Chapter 5

Separating Artificial Intelligence from Science Fiction:

Creating an Academic Library Workshop Series on AI Literacy

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Introduction

As artificial intelligence (AI) becomes more prominent in everyday conversations, it is critical for library users to develop basic knowledge and understanding of those technologies. In academic libraries, subject liaisons play a central role in the teaching of concepts like information literacy, open access, and research data management, in addition to their subject responsibilities. It should be no different, then, for these liaisons to take on the charge of learning and communicating the ways in which AI applications can change the research landscape for users. Two obvious challenges present themselves here: a lack of computational knowledge regarding AI and a lack of funds needed to develop a program of support. In this chapter, the authors present a model of AI engagement with users that is accessible for all knowledge backgrounds and is low-cost. With these two requirements in mind, a workshop series, Keeping Up with Artificial Intelligence, was created at the McGill University Library by two liaison librarians. The workshop series features three sessions: AI Literacy, AI Ethics and Bias, and AI in Research. The central premise of each

workshop is to connect users from the community in discussions about AI so that all participants may leave with a richer understanding of the topic and how it may influence academic research.

Information Literacy and an AI Equivalent

The concept of information literacy (IL) has been constantly evolving since its initial invocation in the National Commission of Libraries and Information Science in 1974 by Paul Zurkowski.[1] The need to define information literacy and promote it as a skill needed by researchers was brought on by the rapidly increasing volumes of information being published. The amount of information available to the public predicated a desire on behalf of librarianship to assist in the navigation and evaluation of this information in order to support a more literate community.

In 1989, the American Library Association released the Presidential Committee on Information Literacy: Final Report, which posed the Information Age as one of the greatest challenges of the day.[2] They defined the information-literate person as one who "must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information."[3] For years, scholars have worked to expand on these preliminary remarks, leading to the current *Framework for Information Literacy for Higher Education* created by the Association of College and Research Libraries.[4] The *Framework*'s six threshold concepts—authority is constructed and contextual, information creation as a process, information has value, research as inquiry, scholarship as conversation, and searching as strategic exploration—have become canonized in the work of academic librarians.[5] Institutions have been hiring information literacy librarians for some time, a position that would require these librarians to promote and teach IL principles and values. Among these librarians, it is notable that each can approach the concept of IL and its definitions in varying ways. In Celene Seymour's 2012 study of IL librarians' work experiences, the author found that the rapid advances in technology and instant access to information were shifting the IL landscape for many librarians.[6]

It is not just information literacy that has taken the forefront of librarianship, the past couple of decades have also led to a rise in other literacy concepts, such as media, data, financial, and digital literacy. Librarians have taken up the challenge of teaching and supporting skills in these areas to varying degrees. Media literacy has become closely tied to IL practices, and following the United States' 2016 presidential election and the rise of "fake news," librarians all over the world saw occasion to promote media literacy and awareness to their communities. All one needs to do is take a look at LIS conference themes or programs over the last four years to be sure that this resurgence in media literacy (whether it is outwardly labelled that or not) has had an unprecedented impact on the profession.

While media literacy may have made the most noise among librarians, data and financial literacy have also made a resounding impact. Though financial literacy education

tends to appear more in public libraries, it does have its space in the academic arena. Data literacy, on the other hand, has been ever-increasing in prominence. Tibor Koltay established data literacy as "a specific skill set and knowledge base, which empowers individuals to transform data into information and into actionable knowledge by enabling them to access, interpret, critically assess, manage, and ethically use data."[7] Koltay argued that even the label of data literacy was important as its lexical relationship with information literacy invokes the same importance to library users.[8] By comparison, the term *artificial intelligence literacy* has received much less recognition. Its use has been limited to small circles of education or computer science fields in recent years but has yet to become an established concept within librarianship. The authors of this chapter put forward AI literacy as a necessary distinction among the other concepts, especially digital literacy.

In 2019, researchers David Touretzky, Christina Gardner-McCune, Fred Martin, and Deborah Seehorn posed five "Big Ideas" in AI that could be used as guidelines to teach students in K-12 programs about AI. These initial competencies are as follows: (1) computers perceive the word using sensors, (2) agents maintain models/representations of the world and use them for reasoning, (3) computers can learn from data, (4) making agents interact comfortably with humans is a substantial challenge for AI developers, and (5) AI applications can impact society in both positive and negative ways.[9]

The first substantive use of AI literacy, however, came about in the work of Duri Long and Magerko in 2020. Long and Magerko performed an exploratory review of AI literature in order to build their own set of competencies for learners.[10] They, too, cited the historical propagation of literacy concepts as a background for establishing AI literacy. Notably, only one source consulted on digital or data literacy was from a library journal. They define AI literacy, however, "as a set of competencies that enables individuals to critically evaluate AI technologies; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace."[11] Their conceptual framework includes five general themes with seventeen specific competencies and fifteen design considerations divided among said themes.

