The AIR Professional File

Fall 2023 Volume

Supporting quality data and decisions for higher education.

SPECIAL ISSUE EDITED BY HENRY ZHENG AND KAREN WEBBER FEATURING FOUR ARTICLES ON ARTIFICIAL INTELLIGENCE AND ADVANCED ANALYTICS

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PREFACE

Artificial Intelligence and Advanced Analytics in Higher Education: Implications for Institutional Research and Institutional Effectiveness Practitioners

New technologies in our post-pandemic world have prompted substantial changes in every facet of higher education. The emergence of Big Data is one of several key facilitating conditions that accelerated the adoption of artificial intelligence (AI) and machine learning (ML) in key application areas. According to Gartner (2023), Big Data are the high-volume, high-velocity, and/or high-variety information assets that demand cost-effective and innovative forms of information processing that enable enhanced insight and decision-making, and process automation. Considerations for when, how, and why we use Big Data and forms of AI data-informed analytics are critical in institutional research (IR) and institutional effectiveness (IE).

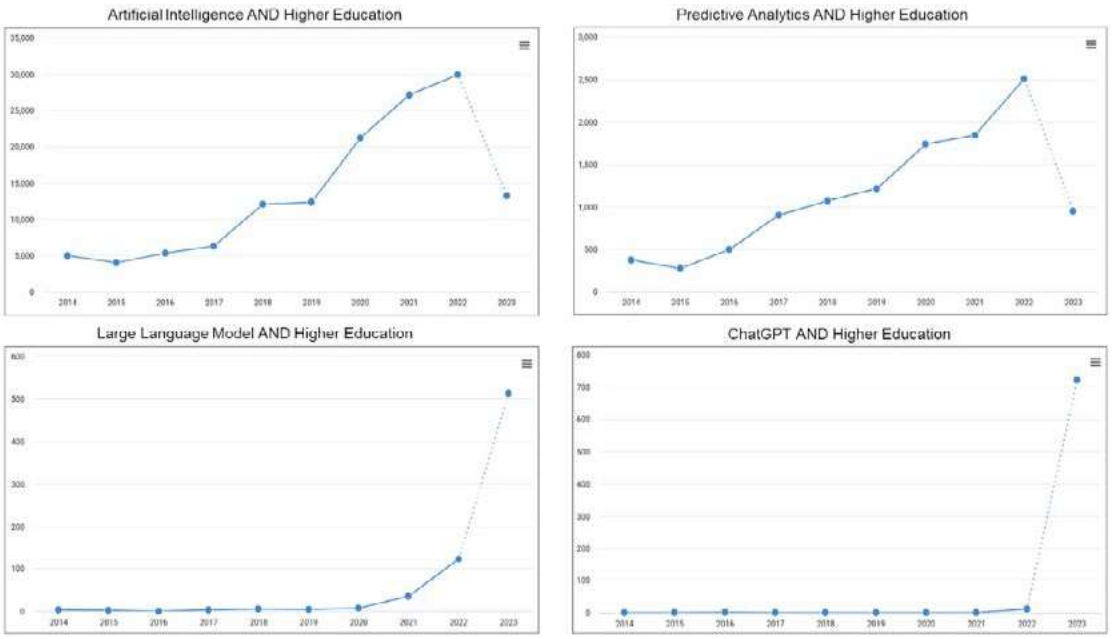
Recently, Chat Generative Pre-trained Transformer (ChatGPT) and generative AI tools including those listed by Dilmengali (2023), have grabbed our attention for their novelty and ability to provide answers to questions in a conversational style. Although they have risks (Reagan, 2023), and refinements are being introduced constantly (as is inherent in a continuous learning model), we find the hands-on user experience of these AI chatbots simultaneously interesting and worrisome. ChatGPT bots and image-building tools such as DALL-E from OpenAI seem to be the latest in AI applications that have generated media hysteria. Other AI-supported systems have been used in higher education, however, including the Georgia Institute of Technology's use of AI Jill Watson (Goel & Polepeddi, 2019) for student tutoring and the U.S. Department of Education's use of a chatbot for federal financial aid (Aidan) (Federal Student Aid, n.d.). The soaring interest in ChatGPT and other AI tools signal that the AI/ML revolution is accelerating (McKendrick, 2021). According to Bill Gates (2023), there have been two technology revolutions in his lifetime: the first was the introduction of a graphical user interface as the forerunner of every modern operating system; and now there is a second revolution: "The development of AI is as fundamental as the creation of the microprocessor, the personal computer, the Internet, and the mobile phone. It will change the way people work, learn, travel, get health care, and communicate with each other" (Gates, 2023).

