able to survive as the main fire raged around him (Weick, 1993; MacLean, 1992). While Wag was able to survive, the surrounding organization collapsed. Whereas he was able to uniquely sensemake the situation, no other crew members joined him in his escape fire, and only two others survived the fire.

Method/Program/Project

In the realm of academic mentoring, what is our escape fire? How can we ensure that our work remains stable as we navigate the inherent uncertainties posed by the creep of AI? How can we sense- make what could be from what is there? As AI continues to develop, the prospective impacts of how artificial intelligence can intersect with both the process of the dissertation and the relationships between the mentor and student are vast (and likely, still not fully grasping what the future may hold). Moore's law postulates that computing power doubles — while the cost halves — every two years (Dyatkin, 2021). Up until 2009, AI model training compute doubled roughly every 21 months, from 2010-2022 the average doubling time decreased to only ~5.6 months (Sevilla et al., 2022, p. 3). While billions of dollars are being invested in LLMs and their training for AI (Kindig, 2024), college and university faculty are frequently being tasked to do more with less (Akiba & Fraboni, 2023). This creates a paradox: if AI is getting smarter and more capable and faculty members are being stretched more thinly, can AI take up the slack? Should we 'allow' it to fill this vacuum? Can we chart a path forward in the context of the rapid development of AI that also preserves the traditional relationship between mentor and mentee? Our hope in this conceptual paper is to do just that: by sensemaking how mentoring may look in the future, recognizing the rapidly changing environment, and grounding ourselves in the more acute purpose of doctoral studies and advising, we aim to support faculty members with a framework that will best engage and develop their students.

Academic mentoring exists at all levels of education, but it plays a particularly vital role in the completion of a doctoral degree. Finishing a terminal degree usually involves components beyond simply completing coursework, including the production and defense of original scholarship and the successful completion of comprehensive examinations. These novel activities demand guidance from a trusted mentor who can help "make implicit elements of the curriculum explicit" and help blunt student attrition: "A relational connection between a doctoral advisor and advisee mitigates program attrition, and supports degree completion" (Reis & Grady, 2020, p. 137).

Beyond fostering a relational connection and helping students navigate hidden complexities, doctoral advising entails multiple demands. Interestingly, in their work studying doctoral supervision across 116 countries, Guarimata-Salinas and colleagues (2024) delineate 18 unique functions — or supports — that doctoral supervisors typically provide to their students. These functions span from practical tasks like "reporting" or "communicating and sharing the progress and results of the research with the doctoral candidate and other stakeholders," to more nuanced activities like "caring" or "showing concern and attention towards the doctoral candidate's academic and emotional wellbeing during the research process" (p. 1324). Below, we have reproduced the battery of advisory functions noted by Guarimata-Salinas et al. (2024) to highlight the dynamic demands of this position.

Figure 1
18 Functions of Doctoral Support

To supervise	To promote
To direct	To instruct
To guide	To train
To lead	To boss
To manage	To consult
To advise	To report
To mentor	To rule
To care	To conduct
To sponsor	To tutor

Although the above tasks are inherently "human," artificial intelligence has an opportunity to affect the nature and quality of each support function. Make no mistake, these functions will not disappear but will likely be impacted by current and future developments in AI. Impending shifts in how these activities occur highlight the need for implementation perspectives to maximize AI's utility while minimizing potential negative impacts along the way.