Where digital literacy might encompass topics like the evaluation and use of digital platforms, AI literacy is concerned with the advancing technologies that run those platforms. An AI-literate person can not only use their smartphone to access and create content on a social media platform, but they can also understand that certain features on those platforms are being embedded with AI technologies and speak to what those different programs can do. This separate distinction of AI literacy is built around the education of the public to better understand AI terminology and concepts and is encouraging them to become active participants with AI.

Building the Workshop Series

Given the importance of providing library users with artificial intelligence literacy, the authors created a series of three workshops called Keeping Up with Artificial Intelligence. Each two-hour session focused on different aspects of AI: AI Literacy, AI Ethics and Bias, and AI in Research. The workshops were developed at the McGill University Library

in Montréal, Québec, Canada; notably, Montréal has played a significant role in the AI community as one of Canada's most prominent research cities dedicated to the topic.[12] In creating the workshops, the authors were determined to take an approach that welcomed all levels of knowledge toward AI. Neither author had extensive computational knowledge of AI prior to the development of this project; however, both authors have committed time over the past few years to strengthen their understanding. Participation in the Elements of AI online learning course and in discourse with the Montreal AI Ethics Institute are just two of the ways the authors worked to increase their knowledge of AI.[*]

Both authors began developing the project as a way to enhance AI experiences and conversations within the library. As there was no budget to provide funds, the project outcomes needed to be achievable with little to no capital spent. Thus, the three-part series was created as the best way to begin offering AI support on campus. The workshops were initially offered in March 2020 and were open to all in the McGill University community. A disclaimer on the workshop description let participants know that no computational knowledge of AI was needed to participate. As a result of the COVID-19 pandemic, only the first workshop, AI Literacy, was offered before the university closure, and it was attended by thirty-six participants. The full series of workshops was offered again in October 2020 in an online format. The authors delivered the three workshops via Zoom and thirty participants attended the series. Participants were not required to attend all workshops; they could choose to attend only one or multiple. The small number of participants enabled dynamic conversations in each of the workshops which were well received by the attendees.

AI Literacy

The first workshop in the series was an introductory session into AI technologies and knowledge competencies. As definitions of AI are crucial to the understanding of the topic, the workshop covered an exploration of AI terminology, participation in a Turing test, an evaluation framework, and the analysis of case studies on the use of AI in public practices.

Family Tree

In AI education, a metaphor often used to show understanding of the different capabilities of these applications is to compare artificial intelligence to human intelligence. However, AI technologies are often more complex and can be represented in their own frameworks. To convey these relationships, the authors created a family tree model to create a network of AI terminology as seen in figure 5.1. Specifically, the use of the infamous Kardashian family was used to not only provide levity to the complexity of AI relationships but also to make parallels between extended families and interdisciplinary

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[*] Elements of AI, see: https://www.elementsofai.com/; Montreal AI Ethics Institute, see: https://montrealethics.ai/.

fields.† The break between AI and machine learning is a perfect example of contention within the field regarding whether these two areas should be interrelated or distinct. The family tree metaphor affords the learner the opportunity to see how these relationships intersect and diverge.
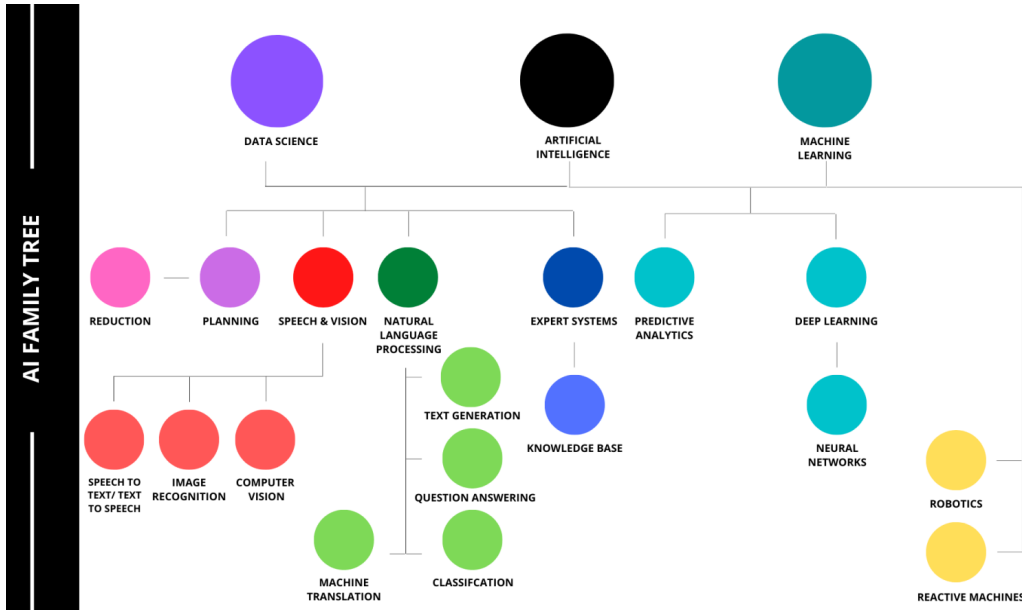