In this special volume of the biannual Association for Institutional Research's (AIR) *Professional File*, we briefly describe some of the key factors that

helped drive the development of AI and ML in higher education; we also include a focus on the implications and opportunities for IR and IE professionals. Although this topic continues to evolve, we think it is important to forge ahead with some discussion, while acknowledging that some aspects of these new tools will change—and will change rapidly. Nevertheless, as critical colleagues on our campus and in policy agencies, we need to be engaged with others on this topic right away. We believe it is essential that IR/IE colleagues (who either already have or who want a seat at the table) contribute actively to discussions about AI in higher education. Being involved in these discussions with senior administrative officials and academic instructional staff members can help cement the perception that IR/IE professionals are knowledgeable, broadly skilled, and able to situate issues within the context of a specific campus environment (yes, IR/IE professionals are indeed multitalented). We could wait 6 to 12 months or more and see how the AI tools evolve, but we believe it is more valuable for IR/IE leaders to get engaged as soon as possible, considering the issues and implications, while being mindful of the likelihood that there will be changes to the tools, techniques, data governance, and other institutional policies.

According to Digital Science's Dimensions Database (dimensions.digital-science.com, accessed May 23, 2023), the number of publications in higher education related to AI in general as well as publications specific to large language models (LLMs), predictive analytics, and ChatGPT, climbed a steep trajectory in the past few years. As shown in Figure 1, publications about general AI and predictive analytics have been growing steadily since 2017, but publications about LLMs and generative AI models such as ChatGPT have exponentially increased only within the past year.

Figure 1. Scholarly Publications in Key Artificial Intelligence–Related Areas in Higher Education



If the speed that ChatGPT grabbed people's attention is stunning, the subsequent rush to leverage its growth is equally dazzling. Companies and organizations rushed to create plugins to ChatGPT. (A ChatGPT plugin is a software add-on that integrates other applications into the ChatGPT AI chatbot. Plugins allow a third-party software or content generator to tap into ChatGPT's capabilities for search optimization and conversational interaction.) As of June 17, 2023, less than 7 months since the official launch of ChatGPT, nearly 500 plugins have been published and connected to ChatGPT 4.0. For example, the plugin ScholarAI allows users to use ChatGPT's interface to answer questions on scholarly articles and research papers. The plugin SummarizeAnything helps users summarize books, articles, and website content. More plugins and similar products are likely to follow.

AI and other advanced analytics in higher education can serve to benefit students in a number of ways. Informed by the work of Zeide (2019) and Holmes and Tuomi (2022), we group the current AI and advanced analytic techniques available in higher education into four categories:

1| **Institutional use**, including marketing and student recruitment, estimating class size, optimizing course catalog descriptions, allocating resources, network security, and facial recognition

2| **Student support**, including academic monitoring, course scheduling, suggesting majors and career pathways, allocating financial aid, identifying students at risk, and supporting mental health

3| **Instruction**, including personalized learning, creating library guides, using generative language models (e.g., ChatGPT, DALL-E), and making grading more efficient

4| **Scholarly research**, including synthesizing literature, drafting grant proposals, and creating new knowledge in many disciplines (both within individual disciplines as well as cross-disciplinary collaborations)

During the early years when AI was introduced to higher education, both in the United States and in other countries, we saw some promising applications of AI and ML. Early adopters sought to enhance student success through tools such as online chat assistants, homework tutoring chatbots, or course learning systems that sought to gather student learning data from multiple sources. Some of the early tools were not user friendly, lacked comprehensive data, and/or did not have faculty buy-in and so did not remain viable. However, these early tools sharpened our thinking, and the ensuing refinements moved members of the higher education community forward on how digital technologies can contribute positively to the higher education mission.

Over the past few years, Georgia State University (GSU) has become well known for its success in gathering and using voluminous data points every day that are related to student characteristics (e.g., financial aid need) to predict and track student academic progress. Their extensive use of the data-enabled digital systems, in combination with human advisors, has produced a significant impact on student success and graduation. The GSU system was quite successful, and GSU now hosts the National Institute of Student Success (NISS), a national effort aimed at helping institution officials to identify potential challenges related to student access, finding ways to maximize impact and ensure success for all students.

A number of institutions are incorporating AI into teaching and learning as well as into campus operations. For example, team members at Rensselaer Polytechnic Institute have incorporated an AI-powered assistant into a language-immersive classroom that helps students learn to speak Mandarin (Su, 2018). According to Gardner (2018), leaders at Elon University are using an AI-based course planning and advising system developed by a tech company, Stellic, to plan courses, consider cocurricular activities, and keep students on the path to graduation. Also according to Gardner, leaders at the University of Iowa are using AI to monitor campus buildings for energy efficiency and to monitor for facilities problems. These and other examples of AI-based systems can promote student and institution success, but they also require staff to have robust technical skills and relevant ways of thinking about data.

