

## The Intersection of AI, Information and Digital Literacy: Harnessing ChatGPT and Other Generative Tools to Enhance Teaching and Learning

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### Abstract:

*This paper highlights the importance of AI literacy in higher education and the role of librarians in fostering research skills development with AI literacy as part of information literacy. Faculty and students must understand the benefits and drawbacks of AI tools to use them responsibly and effectively. Librarians, as digital and information literacy experts, can significantly contribute to this evolving field. The authors provide recommendations for integrating AI literacy into existing curriculums, emphasizing the need to create lesson plans that encourage the critical and ethical use of AI tools, enabling students to produce new knowledge while developing their digital skills.*

**Keywords:** AI Literacy, ChatGPT, Information Literacy, Digital Skills

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It has become increasingly apparent that artificial intelligence (AI) tools are causing significant disruptions within higher education and creating new opportunities for innovation. As faculty and students prepare for life with ChatGPT and other AI-generative tools, educators are actively deciding whether to embrace or reject this technological innovation and determining the next steps. As AI tools become more accessible, it is important for the university community to receive training on their use and capabilities. Faculty, students, and staff must comprehend the pros and cons of AI and other generative tools for ethical and effective usage and to fully harness their power. Therefore, developing AI literacy is vital, and this is where librarians can make a significant contribution to the quickly evolving learning landscape. Librarians have been at the forefront of advocating for and promoting information and digital literacy. A growing body of research suggests that AI literacy and the

development of digital skills will be the next frontiers in preparing students for educational endeavors in and beyond university life. This paper discusses the importance of AI literacy for faculty and students and provides recommendations for integrating it into information and digital literacy curricula. It also suggests using innovative tools as part of lesson plans to develop students' digital skills, enabling them to use generative tools with a critical and ethical approach to producing new knowledge.

To move the discussion of AI literacy and digital skills development forward, it is important to define the concept of AI literacy and why libraries and the larger university community cannot overlook it. AI literacy refers to “a set of competencies that enables individuals to evaluate AI technologies critically; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace” (Long & Magerko, 2020, p.598). It is essential to note that AI tools do not replace actual human intelligence. Instead, they serve as an aid in the creation of knowledge. Digital literacy is “the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills” (American Library Association, para. 1). Libraries have the potential to make the most impact by championing the intersection of AI, digital, and information literacy. They can achieve this by developing educational resources and modules that teach individuals how to utilize emerging technologies with advanced levels of proficiency effectively. This intersection of skills and technology mastery empowers students to engage in lifelong learning and prepares them to think critically while navigating the potential risks associated with generative tools.

## **Higher Education and AI-Generative Tools**

Within higher education specifically, there is an increasing amount of literature on AI tools and recommendations on their use in higher education. Rudolph et al. (2023) discuss artificial intelligence in education (AIEd) and its “potential to revolutionise the way we learn and teach” (p.350). Sabzalieva and Valentini (2023), authors of the United Nations Educational, Scientific and Cultural Organization’s (UNESCO) ChatGPT and artificial intelligence in higher education quick start guide, offer an overview of ChatGPT and artificial intelligence and provide higher education institutions with guidance on their potential application. According to Sabzalieva and Valentini (2023), “ChatGPT can play a range of roles in teaching and learning processes. Together with other forms of AI, ChatGPT could improve the process and experience of learning for students” (p. 8). In addition, these authors offer suggestions on the role ChatGPT can play in enhancing the process of teaching and learning. Some examples mentioned include using ChatGPT as a possibility engine to generate ideas, as a personal tutor to offer feedback, as a co-designer to assist with the design process, as a study buddy for reflection and learning, as a motivator to help extend knowledge, and so on. (Sabzalieva & Valentini, 2023, p.9). Sabzalieva and Valentini offer many examples of how ChatGPT can be used in higher education but acknowledges the challenges and ethical implications. Many concerns arise when it comes to this technology and others like it. These include academic integrity concerns such as plagiarism and cheating, lack of proper regulation, privacy issues regarding personal information, and accessibility issues for those who do not have access due to government regulations or a lack of internet access. Other concerns highlighted by this report include cognitive bias and the fact that ethical principles do not govern ChatGPT. Another concern is ChatGPT’s inability to distinguish between right and wrong or true and false information (Sabzalieva & Valentini, 2023, p.11).

