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The Transformative Potential of Artificial Intelligence in Interdisciplinary Studies Curriculum and Programs

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Abstract: *Artificial Intelligence (AI) is reshaping higher education at a pace and scale that challenge long-standing assumptions about how knowledge is created, taught, and learned. Interdisciplinary studies programs—designed to cross traditional academic boundaries and to cultivate integrative, context-sensitive thinking—are particularly well positioned to engage with AI as both a tool and an object of inquiry. AI now influences research methodologies, curriculum design, assessment systems, and the organization of academic labor. Scholars have documented its role in enabling large-scale data analysis, new forms of computational research, and personalized learning pathways that can respond to students' diverse interests and backgrounds (Alpaydin, 2020; Kelleher et al., 2020; Zhu & Chen, 2025). At the same time, there is growing concern about algorithmic bias, inequitable access, opaque decision-making processes, and the risks of over-reliance on automated systems in educational contexts (Baker & Hawn, 2022; Holmes et al., 2022; Yin et al., 2024; Xie et al., 2025).*

This paper argues that AI, when approached with critical awareness and intentional design, can substantially advance the goals of interdisciplinary studies. It can enable richer collaboration across fields, expand the methodological repertoire available to students and faculty, provide more flexible and responsive learning experiences, and foreground pressing ethical and social questions. The discussion that follows examines AI as a catalyst for interdisciplinary collaboration, as a driver of dynamic curriculum design, as a foundation for personalized learning in interdisciplinary contexts, and as a subject of interdisciplinary study in its own right. The paper also addresses the ethical, institutional, and equity-related challenges that must be confronted if AI is to enhance rather than erode the core values of interdisciplinary education.

1. INTRODUCTION

Interdisciplinary studies emerged in higher education as a response to the realization that many of the world's most significant problems do not map neatly onto the borders of academic disciplines. Climate change, global migration, structural racism, technological disruption, and public health crises are not exclusively "scientific," "political," or "cultural" issues. They are compound, evolving phenomena that require perspectives and methods from multiple fields if they are to be understood and addressed meaningfully. Bearman et al. (2020) describe how the explosion of data about social and environmental systems has exposed the limitations of narrow disciplinary lenses and highlighted the need for integrated approaches that recognize how economic, technological, ecological, and cultural dynamics interact.

AI intensifies this need for integration because it simultaneously produces new kinds of data, new tools for interpreting that data, and new questions about what counts as knowledge. AI systems are now embedded in everything from social media and banking to logistics, transportation, and scientific discovery. Laney (2021) and Viardot et al. (2024) note that AI is not simply an add on to existing practices; it is changing the underlying structures of how information is generated and evaluated. For universities, this means that AI is not just a technical resource but a fundamental shift in the knowledge environment in which teaching and research take place.

Interdisciplinary studies offer a particularly fertile context for engaging with AI because they begin from the premise that no single perspective is sufficient. They encourage students to read widely, to compare frameworks, to consider the value and limits of quantitative and qualitative evidence, and to reflect on the social and ethical dimensions of knowledge. These habits of mind align closely with

emerging calls for deeper learning and epistemological pluralism in AI-enhanced educational environments (Dede, 2014). Integrating AI into interdisciplinary studies, therefore, is not merely about adding a new topic or technology, but about rethinking how the goals of integrative education can be pursued more ambitiously in a world where AI systems play an increasingly central role.

2. AI AS A CATALYST FOR INTERDISCIPLINARY COLLABORATION

AI has already demonstrated its power to transform how researchers collaborate across disciplinary lines. One of the clearest examples can be found in computational social science, where scholars use AI-based tools to analyze massive datasets on human behavior, including social media interactions, mobility patterns, demographic trends, and economic indicators to explore questions that would have been unmanageable using traditional methods alone (Macanovic, 2022). In such projects, computer scientists work alongside sociologists, economists, psychologists, and political scientists, each contributing a different form of expertise to the design and interpretation of models.