An important concern about the use of Big Data or comprehensive predictive analytic models is the high potential for the unintended inclusion of bias, either through training data that do not fully represent the population under study or that fail to contextualize the results to a broader population. The unique changes that occurred during or as a result of the Covid-19 pandemic, as well as continued emphases on the need for diversified campuses, left many institution officials unable to reliably use historical data for predicting the future.

Along with applications in teaching and learning and overall student success, AI is growing its applications in research as well. We have an explosive list of AI applications in business and industry such as health care, banking, and retail customer service. AI is gaining strength in university endeavors such as Emory University's AI. Humanity Initiative and the Graz Center for Machine Learning. Both of these initiatives are focused on interdisciplinary efforts to consider ways in which AI can improve aspects of society. We believe that collaborative, interdisciplinary efforts like these will make dramatic improvements in our higher education systems and overall quality of life.

An ongoing concern about data analytics will be ensuring ample representation of the population under study and/or that the analyses are contextualized to the broader population. The unique changes that occurred during or as a result of the Covid-19 pandemic, as well as continued emphases on the need for diversified campuses, left many institution officials unable to use historical data to reliably predict the future. Vigilance with continued improvements in data security and unbiased models will continue as we progress in the use of AI in higher education, and IR practitioners must be an integral part of these discussions.

Foreseeing the significant changes and implications from AI-assisted education technology implementation in all aspects of education, the U.S. Department of Education issued a guidance document (U.S. Department of Education, 2023) acknowledging that AI poses both risks and opportunities in teaching, learning, research, and assessment. The report recommends several key considerations as key stakeholder continue to explore the use of AI in educational and other academic endeavors:

- **Emphasize humans-in-the-loop**: Keep a humanistic view of teaching front and center.
- **Align AI models to a shared vision for education**: Humans, not machines, should determine educational goals and measure the degree to which models fit and are useful.

- **Design AI using modern learning principles**: Connect AI algorithms with principles of collaborative and social learning and respect the student not just for their cognition but also for the whole human skillset.
- **Prioritize strengthening trust**: Incorporate safety, usability, and efficacy in creating a trusting environment for the use of AI.
- **Inform and involve educators**: Show the respect and value we hold for educators by informing and involving them in every step of the process of designing, developing, testing, improving, adopting, and managing AI-enabled edtech.
- **Develop education-specific guidelines and guardrails**: The issues are not only data privacy and security, but also new issues such as bias, transparency, and accountability.

Clearly, the growth of AI tools in the world around us will also impact current strategies and actions in higher education. Allowing only a short time to adjust, higher education officials must continue to consider its impact on student and institutional success. This special volume of the *Professional File* includes four thoughtful articles related to specific facets of AI and/or advanced analytics in higher education today. In this volume we seek (a) to bring attention to and provide an effective introduction to AI/ML developments in higher education; (b) to introduce IR/IE professionals to some of the latest developments in AI/ML, especially in generative AI, natural language processing, and predictive analytics; and (c) discuss policy, ethics, privacy, and IR/IE workforce implications of these new developments. Each article covers a specific facet or application of AI in higher education. Time and space do not allow us to cover all of the equally important topics, but we offer these topics as a starting point for future discussions.

In the first article, Kelli Bird describes promises as well as the cautions that must be considered in the use of predictive analytics to identify at-risk students. With her eyes wide open to the potential challenges of algorithmic bias and the need for a personal touch, Bird offers examples of success in student support that have occurred through carefully considered predictive modeling. Bird makes an excellent point that, as more-advanced analytics tools become available, the main challenge will not be whether the algorithms (i.e., from machines) are able to identify at-risk students better and more efficiently than humans. Instead, most of the challenges will surround the question of how humans will use the output that machines provide. This aligns with the U.S. Department of Education's key observation that humans, not machines, should determine educational goals and measure the degree to which models fit and are useful.

In the second article, Emily Oakes, Yih Tsao, and Victor Borden urge readers to consider how predictive analytics at large scale as well as applications of AI can be used to center the student voice in developing higher education access and policy development related to learning analytics and AI-embedded student supports. Like Bird, these authors remind readers to be mindful of the potential biases that can be inadvertently built into analytic models, and they urge researchers to ground data in a social justice framework. This cannot be a one-and-done approach, but instead must include a general framework that is used for all analytics tasks as well as the policies governing the collection, management, and implementation of data-based systems. Oakes, Tsao, and Borden's article aligns well with some of the keen observations made by Cathy O'Neil in her bestselling book, *Weapons of Math Destruction*, such as suggesting that, lacking a humanistic perspective,

machine algorithms would rely on historical data and learning models that cause harm to those less favored by historical data and machine logics.