## Information Literacy, Digital Literacy, and AI Literacy

Librarians work with many different types of literacies in their day-to-day work, including information, digital, media, and data, among others. Some literacies, like information and digital literacy, are well-defined and have been developed over decades of use and reflection. Other literacies, including AI literacy, are relatively new and require work among computer scientists, librarians, and other stakeholders to understand better their application in the rapidly evolving higher education ecosystem. A useful approach to this challenge is to reflect on existing, well-defined literacies and explore how they intersect with the rise of AI literacy.

Information literacy is the most well-known and best-established literacy used by librarians. As exemplified by the ACRL's Framework for Information Literacy for Higher Education, the core idea of information literacy is to teach students a set of abilities that empower them as consumers and creators of information (Association of College and Research Libraries, 2015). Within the *Framework*, the definition of information literacy is given as:

“Information literacy is the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning” (Association of College and Research Libraries, 2015, p. 8).

In conjunction with this definition, the *Framework* provides a series of key concepts that are essential to information literacy and how they can be applied to help students become increasingly literate and savvy consumers and users of information. These concepts (or frames) include:

- Authority Is Constructed and Contextual
- Information Creation as a Process
- Information Has Value
- Research as Inquiry
- Scholarship as Conversation
- Searching as Strategic Exploration

The frames are described as a set of dispositions that should ground and orient students in their learning journeys (Association of College and Research Libraries, 2015, p. 8).

Building upon work done in the domain of information and other literacies, the concept of digital literacy has grown over the past several decades with the advent of computing and other digital technologies. As defined by UNESCO in their publication, *A Global Framework of Reference on Digital Literacy Skills for Indicator*, digital literacy is defined as:

“[T]he ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship. It includes competencies that are variously referred to as computer literacy, ICT literacy, information literacy and media literacy” (Law, 2018, p. 6).

Whereas digital literacy is mainly focused on interaction with digital technologies, there is still a strong emphasis on higher-order thinking processes that are core to information

literacy. This includes not simply using digital technology but being able to understand its role and effectiveness as part of the information creation process. For students, this means developing digital literacy competencies in areas such as information and data literacy; communication and collaboration; digital content creation; internet safety; and problem solving (Law, 2018, p. 7). Several of these overlap with information literacy competencies and show their affinity.

Against this background, AI literacy has in the past few years become increasingly important, particularly in light of the development of tools such as ChatGPT and Midjourney. The nature of what AI is and its potential to be a significant and disruptive technology makes developing greater AI literacy essential. Many scholars have already begun to develop what is meant by AI literacy. Earlier, we quoted Long and Magerko's definition of AI literacy. Likewise, in their paper on conceptualizing AI literacy, Ng et al. (2021) reviewed dozens of AI literacies developed throughout the world and found commonalities in how AI literacy is defined. First, they found that several competencies are important in the definition of AI literacy, including 1) how to know and understand AI, 2) how to use and apply AI, and 3) how to evaluate and create AI (p. 4).

What is important to note is that information literacy, digital literacy, and AI literacy have several points of intersection that are useful for librarians and other educators to incorporate this literacy into their instructional practices effectively. Some intersections are plain to see, such as the importance of computing in both digital and AI literacies. Long and Magerko write that "digital literacy is a prerequisite for AI literacy, as individuals need to understand how to use computers to make sense of AI" (2020, p. 2). Likewise, due to its nature, it's important to understand and evaluate AI in areas like privacy/surveillance; misinformation; ethical decision-making, diversity, and bias when using AI technologies (Long & Magerko, 2020). These types of understandings and evaluations are akin to traditional competencies espoused in information literacy, reflecting the intersection between information and AI literacy.

### **Librarians' Role at the Intersection**

Librarians, much like other professionals in higher education, are working to keep up with the impact of emerging AI technologies. However, since librarians are already skilled and knowledgeable in the areas of information literacy, many of the modes of engagement taken to discover, evaluate, and create information have their parallels in AI literacy. For example, AI has the potential to impact traditional areas of librarianship, such as search and discovery; reference and information services; cataloging and metadata generation; content creation (Lund & Wang, 2023). These are all areas in which librarians have well-established expertise and are poised to build upon this by adding AI tools and skills to their day-to-day workflows.