In the digital humanities, AI driven text mining and image recognition tools have allowed researchers to analyze thousands or even millions of documents, artworks, and historical records, revealing patterns that offer new insights into cultural history, literary form, or visual representation (Ruecker et al., 2011; Stoltz & Taylor, 2023). For example, AI may be used to track how metaphors for illness change across genres and centuries, or how visual motifs in art correlate with political events or technological innovations. These kinds of studies are deeply interdisciplinary because they require not just technical competence in machine learning but also careful attention to historical context, interpretive nuance, and theoretical framing. What makes AI particularly potent as a catalyst for collaboration is not simply its computational power, but its capacity to provide a shared methodological space. Researchers from different disciplines can gather around the same dataset or model and ask different questions, contributing distinct interpretive frameworks. AI-driven research platforms support this by helping scholars discover relevant literature outside their home disciplines, propose unexpected connections among concepts, and organize diverse forms of data into coherent analytical workflows (Zawacki-Richter et al., 2019).

Equally important is the way AI can lower traditional barriers to interdisciplinary participation. Long and Magerko (2020) suggest that AI literacy and understanding what AI systems can and cannot do, how they are trained, and how their outputs should be interpreted—is becoming a foundational competence, much like basic numeracy or digital literacy. As user-friendly tools and interfaces spread, students and faculty from fields historically distant from computation can begin to use AI to support their own research and teaching without needing to become expert programmers. This democratization of advanced methods encourages a broader range of voices to participate in interdisciplinary projects and helps prevent AI from becoming the exclusive domain of a few technically oriented disciplines.

3. AI AND CURRICULUM DESIGN: EXPANDING THE SCOPE OF INQUIRY

AI's impact is equally evident in the realm of curriculum design. Traditional curricula tend to be relatively static; program requirements and course sequences are revised slowly, sometimes lagging behind changes in knowledge, technology, and labor markets. By contrast, AI makes it possible for institutions to analyze patterns in course enrollments, student outcomes, research interests, and societal trends and to use this information to adapt curricula more quickly and strategically (Farhood et al., 2025; Wang et al., 2023).

In interdisciplinary programs, this can translate into the identification of new areas of convergence such as climate policy and data science, ethical AI governance, or biomedical humanities that reflect emerging societal priorities. Program leaders can then revise degree structures or introduce new courses that draw on faculty expertise from multiple departments. In this sense, AI does not replace human curricular judgment, but supports it with richer and more timely information about how well existing programs align with institutional missions and student needs.

Inside the classroom, AI enriches pedagogy by making it easier to create learning experiences that mirror the complexity of real-world systems. Through AI-powered simulations, students can explore how changes in one part of a system for example, a public health intervention, a new environmental policy, or an economic shock and ripple through other domains (Selwyn, 2019). These experiences prompt students to consider tradeoffs, unintended consequences, and feedback loops, which are central insights for any interdisciplinary thinker.

AI-based tools also enable new forms of textual and conceptual exploration. NLP systems can help students compare how different disciplines frame the same topic, such as "risk" in engineering, finance, and public health, or "identity" in psychology, sociology, and literary studies. By highlighting differences in vocabulary, argument structure, and evidence, AI makes the otherwise invisible contours of disciplinary discourse more visible (Stoltz & Taylor, 2023). Interdisciplinary students can then use this awareness to negotiate among perspectives rather than simply juxtaposing them.

Generative AI introduces yet another dimension. As Xie et al. (2025) note, educators are increasingly experimenting with AI to generate case studies, scenarios, or problem prompts tailored to specific learning outcomes. An instructor might ask an AI system to create a scenario that involves a conflict between data privacy and public health, or between environmental justice and economic development, and then guide students through an analysis that draws on law, ethics, statistics, and community studies. In this way, AI becomes part of the creative infrastructure of interdisciplinary teaching, expanding the scope of what is possible within a given course or program.

4. Personalized Learning and the Development of Interdisciplinary Competencies

Interdisciplinary programs often attract students who do not see themselves fitting comfortably into a single discipline. They may be drawn to questions that cross fields—such as food systems, global health, digital culture, or sustainability and they may bring strengths that are not well captured by standardized metrics. AI-driven adaptive learning platforms can help such students navigate the complexity of interdisciplinary study by adjusting content, pacing, and support to their evolving abilities and interests (Moroianu et al., 2023).

These platforms can track how students perform on tasks that draw from different domains and then recommend specific readings, exercises, or projects that build on strengths while addressing gaps. For a student interested in the intersection of public policy and data science, an AI system might suggest tutorials in statistical reasoning, case studies in policy analysis, and ethical discussions about algorithmic decision-making. For another student working at the intersection of literature and media studies, AI tools might point toward resources on digital storytelling, multimodal analysis, and the social impacts of recommendation algorithms.