We know that academic advising is critical to student success, however, resource-constrained higher education institutions might not have the capacity to offer comprehensive student support that can yield success. Aspects of AI including LLMs enable large-scale collection of data and automated data systems to assist; authors of the third article describe an enterprise-level academic system called AutoScholar. Professor Rawatlal developed the system and colleague Rubby Dhunpath led the implementation of a multifaceted advising system that provides information to students as well as to their instructors, department leaders, and other administrative managers who seek to examine student success across a college or total institution. Authors Rawatlal and Dhunpath describe the AutoScholar system and acknowledge the importance of being able to provide advising information to students, regardless of institutional resources. They acknowledge the high benefits of a data-informed application that augments automated information with human judgement.

In the fourth and final article in this volume, Michael Urmeneta starts with a review of recent discussions on the potential impact of AI in higher education, the increasing proliferation of AI tools, and the need for ethics and accountability. Urmeneta reflects on transitions that helped carve out the path toward AI and advanced data analytics in higher education as well as on the need for ethics and accountability, and offers a cogent discussion on many important implications for IR and IE professionals. Although our landscape for ML and other forms of AI continues to evolve, Urmeneta reminds us that the future is here, and it is important that we understand the technologies, how we will use them, and how we will ensure that the data are used responsibly and with transparency. As those who are deeply embedded in the collection, storage, analysis, and reporting of data, IR and IE professionals must firmly understand the data, and how they are being used within a particular context and without black box designs. IR professionals can ensure ethical deployment, privacy and confidentiality of data, and guard against bias. We like Urmeneta's comment, "Being a passive spectator is neither optional nor tenable." With AI and advanced data analytics, we encourage IR/IE professionals to seize the day!

Although the first paper on AI was published more than 50 years ago and has been embedded in business and industry practices for a few decades, applications of AI are quite new in the higher education arena. We realize that we offer this volume to *Professional File* readers closer to the beginning of the journey into AI and advanced analytics in the higher education context. The months ahead will see a growth in publications on this topic in higher education, but we are confident that the articles herein can help *Professional File* readers to contemplate their role and ways to stay actively involved.

In its policy guidance document, the U.S. Department of Education (2023, p. 4) acknowledged, "AI is advancing exponentially, with powerful new AI features for generating images and text becoming available to the public and leading to changes in how people create text and images. The advances in AI are not only happening in research labs but also are making news in mainstream media and in educational-specific publications." With the rapid speed of AI-related developments, the U.S. Department of Education considered its policy guidance document not as a definitive document but

rather as a starting point for discussion. Likewise, we believe that this volume of *Professional File* offers beginning conversations from the authors.

We hope you enjoy the articles in this volume. We believe that AI and advanced analytics will continue to grow in our world of higher education, and, as they grow, we hope you will contribute to the positive impact of AI for IR and IE practitioner success.

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Reflections on the Artificial Intelligence Transformation: Responsible Use and the Role of Institutional Research and Institutional Effectiveness Professionals

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About the Author

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Abstract

This article explores the potential impact of artificial intelligence (AI) and machine learning (ML) on higher education. It overviews current generative AI capabilities and argues for ethical frameworks to address issues such as bias. The article advocates for a multidisciplinary governance approach involving institutional stakeholders by examining past academic technology adoption. It highlights the strategic role institutional research (IR) and institutional effectiveness (IE) professionals can play in navigating AI complexities. This article provides specific suggestions for IR/IE professionals to embrace the role of AI ethicist: continuously developing AI literacy, ensuring ethical deployment, upholding privacy and confidentiality, mitigating bias, enforcing accountability, championing explainable AI, incorporating student perspectives, and developing institutional AI policies. The article concludes by asserting that IR/IE's research expertise, ethical commitment, and belief in human judgment equip the field to adapt to and lead in the AI era. By taking an active role, IR/IE can shape the technology's impact to benefit higher education.

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INTRODUCTION

As discussed in this volume's preface and evidenced by the other articles in this volume, artificial intelligence (AI) and machine learning (ML) are far from new concepts (Stahl, 2021). Until recently, however, discussions around these tools were predominantly confined to specialists, researchers, and enthusiasts. This changed in November of 2022 when Chat Generative Pre-trained Transformer (ChatGPT) provided unprecedented access to this technology, ushering in a new wave of widespread interest. Seemingly overnight, generative AI had catapulted to the forefront of public awareness. AI and ML started to permeate every field and industry, spanning technology, business, health care, law, and education. The reactions ranged from excitement and enthusiasm to criticism and concern. While generative AI has the potential to increase efficiency, encourage exploration, and spark creativity, it also has the potential to disseminate misinformation, compromise privacy, and amplify biases (Megahed et al., 2023; Shahriar & Hayawi, 2023). Certainly, as these technologies continue to evolve, they also continue to introduce opportunities and challenges.