Furthermore, when librarians' expertise in information literacy is coupled with their increasing mastery of digital literacy, the foundation exists for librarians to integrate AI literacy into their skill sets with ease. In fact, scholars have identified the many ways librarians can provide value to students and faculty by teaching skills at the intersection of information, digital, and AI literacies.

Discovery and search are essential components of the services librarians provide to students, faculty, and staff. Librarians can integrate AI into the services they provide by assisting researchers with tips and techniques about how to ask AI the right questions to get the best

results (Oyelude, 2023, p. 16). Looking forward, it is also likely that AI will be integrated into commercial library discovery tools. Librarians will be essential to train users on how to interact with new AI tools and generate the best results (Cox & Tzoc, 2023, p. 99).

The information literacy skills librarians use when helping with reference will remain important. It is still essential for librarians to educate students on critical thinking and the assessment of the credibility of the information they find. However, library reference will evolve to include AI tools like ChatGPT and require librarians to teach users how to critically analyze and cross-reference the information produced (Oyelude, 2023, p. 16). This is an area that points clearly to the intersection of the different literacies. Essentially, the role of librarians will be to help teach “students critical thinking skills to validate facts and evaluate the quality of the answers provided by ChatGPT” (Cox & Tzoc, 2023, p. 100).

### **Critical Thinking**

When examining the intersection between information, digital technology, and AI literacy, it becomes clear that critical thinking is a fundamental skill. Competencies in this area have already been established through existing information and digital literacies. Teaching critical thinking skills is a widespread learning objective in higher education syllabi, and librarians also play a significant role by educating students about information and digital literacy skills, as indicated in the ACRL Framework for Information Literacy. Critical thinking skills are a component of the competencies required in the use of AI (Long & Magerko, 2020). Therefore, using AI with students should involve the integration of critical thinking skills.

Specific areas of interest concerning AI are recognizing bias, evaluating information found using AI tools, and identifying AI fabrications, also known as hallucinations. For example, A critical thinking skill that students will need to acquire is recognizing bias when it occurs in the content produced by ChatGPT. Due to the nature of how tools like ChatGPT are trained based on data collected from human-generated data, many biases are already built into the tool (Dwivedi et al., 2023, p. 51). Problems around bias can appear when AI produces representations of populations, gender, and ethnic representations (Cox & Tzoc, 2023). Being aware of the inherently biased nature of AI tools like ChatGPT provides an opportunity for librarians to develop critical thinking skills by identifying and reflecting on the biases produced ChatGPT.

Another opportunity to hone critical thinking skills with ChatGPT is by verifying the accuracy of the content produced by ChatGPT. Although ChatGPT is improving, at this stage of development, ChatGPT still produces non-existing sources or what is referred to as hallucinations. Hallucinations “refers to mistakes in the generated text that are semantically or syntactically plausible but are in fact incorrect or nonsensical In short, you can’t trust what the machine is telling you” (Smith, 2023, para 2). The role of librarians in teaching students how to fact-check and verify the accuracy and validity of sources is crucial. By promoting critical evaluation of content, including that produced by ChatGPT, students can develop their critical thinking skills and become aware that not all information they encounter can be trusted to be accurate and authentic. These are just a few examples of how librarians can use AI tools to help students improve their critical thinking skills. Applying critical thinking skills with the use of AI tools is essential and another way that librarians can help students become AI literate.

## **Involvement in the conversation about academic integrity standards and AI with other stakeholders on campus**

Collaboration between librarians and other university departments is essential to overcoming the challenges posed by ChatGPT and integrating its use in the classroom. Our library has started discussions with different stakeholders, and we have some examples that could benefit other university libraries looking for collaborators. The Writing Center is likely to be influenced by ChatGPT the most. McMurtrie (2022) predicts that AI tools like ChatGPT will become commonplace in everyday writing, similar to how computers and calculators have become part of math and science. Through our conversations with Georgetown University in Qatar's (GU-Q) Writing Center, we have identified frequent concerns regarding the citation of AI content, particularly when using tools like Zotero. Recently, MLA, APA, and Chicago have all tackled this issue in their respective styles. However, their guidelines contradict each other, with some suggesting that AI-generated content should be treated like an interview, while others consider it as software. Since these are two diametrically opposing approaches, students and even faculty will need further assistance on how to cite them.