Results & Discussion

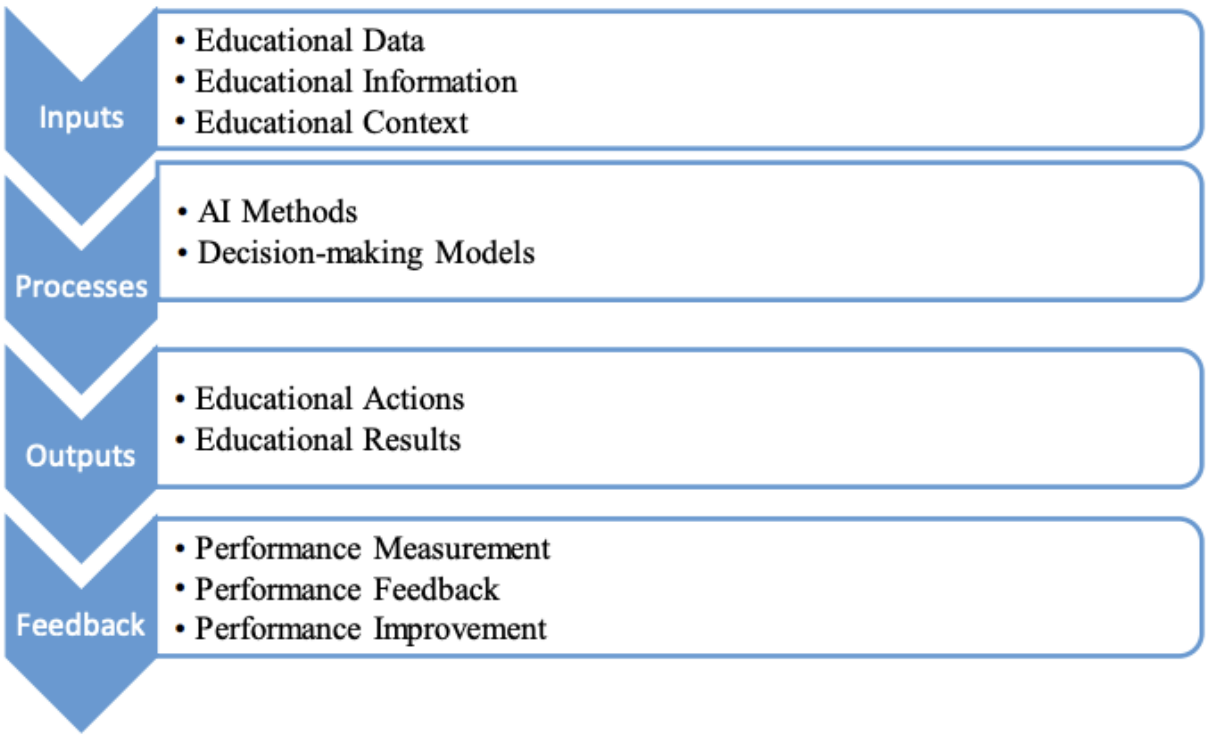
With these shifts in mind, we return to our guiding purpose of this paper: establishing a workable framework for integrating AI into doctoral student advising. The traditional ethical dilemmas posed by the dissertation process were relatively narrow: cite sources appropriately, do not plagiarize, and do not "fudge" data. While these remain considerations, the additional ethical dilemmas posed by the integration of AI are substantial. There also exists a tension between guarding the efficacy of current practices and the potential time and efficiency savings of AI integration. Said differently, when should faculty members replace or update existing practice in favor of new, AI-enhanced methods? These dilemmas underscore our conviction that it is prudent to adopt a durable framework that supports faculty, regardless of the specific AI tool under examination.

Holmes et al. (2022) note that AI in education needs to specifically address the following issues: the purpose of the learning, the choice of the pedagogical approach taken, the role the technology plays for the teacher, and how it ultimately impacts access to education (p. 5). Applying these framing concepts to the academic advising relationship is a starting point for establishing a baseline of ethics for the integration of AI. Establishing an "actionable code of best practice" (Holmes et al., 2022) at the university, school, and/or department level will prompt stakeholders to assess the implications of AI for their practice.

One such practical application of an ethical framework is known as FATE - Fairness, Accountability, Transparency, and Ethics (Memarian & Doleck, 2023). The FATE model seeks to critically review AI for its biases in its training or responses (fairness), the degree to which outputs are rooted in fact and not hallucinogenic in nature (accountability & transparency), and that attribution/application of AI is done in an ethically sound manner (Memarian & Doleck, 2023).

Langeveldt's (2024) conceptual model is rooted in AI theory, leadership theory, and decision-making theory as a mechanism to support educational, AI-driven decision-making (see Figure 2). While this model is expressly framed around AI-driven decision-making approaches, there are parallels to the doctoral supports noted by Guarimata-Salinas et al. (see Figure 1 above). Each of the traditional supports provided within doctoral advising fits within Langeveldt's conceptual model.

