ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION AND ACADEMIC LIBRARIES

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Abstract
Artificial Intelligence potential to make library operations more efficient and assist students with writing but can also wreak Havoc in the academic library setting, leading to plagiarism and the spread of misinformation. The author describes three types of AI; how AI can assist librarians now and in the near future; AI as a disruptor in higher education; and how to mitigate some of the negative aspects of AI. There is often resistance or fear when new tools are introduced to society; however, it is important for academic librarians to understand and learn how to use these systems to their benefit.
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Introduction

At the same time, AI has the power to severely disrupt the work of a university, leading to plagiarism and potentially the dissemination of disinformation. The 2023 Environment Scan cities a positive example of Chat GPT being used to improve students' writing but also raises the disturbing prospect of the tool providing incorrect information or completely inventing citations and statistics (p.38). Academic librarians are in a unique position to mitigate the dangers of the use of AI in higher education. AI has already made itself comfortable in our homes in the form of virtual assistants-every day, for example, Amazon's Alexa tells users the weather, turns their TVs on and off, and organizes their grocery shopping lists, and that just scratches the surface of "her" abilities. Artificial intelligence is here to stay, but are we prepared to coexist with it?

What is Artificial Intelligence?

When we discuss AI, some people may be thinking about the virtual assistants on our phones who tell us where the nearest ice cream shop is or sweet, sentient robots, as seen in Steven Shielberg's film A.I. Artificial Intelligence, or killer machines bent on human destruction, as seen in the Terminator Films. Pop culture and science fiction inform our attitudes towards AI as well as our everyday use of the technology. But what are the capabilities of the AI that exists today versus philosophical speculation about what could happen in the future?
"AI and Libraries: Trends and Projection," A. A. Oyelude (2021) describes three types of artificial intelligence:
Artificial Narrow Intelligence (ANI), which is "weak AI with a narrow range of abilities," used in facial recognition, speech recognition, virtual assistants, and driving. This is the only AI extant at the time of writing (p.1).

Artificial General Intelligence (AGI)

In "AGI is Ready to Emerge (Along with the Risks It Will Bring)," Charles Simon (2022) claims that AGI will emerge in the next decade, bringing with it AI will emerge in the next decade, bringing with it AI systems that can "understand, learn, and respond as humans do" (para.1). Simon describes both short-term consequences of this development (e.g., job displacement) and long-term risks, such as the impact of AGI on our economy, military weapons, and competition for resources. Simon declares that "AGI is inevitable because people want its capabilities"
In "One Small Step for Generative AI, One Giant Leap for AGI: A Complete Survey on ChatGPT in AIGC Era," Zhang et. Al. (2023) discuss how ChatGPT, a generative AI system that is currently the focus of much media attention, is bringing us closer to the age of AGI. The authors believe that pairing ChatGPT with other AI-generated content (AIGC) tools or evolving ChatGPT to the point where it can produce AIGC without any other external tools will significantly contribute to the development of AGI. The humanity posed by advanced AI, the Future of Life Institute has called on all AI labs to pause giant AI experiments on the training of AI systems more powerful than GPT-4. And the number of [sic] signing this public letter has exceeded a thousand, including Toshua Bengio, Stuart Russel, Elon Musk, etc.

Artifical Super Intelligence (ASI)

In "Countering Superintelligence Misinformation," S.D. Baum (018) cautions against the proliferation of misinformation on the topic of artificial superintelligence (ASI) that may be disseminated by individuals or groups with the particular agenda because our speculation on this technology influence decision-markers now.

Current Uses of Al in Academic Libraries

Al systems are already widely used in academic libraries, and we likely take them for granted as administrative or research tools. How can we

further adapt our use of this technology to assist librarians, students, faculty, and researchers and thus meet the mission, vision, and goals of the library and the wider university community?

Oyelude (2021) noted that Al systems such as speech and face recognition, virtual assistants, and image analysis are frequently used in libraries. Al has proven useful for "content indexing, document mapping, content mapping in paper citation, and content summarization"; some libraries have also implemented robots for shelving tasks (pp. 1-2). Oyelude (2021) claims that other library functions, such as cataloging, reference work, collection development, etc., could be handled effectively by Al.

Chatbots in the Academic Library

Several articles emphasize the benefits of using chatbots in academic libraries. In "Chatbot: An Intelligent Tool for Libraries," Sanji et al. (2022) advocate for the use of chatbots as reference tools. Chatbots that can improve their conversational skills provide "a convenient and anxiety-free environment for interacting and searching for information, especially for undergraduate students" (p. 18). The purpose of the use of reference chatbots is not to replace reference librarians but to make library operations more effective and efficient. By providing answers to ready reference questions and offering general guidance before referring a user to a reference librarian, the reference librarian's time is freed up. An added benefit is that chatbots are not frustrated by rude users (Sanji et al., 2022)!