This article reflects on the potential impact of AI in higher education, from the increasing proliferation of AI tools, to the need for ethics and accountability, to the pivotal role of institutional research (IR) and institutional effectiveness (IE) offices. It begins by exploring generative AI's evolution and capabilities. It then advocates for robust ethical framework and accountability measures to mitigate AI biases. It next examines disruptive technology in academia through a historical lens. Next it discusses the need to leverage IR and IE effectiveness expertise. It concludes by embracing the role of the AI ethicist, and challenges IR/IE professionals to not only navigate the complexities of AI but also to harness its potential to shape a sustainable and inclusive future.

EVOLUTION AND CAPABILITIES OF GENERATIVE ARTIFICIAL INTELLIGENCE

Today's generative AI tools have an array of capabilities, including the ability to summarize and condense complex information, generate art and imagery, and streamline writing and research (Megahed et al., 2023). Using natural language prompts, large language models (LLMs) like ChatGPT, Google Bard, Microsoft Bing Chat, Jasper.ai, Perplexity, HuggingChat, Language Model for Dialogue Applications (LaMDA), and Large Language Model Meta AI (LLaMA) can draft sophisticated written content. Based solely on descriptive text, these models can create reports, marketing materials, cover letters, and program code. Furthermore, they can summarize dense material and provide sentiment analysis of uploaded content. Generative art tools such as Midjourney, Stable Diffusion, Leonardo AI, and Adobe Firefly have the capability to convert descriptive text into studio-quality art and imagery. Finally, AI-enhanced tools like Elicit and Consensus can accelerate the process of identifying and reviewing research studies and articles, complete with citations (Lund et al., 2023).

The landscape continues to evolve. Third-party plugins can enhance ChatGPT capabilities by providing access to external resources and services (OpenAI, 2023). Multimodal large language models (MLLMs) like Microsoft's Kosmos-2 can accommodate a broader range of input types than just text, including images, audio, and video (Peng et al., 2023). Autonomous AI agents, such as Auto-GPT and Tree of Thoughts, can be assigned an objective and can be programmed to run on an iterative loop until that objective has been met (Nakajima, 2023;

Tindle, 2023; Yao et al., 2023). In these models, intermediate steps are generated, tested, and updated without human guidance.

Research indicates that GPT-4 is performing "strikingly close to human-level" in executing tasks across a diverse range of disciplines such as law, medicine, psychology, mathematics, and programming (Bubeck et al., 2023, p. 1). In 2022, GPT-3 was nearly able to pass the U.S. Medical Licensing Exam (Jenkins & Lin, 2023; Kung et al., 2023). And in 2023 GPT-4 successfully passed the Uniform Bar Examination (Katz et al., 2023). This evolution highlights the rapid advancements in AI, marking an era of possibility for this transformative technology.

THE NEED FOR ETHICS AND ACCOUNTABILITY IN MITIGATING ARTIFICIAL INTELLIGENCE BIASES

The future is not a vague, distant concept. In discussions about technology and society, a quote by science fiction author William Gibson (2003) is frequently cited: "The future is already here—it's just not evenly distributed." His phrase implies a disparity where advanced technologies are available to some groups but not to others. It highlights the need to democratize technology and make its benefits more universally accessible.

Coded Bias is a 2020 documentary film directed by Shalini Kantayya that delves into the biases embedded within AI technology. The film centers around MIT media researcher Joy Buolamwini, who discovered that facial recognition systems failed to recognize her own face. This discovery led Buolamwini to investigate further how AI technology can disproportionately affect minorities (Kantayya, 2020). The film goes on to criticize how the lack of legal structures around AI results in human rights violations. It reveals how specific algorithms and AI technologies discriminate based on race and gender, affecting vital areas of life such as housing, job opportunities, health care, credit, education, and legal issues.

Following her discoveries, Buolamwini and her colleagues testified about AI before the U.S. Congress. Buolamwini then established the Algorithmic Justice League (AJL), a digital advocacy group whose goal is to address these biases and create a fair and accountable AI ecosystem by increasing awareness, equipping advocates, and uncovering AI abuses and biases (AJL, n.d.). AJL members advocate for accountability through third-party audits of AI algorithms (Koshiyama et al., 2021; Raji et al., 2023).