Figure 5.1
Family tree graphic of the relationship between artificial intelligence and other technologies.

ROBOT Test

Another important aspect of AI literacy is the ability to critically assess the information that is produced about AI technologies and the implications they can have. In order to help participants remember which aspects should be evaluated, an acronym was created. Much like the widely used CRAAP test, the ROBOT test enables its users to remember which questions to ask when encountering new information about AI technology.[13] ROBOT stands for reliability, objective, bias, ownership, and type. The authors created the ROBOT test to encourage its users to not only question and assess the information that they read about AI technologies but also to evaluate the technology itself. A complete outline of the ROBOT and the questions it prompts the user to ask can be found in table 5.1.

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† The Kardashians are a well-known multi-generational blended family who were profiled in a reality television series, *Keeping Up with the Kardashians*, that ran for 20 seasons from 2007–2020.

Table 5.1
The ROBOT test components used as criteria when evaluating sources on AI

Reliability	• How reliable is the information about the AI technology?
	• If it's not produced by the party responsible for the AI, what are the author's credentials? Is there author bias?
	• If it is produced by the party responsible for the AI, how much information are they making available? Is information only partially available due to trade secrets? How biased is the information they produce?
Objective	• What is the goal or objective of the use of AI?
	• What is the goal of sharing information about it? To inform? To convince? To find financial support?
Bias	• What could create bias in the AI technology?
	• Are there ethical issues associated with this?
	• Are biases or ethical issues acknowledged? By the source of information? By the party responsible for the AI? By its users?
Ownership	• Who is the owner or developer of the AI technology?
	• Who is responsible for it? Is it a private company? The government? A think tank or research group?
	• Who has access to it? Who can use it?
Type	• Which subtype of AI is it?
	• Is the technology theoretical or applied?
	• What kind of information system does it rely on?
	• Does it rely on human intervention?

After introducing the ROBOT test to the participants, the authors distributed two recently published newspaper articles that discussed AI. They used the first article as an example to show participants how to properly assess the information and the technology. The participants were then asked to work in small groups to evaluate the second article according to the criteria of the ROBOT test.

AI Ethics and Bias

The second workshop in the series focused on the ethical issues and biases that can be present in AI. Given that participants were not required to attend all workshops, the librarians first provided an overview of AI terminology and the AI family tree to ensure that all attendees had the basic knowledge to be able to understand and participate in the workshop. They then introduced two newspaper articles as case studies to showcase possible ethical and privacy issues in AI. The first case study focused on an algorithm that was negatively biased toward people of colour.[14] The second one discussed privacy concerns with popular mass-market voice assistants, such as Google Home, Amazon Alexa, and Apple's Siri.[15] The authors provided the participants with some discussion questions about

these case studies and encouraged them to discuss their implications for everyday life. The participants were then encouraged to brainstorm some possible solutions to ethical and privacy issues in AI technologies.

Following the introduction of ethical and privacy concerns, the authors provided an overview of some of the governmental legislation in place that can regulate the use of information and AI technologies. They also introduced participants to the OECD AI Policy Observatory.[16] The workshop participants worked in small groups to compare their own ideas to mitigate the ethical and privacy issues in AI with the legislation currently in place. The authors followed this activity with a presentation of the approaches of two different organizations engaged in AI: ElementAI and OpenAI. These two groups showed a contrast in producing transparent ethical statements regarding the development of their technology (the latter) and a commitment to the broad adoption of AI for economic benefit (the former).[17] Participants were encouraged to evaluate and reflect on the statements produced by these types of AI research groups and the products they developed. The authors wanted to stress that conversations on AI ethics should not just extend to concerns of how they are used (biased training data being a popular discussion example), they should also include considerations on the ethics of the researchers themselves.