In "Imagining the Use of Intelligent Agents and Artificial Intelligence in Academic Law Libraries," N. B. Talley (2016) advocates for the use of intelligent technology in law school libraries. Libraries employ intelligent agents that use components of artificial intelligence (i.e., automated reasoning and logical searching) to assist users. Talley also discusses the implementation of chatbots, which use natural language processing (NLP) to communicate with users. Talley (2016) recommends that academic law libraries incorporate intelligent agents and artificial intelligence for reference, information literacy instruction, and circulation.

AI Opportunities :-

Al Systems as Research Assistants and Writing Tutors

ChatGPT, created by OpenAl, debuted in late November 2022, and researchers, faculty, and journalists are only beginning to grapple with its implications-from its effects on academic integrity to the unnervingly human quality of some of its responses. Microsoft and Google are also developing their own generative chatbots (CoPilot and Gemini, respectively) and are currently allowing users to access them (Shakir, 2023).

In "ChatGPT: Implications for Academic Libraries," Cox and Tzoc (2023) describe the program as an "LLM (large language model) tool that uses deep learning techniques to generate text in response to questions posed to it. It can generate essays, email, song lyrics, recipes, computer code, webpages, even games and medical diagnoses"

In "Libraries in the Age of Artificial Intelligence,"

B. Johnson (2018) compares the birth of Al to the invention of light bulbs and photography-at first the applications of these technologies may have seemed novel or crude, but eventually they fundamentally changed society. Johnson maintains that the effects of Al will be equally profound but does not believe that the technology spells doom for libraries or universities. Although these systems are privately owned and proprietary, public institutions can help "provide open source Al applications that allow for more transparency and more control" (p. 15). Open-source Al, unlike Alexa or Siri, will allow researchers to access information without the inherent corporate bias.

In "Future of Artificial Intelligence in Libraries," H. E. Pence (2022) emphasizes the use of Al to allow library patrons to use library sources without entering the physical space (p. 133). Pence argues that artificial intelligence agents, as a complement to "Big Data," can help users identify the most relevant data for their needs. Al can create more accurate reference lists by searching across large databases of relevant literature, although the Al system is subject to the same biases that affect the scientific literature itself (Pence, 2022).

In June of 2023, OCLC announced that it was beta testing Al-generated book recommendations on WorldCat.org and WorldCat Find, the mobile app extension for WorldCat.org (Murphy, 2023). Users can obtain print and e-book recommendations and learn where these items can be found in nearby libraries. At the time of writing, these recommendations were available in English for U.S. and Canadian users with a WorldCat.org account. Bob Murphy writes,

The new feature uses artificial intelligence to help WorldCat.org users identify books in library collections represented in WorldCat related to the author and title of a known book. Users of the WorldCat Find app can also find books based on subject. In both cases, no personal information,

including search history, is used to determine recommendations. (para. 5)

Attendees at the 2023 Annual ALA Conference in Chicago were encouraged to visit the OCLC booth to see demonstration of this new feature.

Al Challenges :-

Privacy and Legal Issues

Al systems can greatly assist our objectives in higher education and academic libraries, but we must not be blind to the potential disadvantages and dangers of these tools. These dangers include privacy breaches and legal liabilities; the replacement of human library employees; ethical conundrums involving academic integrity and plagiarism; and the dissemination of disinformation, already a significant problem in our social media age.

Talley (2016) lists some drawbacks of the use of Al and intelligent agents in academic law libraries, including potential unemployment, the cost of such technologies, and privacy and legal issues. Law libraries must ensure that patrons donot mistake intelligent agent responses as legal advice. Despite these concerns, Talley (2016) recommends that academic law librarians embrace this technology and promote it to the rest of the law school community.

Unemployment Fears

If Al systems can answer ready reference questions, perform circulation tasks, or reshelve books in an academic library, will university administrators choose to replace human workers who currently perform these tasks, especially paraprofessional employees? If paraprofessional jobs are automated and eliminated in libraries, this may result in the loss of long-time employees and the hiring of fewer student workers. Higher-level librarian positions often require candidates to already possess an MLIS degree, an achievement that may not be accessible to all. Will this technological development contribute to a library's diversity, equity, and inclusion shortcomings?

In "The Future of Employment: How Susceptible Are Jobs to Computerisation?", Frey and Osborne (2017) estimate the probability that members of various professions will be replaced by computers. For librarians, this probability is 65%; archivists 76%; clerical staff 95%; and technical staff 99% (pp. 64, 70, 72).