Fortunately, progress has been made since the documentary *Coded Bias* was released (Kantayya, 2020). In August 2022 AI resolutions were introduced in at least 17 states (National Conference of State Legislatures, 2022). In October of the same year, the White House (2022) published the "Blueprint for an AI Bill of Rights" to address potential harms. Meanwhile, the European Parliament has taken the lead in legislation safeguarding individuals from possible AI-related hazards. In June 2023 the Council of the European Union voted to approve the Artificial Intelligence Act (European Parliament and Council of the European Union, 2021), the most far-reaching legislative piece on AI. The European Union's Artificial Intelligence Act addresses concerns about surveillance, algorithmic discrimination, and misinformation; it also introduces regulations and requirements for AI developers, which could be likened to the European Union's General Data Protection Regulation (2018).

The future is indeed upon us but is not uniformly accessible, as evidenced by the bias in technologies like AI. The work by Joy Buolamwini and the AJL has brought this bias to the forefront. These bias-related issues underline the importance of democratizing technology by enforcing privacy, fairness, and transparency in AI tools (Cath, 2018; Mhlanga, 2023). With the increasing capabilities of AI models, the urgency for human oversight becomes ever more crucial (Prud'homme et al., 2023). While AI can accomplish remarkable feats, it is fundamentally important to acknowledge that human guidance and ethical considerations are pivotal to guaranteeing responsible and beneficial outcomes.

A HISTORY OF DISRUPTIVE TECHNOLOGY IN ACADEMIA: A MULTIDISCIPLINARY APPROACH TO GOVERNANCE

AI is not academia's first encounter with disruptive technology. One only needs to look to the recent past to see similar concerns and debates around the use of the Internet, analytics, mobile technology, data science, and cloud computing. Addressing the impact of these technologies required a multidisciplinary approach involving higher education professionals from across the academy. The same approach can be used for generative AI.

Gasser and Almeida (2017) addressed how governance mechanisms, accountability, and transparency can be jointly examined with broad stakeholders when dealing with technological black boxes. Mirroring a model used for the General Data Protection Regulation, the authors proposed a three-layered framework for regulating AI systems, covering its technical, ethical, and legal aspects. These layers offered a broad but practical approach to implementing governance structures for AI, an approach that can vary among industries and organizations.

Officials in higher education institutions can use a similar multipronged approach. Colleagues in multiple divisions can work both independently and in concert to tackle AI issues. University information technology offices can address AI from a technical perspective by managing how physical and software systems interact with AI algorithms. This layer can focus on transparency, audits, algorithmic accountability, and fairness in data usage. Likewise, the general counsel, compliance, and human resources offices can address AI from a regulatory and policy perspective. This layer can incorporate technical and ethical insights into legal and regulatory frameworks (Viljanen & Parviainen, 2022). Finally, IR and IE officers can approach AI from an ethical perspective through oversight, evaluation, policy development, and data governance.

Given the speed of advancements, even full-time AI researchers report feeling anxious and overwhelmed (Togelius & Yannakakis, 2023). The difficulty for educational professionals is further exacerbated by the traditionally glacial pace of educational transformation. However, established principles and frameworks can be a consistent foundation for navigating the evolving technological landscape (Taeihagh, 2021).

LEADING THE CHARGE: LEVERAGING INSTITUTIONAL RESEARCH AND INSTITUTIONAL EFFECTIVENESS EXPERTISE

IR/IE offices are tasked with collecting, analyzing, and using data to support decision-making, planning, policymaking, and institutional improvement. Moreover, it is a fundamental aspect of the IR/IE professionals' role to establish robust engagement, encourage collaboration, and ensure open communication with stakeholders across their respective institutions. As custodians and advisors of data-informed decision-making, IR/IE professionals provide crucial context and nuance to their organizations. As such, IR/IE professionals are frequently entrusted to lead and advise on projects related to data literacy, data governance, and institutional assessment. Leadership in implementing AI strategies is not such a far reach. The skillset, relationships, and experience required to excel in their current roles can help IR/IE professionals navigate this era of technological change. The ability to interpret data and communicate insights effectively is essential to AI development and implementation.

The remainder of this article outlines how IR/IE professionals can take an active role in leveraging AI for their institutions. Some suggestions may seem aspirational, given that many IR/IE offices frequently work under high demands and with scarce resources. However, strategies that are applied incrementally can still lead to impactful changes despite resource limitations. AI can benefit small IR/IE offices by enhancing workflow to create more capacity. The time saved by leveraging AI individually can then be redirected toward leveraging AI organizationally.