Beyond content recommendation, AI can support competency-based learning models in which students progress when they demonstrate mastery rather than when they complete a fixed schedule of courses. Zhu and Chen (2025) argue that AI systems are particularly well suited to monitoring progress toward specified competencies and providing ongoing formative feedback. Interdisciplinary programs can leverage this capacity by defining cross-cutting competencies such as systems thinking, ethical reasoning, cross-cultural communication, and data literacy, and then using AI to help students track their growth over time.

The process of learning with AI tools also contributes to students' development of AI literacy. Yin et al. (2024) emphasize that being literate in AI involves not only understanding technical basics but also grappling with the social, political, and ethical implications of algorithmic systems. In interdisciplinary contexts, students can examine AI from multiple angles for example, as a technical system, as a social actor, and as a policy problem reinforcing the idea that technology and society are deeply intertwined. This holistic understanding prepares students to use AI critically and responsibly in their future work.

5. Ethical Considerations, Access, and Institutional Challenges

The integration of AI into interdisciplinary studies would be incomplete and potentially harmful if it ignored the ethical and institutional challenges associated with these technologies. Algorithmic bias is a central concern. As Baker and Hawn (2022) demonstrate, AI systems used in educational settings can encode and reproduce existing inequalities, leading to misclassification of students, unfair predictions about performance, or biased recommendations. For programs that aim to promote equity and social justice, such outcomes are unacceptable and must be systematically addressed.

Privacy and data protection are equally pressing. AI-based learning platforms often collect granular information about students' behaviors, preferences, and performance. Without clear governance structures, there is a risk that such data could be used in ways that students do not understand or consent to, or that they could be exposed to security breaches. Holmes et al. (2022) call for institution-wide frameworks that establish transparent norms for data collection, storage, and use, and that involve students and faculty in governance rather than treating AI infrastructure as a purely technical matter.

Issues of access and inclusion also loom large. Knox (2020) warns that AI can exacerbate educational inequality if it is deployed only in well-resourced institutions or if it requires hardware, connectivity, or prior knowledge that not all students possess. Interdisciplinary programs committed to access must ensure that AI-enhanced opportunities are available across the student population, and that the introduction of sophisticated tools does not inadvertently create new forms of exclusion.

Finally, there is the question of faculty readiness and institutional capacity. Zawacki-Richter et al. (2019) note that many educators feel unprepared to integrate AI into their teaching in ways that go beyond surface-level novelty. Professional development, peer learning communities, and cross-departmental collaboration are essential if faculty are to design AI-enhanced learning experiences that truly support interdisciplinary goals. Without such support, AI adoption may be uneven, with a few enthusiasts carrying the load while others remain skeptical or disengaged.

6. Emerging Opportunities: AI as a Subject of Interdisciplinary Study

While much of this discussion has treated AI as a tool that supports interdisciplinary work, AI is also increasingly a central topic of interdisciplinary study in its own right. Courses and programs have begun to explore AI from multiple angles, asking what it means for human creativity, social organization, governance, employment, and identity. Selwyn (2019) argues that the rise of AI in education forces educators to reconsider fundamental questions about the purpose of schooling, the role of teachers, and the value of human judgment in an age of intelligent machines.

In an interdisciplinary course on AI, students might read philosophical texts on agency and autonomy, sociological studies of automation and labor, computer science papers on neural networks, legal analyses of algorithmic accountability, and literary works that imagine AI-infused futures. Such a course exemplifies the kind of integrative thinking that interdisciplinary programs seek to cultivate, while engaging directly with one of the most consequential technological developments of our time.

By treating AI as both object and instrument of inquiry, interdisciplinary programs help students to see technology not as an external force acting upon society, but as something shaped by human decisions, values, and institutions. This orientation encourages students to imagine themselves not only as users of AI but as participants in the larger conversation about how AI should be designed, governed, and integrated into collective life.

7. Conclusion

AI is already transforming interdisciplinary studies curriculum and programs, and its influence will continue to grow. As this paper has argued, AI can serve as a powerful catalyst for collaboration across disciplines, an engine for innovative curriculum design, a foundation for personalized and competency based learning, and a central topic of critical, integrative inquiry. When deployed thoughtfully, AI supports the core mission of interdisciplinary studies: to prepare students to understand and respond to complex problems in ways that respect multiple forms of knowledge and the realities of social and ecological interdependence (Xie et al., 2025; Yin et al., 2024; Viardot et al., 2024).