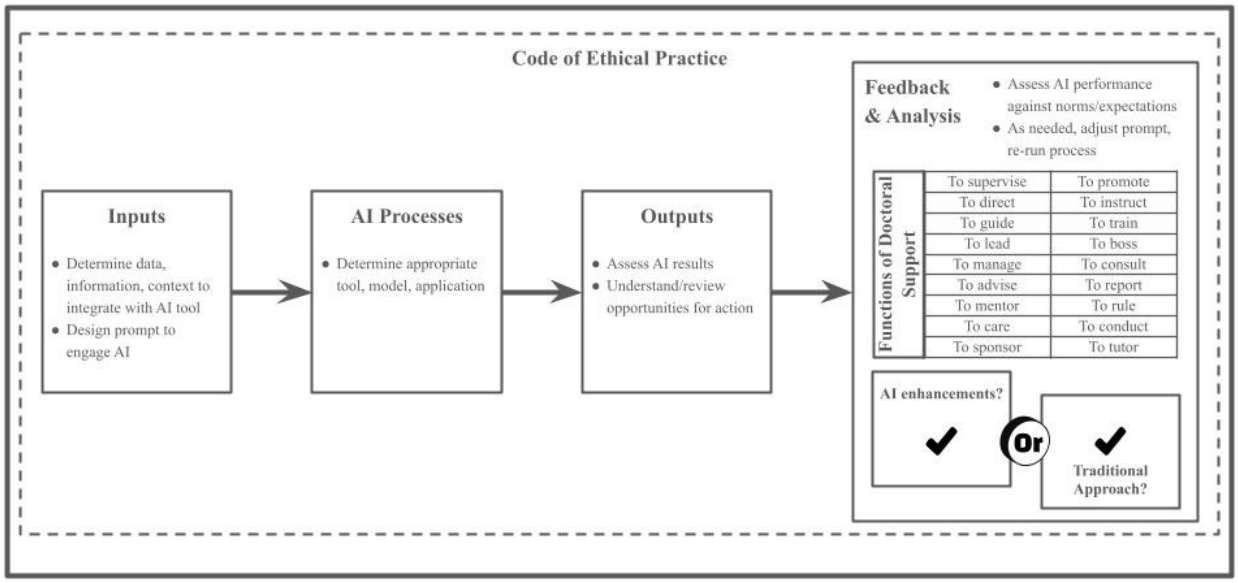
Figure 2
Langeveldt's Conceptual Model



Note: Langeveldt's (2024) conceptual model as depicted on p. 1588 in the source text.

Built upon a foundation of a mutually agreed-upon, collaboratively constructed, and locally developed code of ethical practice, our conceptual model for integrating AI into doctoral advising proactively frames engagement, regardless of the complexity or sophistication of future AI. Melding the decision-making theory of Langeveldt with Guarimata-Salinas and colleagues' doctoral supports creates synergy between the traditional actions of doctoral advisors and the modern AI-driven approaches available to faculty. Lastly, a key (perhaps the key) consideration that faculty must make as they integrate AI into their practices is to ask the question: "Are these AI enhancements better than my traditional approach to advising, or not?" No tool or application should replace the expertise and judgment of a doctoral advisor, and there will undoubtedly be instances where "new" is not inherently better. It is incumbent upon faculty and students alike to understand the limitations of AI tools and to not be afraid to find an appropriate balance between leveraging technological advances vs. holding fast to their professional expertise.

Figure 3
AI Integration in Advising Conceptual Framework



Conclusion

As leadership and faculty continue to grapple with how to best integrate AI applications within their coursework and mentorship, one thing is certain: AI is here to stay. The primacy of the mentor-mentee relationship within doctoral coursework will undoubtedly be tested and evolve in the years to come, but these relationships remain as critical as they have always been. Rather than viewing AI as a threat or inhibitor to successful mentorship, we believe that the thoughtful curation and use of AI has the potential to produce benefits for faculty and students alike.

Our emergent conceptual framework offers leadership and faculty members a flexible and realistic approach for evaluating the potential applications of new AI technologies. In advancing this framework, we do not advocate for the automatic adoption of new tools without careful scrutiny and trial and error. Within improvement work, there exists a touchstone widely attributed to W. Edwards Deming: "It is not necessary to change. Survival is not mandatory." This sentiment serves as a cautious warning for those seeking to innovate and adopt new practices, especially as AI continues to grow more sophisticated. We must endeavor, as a field, to work with AI, not against or without it.

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