EMBRACING THE ROLE OF ARTIFICIAL INTELLIGENCE ETHICIST: GUIDELINES FOR INSTITUTIONAL RESEARCHERS AND INSTITUTIONAL EFFECTIVENESS PROFESSIONALS

One crucial role that IR/IE professionals can play is that of AI ethicist. Niederman and Baker (2023) argued that the ethical issues associated with AI are not unique, and current frameworks have the capacity to tackle them. In their study, Jobin et al. (2019) conducted an extensive analysis of 84 AI ethics reports that had been drawn from a diverse range of private corporations, research institutions, and governmental bodies. Through a thematic analysis, they discovered an agreement across these reports, centering around five key ethical considerations for AI: transparency, fairness, safety, accountability, and privacy. To guide their actions, IR/IE professionals can look to the Association for Institutional Research (AIR) Statement of Ethical Principles (AIR, 2019) as their North Star. The statement equips IR/IE professionals with a flexible and familiar framework to effectively handle the concerns and complexities associated with AI. It comprehensively addresses a multitude of concerns that have been raised by those expressing apprehension about AI. Like the above ethical considerations, the AIR statement emphasizes privacy, accuracy, contextual relevance, fairness, transparency, and accessibility. These principles can serve as a compass to guide practitioners in their work with AI as the AIR statement has successfully done with the tools and technologies that preceded it. Following are a few suggestions on how IR/IE professionals can apply these ethical principles.

Continuous Learning and Development

A good guide must understand the terrain. The first step in leveraging AI involves taking time to understand and experiment with it. As with any new skill, proficiency will develop through practice and application. Fortunately, gaining AI expertise is no longer a steep hill to climb.

Many LLMs, such as ChatGPT, Google Bard, Claude, and Microsoft Bing Chat, are free and accessible. Despite some models being proprietary, the information about the technology and its foundational principles are documented and available. The only differences among models lie in the specific data sets on which they are trained—which can vary significantly. Traditional ML models often rely on supervised learning, where the model is trained on data sets that are known. LLMs, on the other hand, use unsupervised learning techniques on vast amounts of data in order to train models to predict the next likely word in a phrase or sentence. Given the sheer enormity and complexity of these models, LLMs are effectively black boxes designed to generate human-like responses. Knowing this, IR/IE practitioners should focus on applying LLMs to areas where their strengths can be used most effectively.

From a practical standpoint, there is no shortage of documentation, videos, forums, and communities to obtain tips, techniques, and examples. The act of designing, testing, and refining AI instructions is called "prompt engineering." The process is similar to developing effective research questions. It requires an understanding of context and a willingness to continue refining. Arming oneself with technical and practical information will go a long way toward reducing anxiety and increasing competence. Once competence is attained, education of the community and leveraging of AI can occur.

A black box model is not a substitute for the skills, expertise, transparency, and nuanced judgment an experienced IR/IE professional can provide. Thus, an IR/IE professional's responsibility must extend beyond just describing these models to stakeholders. It is crucial to educate users about their underlying methodology and limitations. Practitioners can offer clarity and insight to campus community members, and can equip them with knowledge of these models' capabilities and limitations. This understanding can empower stakeholders to make informed decisions about the use of AI.

Ethical Deployment

The significance of ethics in AI usage, even when using publicly available tools, cannot be overstated. Upholding ethical principles is essential at all stages of AI adoption, from selecting the right tool, to understanding data needs, to deployment of AI in daily operations. Collaboration across institutional teams is crucial to maintaining these ethical standards. IR/IE professionals can foster interdepartmental cooperation, thus ensuring that AI tools are used responsibly and ethically, in line with the best interests of campus stakeholders. Soliciting campus feedback can broaden and diversify perspectives on AI tool use. Facilitating open dialogues on AI ethics can stimulate ethical mindfulness. Finally, establishing training sessions on AI ethics can strengthen awareness and responsible usage.

Privacy and Confidentiality

When using generative AI tools, IR/IE professionals can establish privacy and confidentiality by first understanding existing tools and their privacy policies. IR/IE professionals can then adapt a range

of established research protocols to protect user data further and to limit exposure. These protocols include practices like data minimization, where only the necessary data are input into the AI tool. This technique reduces the risk of privacy breaches. Another approach would be to anonymize any personal data before they are input into the tool. A third protocol would be to obtain informed consent when sensitive data are used, even when personal identifiers are removed. Furthermore, educating staff on privacy and responsible AI use is essential. Finally, one should not hesitate to consult with legal counsel to ascertain that all necessary precautions are being taken.

Bias and Fairness

IR/IE professionals know that bias can be introduced at multiple stages of the research process and must be managed (Roulston & Shelton, 2015). Likewise, bias can be inserted at multiple points in AI models and must be mitigated. Bias can be hidden in the training data, algorithms, and the subjective choices of their creators. In her TED Talk, Cathy O'Neil (2017) challenged the common perception that algorithms were objective, and asserted that algorithms were influenced by the biases of their designers. The same protocols to mitigate bias in research can also be applied to AI use.