Realizing this potential, however, requires careful attention to ethical, institutional, and equity-related concerns. Interdisciplinary programs must confront issues of algorithmic bias, data governance, access, and faculty development head-on rather than treating them as peripheral to the project of innovation. They must also cultivate critical AI literacy among students and faculty, encouraging them to question and interpret AI outputs rather than accepting them uncritically. If these conditions are met, AI can become an ally rather than a threat to the values that have long animated interdisciplinary education. It can help students and faculty navigate complexity with greater clarity, creativity, and ethical awareness, and it can open new pathways for inquiry that were previously unavailable. In an era defined by rapid technological and social change, such capacities are not merely desirable; they are essential.

References

Alpaydin, E. (2020). *Introduction to machine learning* (4th ed.). MIT Press.

Baker, R. S., & Hawn, A. (2022). Algorithmic bias in education. *International Journal of Artificial Intelligence in Education, 32*(4), 1052–1092. https://doi.org/10.1007/s40593-021-00285-9

Bearman, P., Bernhardt, A., Bison, I., & others. (2020). Big data and the future of social science. *Sociological Methods & Research, 49*(3), 635–651.

Dede, C. (2014). The role of digital technologies in deeper learning. In J. Bellanca (Ed.), *Deeper learning: Beyond 21st century skills* (pp. 89–106). Solution Tree Press.

Farhood, H., Nyden, M., Beheshti, A., & Muller, S. (2025). Artificial intelligence-based personalized learning in education: A systematic literature review. *Discover Artificial Intelligence, 5*, 331.

Holmes, W., Porayska-Pomsta, K., Holstein, K., Sutherland, E., Baker, T., & Bingler, V. (2022). Ethics of AI in education: Towards a community-wide framework. *British Journal of Educational Technology, 53*(4), 675–690.

Kelleher, J. D., Namee, B. M., & D'Arcy, A. (2020). *Fundamentals of machine learning for predictive data analytics* (2nd ed.). MIT Press.

Knox, J. (2020). Artificial intelligence and inclusive education: Speculative futures and emerging practices. *British Journal of Sociology of Education, 41*(8), 1101–1117.

Laney, D. (2021). AI in higher education: Impact on teaching and learning. *International Journal of Educational Technology, 15*(4), 55–72.

Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1–16). Association for Computing Machinery.

Macanovic, A. (2022). Text mining for social science – The state and the future of computational text analysis in sociology. *Social Science Research, 107*, 102–121.

Moroianu, N., Iacob, S.-E., & Constantin, A. (2023). Artificial intelligence in education: A systematic review. In *Proceedings of the 6th International Conference on Economics and Social Sciences: Geopolitical perspectives and technological challenges for sustainable growth in the 21st century* (pp. 1003–1015).

Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education.* Polity Press.

Stoltz, D. S., & Taylor, M. A. (2023). *Mapping texts: Computational text analysis for the social sciences.* Oxford University Press.

Viardot, E., Abulibdeh, A., & Elbanna, A. (2024). Artificial intelligence in higher education: Research notes from a technological transition. *Technological Forecasting & Social Change, 206*, 122–135.

Wang, S., Tran, T., Wang, J., Wang, F., Zhu, Z., & Du, Z. (2023). Artificial intelligence in education: A systematic literature review. In *WHICEB 2023 Proceedings* (Paper 45). Association for Information Systems.

Xie, R., & colleagues. (2025). Evolution of learning: Assessing the transformative impact of generative AI on higher education. *Frontiers of Digital Education*. https://doi.org/10.1007/s44366-025-0058-7

Yin, Y., & others. (2024). Critical artificial intelligence literacy: A scoping review and framework. *International Journal of Child–Computer Interaction, 29*, 100–115.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education: Where are the educators? *International Journal of Educational Technology in Higher Education, 16*, 39.

Zhu, X., & Chen, L. (2025). Artificial intelligence in higher education: A systematic review of opportunities and challenges. *Multimodal Technologies and Interaction, 9*(8), 84. MDPI

Ruecker, S., Radzikowska, M., & Sinclair, S. (2011). *Visual interface design for digital cultural heritage: A guide to rich-prospect browsing.* Ashgate Publishing.

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