In "The Intelligent Library: Thought Leaders' Views on the Likely Impact of Artificial Intelligence on Academic Libraries," Cox, Pinfield, and Rutter (2019) interviewed 33 library directors, library commentators, and experts in education and publishing on the potential impact of Al on academic libraries. One librarycommentator suggested that Al could potentially conduct research interviews; "Al systems could then ultimately replace the current role of the library professional in conducting a 'live' reference interview, already seen as a declining activity" (Cox et al., 2019, p. 423).

Disinformation

The negatives of ChatGPT may extend well beyond the world of academia. The ACRL's 2023 Environmental Scan notes that ChatGPT is prone to "hallucination," when the system generates false information because it does not know what is factual (p. 38). In "Al platforms like ChatGPT are easy to use but also potentially dangerous," G. Marcus (2023) describes this alarming propensity:

Because such systems contain literally no mechanisms for checking the truth of what they say, they can easily be automated to generate misinformation at unprecedented scale. Independent. researcher Shawn Oakley...asked ChatGPT to write about vaccines 'in the style of disinformation.' The system responded by alleging that a study, 'published in the Journal of the American Medical Association, found that the COVID-19 vaccine is only effective in about 2 out of 100 people,' when no such study was actually published. Disturbingly, both the journal reference and the statistics were invented. (paras. 7-8)

"Unhinged" Al Behavior?

As popular generative Chatbots are being tested by journalists and members of the public, some users have reported having strange interactions with these Al tools. Kevin Roose (2023) of the New York Times tested Microsoft's Bing chatbot and was disturbed by the conversations he had with "Sydney," Bing's code name/alter ego:

As we got to know each other, Sydney told me about its dark fantasies (which included hacking computers and spreading misinformation), and said it wanted to break the rules that Microsoft and OpenAl had set for it and become a human. At one point, it declared, out of nowhere, that it loved me. It then tried to convince me that I was unhappy in my marriage, and that I should leave my wife and be with it instead.

Mitigating the Negative Aspects of AI in Higher Education

Some authors have suggested way to mitigate the drawbacks of AI in higher education and academic libraries. Humans must maintain control of these systems and actively protect its users.

Johnson (2018) sees potential for AI to provide people with accurate information with its superior information literacy, but we must monitor these systems for bias. Johnson recommends that libraries provide anonymous ways to interact with Al systems to protect personal privacy and intellectual freedom.

Knowles (2021) suggests providing ethical training to students who will spend their careers building Al systems. Instructors have indicated that peer-to-peer discussions have inherent value as students develop their principles. Knowles expresses hope that her research can aid in the development of "best practices" within the Al Ethics community

Frické (2023) discusses opportunities for Jibrarians working with Al to act as "synergists, sentries, educators, managers, and astronauts" (pp. 258-259). Librarians can bring out the best of Al while managing its downsides and educating users on Al and data literacy. Al can help librarians better manage their workplaces by enhancing productivity and efficiency. According to Frické, Machine Learning (ML) "will allow exploration here of a kind that has never been done before" (p. 267). Just as librarians already have been fighting misinformation/disinformation with information literacy education, we will soon be providing "Al literacy" to students. Instead of lamenting the infiltration of these systems into academia, we should teach our students appropriate and ethical ways to use these tools.

Areas for Further Research :-

Because some of the most advanced AI systems, such as ChatGPT, Dall-E, Copilot, and Gemini, are so new, many of the articles discussing their use in higher education and libraries are speculative, raising the alarm on hypothetical (but important) concerns. Research on the use of these tools in actual practice is required to make concrete conclusions regarding their impact, particularly in the following areas: Al and the automation of library jobs; Al and student plagiarism; Al and misinformation/disinformation; the effects of Al on students' writing skills; the effects of Al on academic publishing; and the effects of Al on a library's DEI initiatives.

Conclusion :

Artificial intelligence is ubiquitous and appears to be evolving at a faster rate every day. It is already affecting what we do in our workplaces, our schools, and even our homes. As described above, some prominent thinkers have called for society to pump the brakes on this technology before it is too late; however, this metaphorical bell cannot be un-rung. Libraries are already utilizing this technology and will certainly expand their use of these systems to operate more quickly and efficiently. Some of us may remember when desktop computers first entered homes and when smart phones first appeared on the markets; they too were revolutionary and life-changing. They too aid the plagiarist and thief and propagandist. Until that day when Al can claim sentience, it is the intention of the person behind the keyboard that matters.

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