IR/IE offices can adopt several measures to minimize bias and enhance fairness when using publicly available generative AI tools. One of the first steps is to carefully review and select the tools to be used. It is essential to choose tools with a reputation for fairness and transparency. The selection process can include reading reviews and studying case studies to make an informed choice. Once the right tools have been chosen, it must be understood that the process can still be contaminated with biased input data. Practitioners must ensure that the data fed into these models fully represent the populations and scenarios to be considered. Additionally, practitioners must use professional judgment when interpreting and presenting results. Involving key stakeholders at each stage can help ensure that diverse perspectives are considered.

Accountability and Responsibility

Working collaboratively with campus colleagues, IR/IE professionals can help drive the discussion on AI accountability. These dialogues should not be theoretical but rather should be grounded in specific use cases. They must identify who will take responsibility when an AI system inflicts harm or commits a significant error (Dignum, 2018). For example, someone must be willing to take responsibility if an AI tool is used to make an incorrect prediction that impacts a student negatively. Comfort in taking responsibility will require proficiency with the AI tools used, the establishment of clear guidelines for usage, and clear communication with other stakeholders. IR/IE professionals can facilitate all of these steps.

Furthermore, a review mechanism and an appeal process should be established to evaluate decisions informed by AI. Finally, a strategy to ensure accountability is to include third-party audits. External evaluators bring an objective perspective and use distinct methodologies and frameworks for assessment. These auditors serve as a safeguard, adding another layer of scrutiny to AI usage and decision-making processes.

Transparent and Explainable Artificial Intelligence

Transparency is necessary for developing trust among student, administrative, and faculty stakeholders. Furthermore, transparency is a fundamental principle that underpins robust and credible research. Extending this principle to AI is relevant and necessary. IR/IE professionals can champion the need for transparent and explainable AI. It is difficult to achieve transparency when dealing with something that is continually evolving. Examining the issue from a legal perspective, Miriam Buiten (2019) acknowledged this difficulty and proposed a practical solution: instead of creating new regulations for a rapidly changing field, Buiten recommended the application of existing regulations from a more familiar but related area. Likewise, IR/IE practitioners can follow a similar strategy by applying the established principles of good research design to AI use. One does not need to be an AI expert to ensure transparency. IR/IE professionals can uphold the principle of transparency by assisting with tool selection, researching methodology, maintaining open communication with the community, and being an example of ethical and responsible use.

Student Involvement and Communication

As discussed by Emily Oakes, Yih Tsao, and Victor Borden in their article in this volume, it is critical to incorporate the student voice in the work of student success. Student voice refers to individual students' and student groups' values, beliefs, perspectives, and cultural backgrounds. Higher education professionals must listen to, learn from, and respond to the collective student voice. Unfortunately, a recent meta-analysis of media articles on AI's impact on higher education found little mention of the student voice (Sullivan et al., 2023). Instead, the dominant discussion focused on institutional concerns about academic integrity. This oversight must be corrected. Together with their peers in student affairs, IR/IE practitioners with qualitative research backgrounds can help lead the discussion. Involving and communicating with students about AI tools that affect them is crucial. It is important to seek methods to educate students about these AI tools involved in their education, emphasizing their rights, benefits, and potential risks.

Develop Institutional Policies for Artificial Intelligence

Finally, having articulated policies and procedures can help guide the campus community toward responsible AI use. I agree with Webber and Zheng (2020) that change is best facilitated through campus-wide strategies. This guiding strategy should include rules for data collection and usage, principles establishing AI transparency, directives for setting data use parameters, processes for initiating the ethical review of AI tools, and mechanisms for ensuring accountability across one's campus or organization. Such policies would not only uphold institutional integrity but also enhance the effectiveness and value of AI in supporting data-informed decisions and optimizing institutional outcomes.

CONCLUSION

AI will be increasingly impossible to ignore. Microsoft, Google, Adobe, and other architects of the digital ecosystem have already begun to embed AI into their existing applications (Microsoft, 2023). Being a passive spectator is neither optional nor tenable. Fortunately, the frameworks and skillsets that have enabled IR/IE professionals to thrive in their current roles can empower them to transition from mere observers to key influencers during this technological revolution.

It is essential to remember that the tools now considered indispensable to IR/IE professionals were once enigmatic and unfamiliar. The same strategies used to master data visualization, business intelligence, statistical analysis, and data science can be used to leverage AI. Armed with research expertise, ethical commitment, data-informed decision-making knowledge, and a profound belief in human insight, IR/IE professionals stand ready to both adapt and lead. By harnessing this unique combination of skills and perspectives, IR/IE professionals can confidently step into the future and remain valued leaders in the higher education community.

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