AI in Research

The final workshop in the Keeping Up with Artificial Intelligence series, AI in Research, was not aimed at discussing research on AI but rather the implications of using AI applications during the research process. The authors asked participants to consider if they had ever used AI to augment their research process while discussing notable case studies. Some examples included the use of CrossRef technologies to review and reject journal submissions; TrendMD's article recommendation system, which is prominent in many journal databases; and the Semantic Scholar, which uses natural language processing for article searching.

Academic libraries are seeing a rise in the presence of digital scholarship on campuses and have grown to support this through the creation of librarian positions dedicated to the area and even the creation of technological hubs or centres where users can interact with new applications.[18] Already, the work that libraries have been doing is complementing the support of artificial intelligence as most applications involved in digital scholarship will include AI technologies. An example the authors explore in the workshop is that of Voyant, a text analysis and visualization tool geared toward the digital humanities.[*] Academics implementing Voyant in their research process may be unaware that it is a machine learning application that falls underneath the umbrella of AI.

While it is not feasible to ask a researcher to understand the code that makes up a program such as Voyant, it is important for them to understand the core roots of the software. Users of these programs are receiving aid to their research process; they may have a tacit understanding of the exchange of information that is taking place, but no focal knowledge of the subset of AI being utilized. The use of AI technologies is now prevalent

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[*]   Voyant, see: https://voyant-tools.org/.

in so many applications that it is nearly impossible to avoid its use in research. To help academics plan for AI augmentation, the authors prompted them to consider adding pointed questions on these topics into already existing research data management plans. A template of questions researchers can use in their planning process is presented below.

- How will you acknowledge the use of AI?
- Methods? Results? Discussion?
- What are the ethical and privacy concerns?
- If you are dealing with participant data, how will you protect, store, and anonymize it?
- Do you have permission to use this AI?
- How will you acknowledge it? Citations?
- Will your experiment and results be reproducible?
- Who is this AI available to?
- Open access versus proprietary?
- What is the level of oversight and verification?

Lessons Learned

The process of creating a workshop series proved to be a great learning experience for both authors. The participants' enthusiasm during the discussion portion of the March workshop was quickly noted; therefore, they decided to increase the length of the workshops from one-and-a-half hours to two hours to give attendees more time to engage in stimulating conversations. This change would have worked well for the in-person workshops; however, the authors noticed that conducting the session online sped up certain elements, like handing out papers and organizing participants into discussion groups.

The authors hope to increase marketing for the workshop series. After a high level of enthusiasm in the spring, attendance was lower for the fall sessions. It is possible that potential participants were tired of virtual meetings and classes; however, more efforts could be made to target groups with a possible interest in AI. The authors are investigating social media promotion through the library's accounts as well as advertising through student email lists.

While the workshops provide a basic understanding of AI literacy to its participants, the authors aim to build a more formal framework for artificial intelligence literacy. Similar to the ACRL *Framework for Information Literacy for Higher Education*, this framework would highlight the main competencies and attitudes that users should engage with. Special attention will be given to making the framework applicable and attainable by librarians in different institutions who have varying levels of knowledge of AI.

The authors will continue to offer the workshops at least twice a year and adapt the content to the ever-changing information landscape about artificial intelligence. The authors also aim to introduce a new workshop component where participants can engage directly with AI technologies, such as voice assistants, and evaluate their performance.

Conclusion

As society's interest and involvement in AI technologies continues to grow, the importance for individuals to be AI literate has never been higher. While academic librarians may feel unprepared or reluctant to teach their communities about artificial intelligence, it is possible to do so without expert knowledge or a computer science degree. Much like with digital, data, or media literacies, librarians can use their expertise and analytical skills to inform users and help them understand the implications of AI. Librarians are also known for their adaptability and willingness to learn, which makes them perfect candidates to adopt and teach AI literacy. The authors piloted a series of workshops that introduced users to the main topics related to AI, such as basic literacy, ethics and bias, and implications for research. While emphasis was placed on topics that would be relevant to the academic library community, similar workshops could be designed with different populations in mind. The authors intend to continue developing the Keeping Up with Artificial Intelligence workshop series and to build a framework for artificial intelligence literacy. They hope to continue bridging the divide between science fiction and reality.

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