The use of AI-generated content and plagiarism has been a concern for the GU-Q Honor Council and other student development departments. Some students have been utilizing AI technology without proper citation, which may be considered a form of plagiarism by certain faculty members (Cox & Tzoc, 2023). There is interest in updating the plagiarism policies and guidelines to include AI-generated content. This will have an impact on the entry tutorial that all students are required to complete upon admission to GU-Q. The tutorial aims to teach and assess students' ability to avoid plagiarism.

Finally, the faculty is perhaps the most crucial stakeholder group. The discussion about ChatGPT among faculty members has ranged from outright banning it and abandoning research papers as an assessment tool in fear of cheating to how best to incorporate ChatGPT into novel student assignments to prevent cheating. It is worth noting that faculty positions are not universally in favor or against, as it depends on the professor's training and field of study, and comfort level using technology. It will probably take time for instructors to adjust, and the best approach, for now, is to keep the communication channels open and offer suggestions on new types of assessments and digital skills development to help faculty navigate the new order of things. Rudolph (2023) advocates for the creation of assessments that focus on topics that students genuinely care about and the creation of learning experiences that authentically assess student knowledge (p.355). As instructional partners, librarians can assist faculty members with planning and developing creative assignments such as podcasts, videos, posters, and website development. Incorporating digital skills and developing creative assignments are areas where faculty members and librarians can work together to foster authentic learning experiences.

### **Digital Skills**

As previously mentioned, librarians are positioned well to be leaders within higher education with regard to the impact of AI due to their knowledge and skills in information, digital, and AI literacies. How these skills and knowledge are demonstrated practically through our work with faculty and students as well as utilization of the spaces and resources available in libraries such as computing and media production equipment. This is important because in response to the challenges posed by disruptive technologies like ChatGPT, faculty are rethinking how they approach assessment. Writing about the implications of ChatGPT, Cox

and Tzoc have found that faculty will potentially favor more complex assignments connected specifically with the content of the course instead of testing for factual understanding or essay writing (2023). They also have found that there is interest in assignments taking other forms such as infographics, podcasts, or videos (Oyelude, 2023). Since “academic libraries already provide services and spaces for these types of creations and learning opportunities. Librarians can assist faculty in creating such assignments” (Cox and Tzoc, 2023, p. 100).

Librarians can also help advise faculty or craft assignments that directly teach students how to interact with AI tools. For example, ChatGPT can produce a rough draft of text that students can then use as a critical foundation for further research and fact checking (Cox and Tzoc, 2023, p. 101). Librarians can teach students how to produce and evaluate AI-produced content, which again reflects on the intersection of the literacies and the role librarians can play.

Some specific examples of digital skills that are being developed at the Georgetown University of Qatar Library include podcasting, audio, and video production and editing, photography and poster design, data management and visualization, and web-based presentation and e-portfolio creation. The library partners with other personnel and departments within the university, such as the educational technologist and writing center, to develop and deliver digital skill training and instructional support. The library space, however, is a unique location on the campus that can bring together all the skills and tools needed for faculty and students to learn and practice skills at the intersection of the literacies and in support of the evolving educational and employment landscape.

### **Higher Education, AI, and Next Steps**

In the coming weeks, months, and years, higher education practice will likely undergo significant changes with the adoption of AI, particularly ChatGPT. For example, we have noted that some faculty have started removing research papers as a form of assessment because of the fear of students cheating with ChatGPT and reverting to earlier forms of assessment like in-class exam papers. We expect more faculty to choose that route until things clear up more about alternative assessment methods. There is a major drawback though, to this option as students do not develop independent research skills, something that will probably be even more in demand in the future because of issues of verification of sources, as we discussed earlier. Librarians can offer assistance to faculty in implementing alternative forms of assessment, as mentioned in our discussion of digital skill development, that is less susceptible to cheating by students using ChatGPT. This may involve incorporating more interactive learning methods and utilizing technology as suggested by the academic literature.

Moreover, librarians can dedicate more effort and focus on nurturing critical thinking abilities by incorporating information, digital, and AI literacies. The critical thinking skills that librarians already impart, such as verifying the authenticity of information sources, assessing and scrutinizing data, and identifying biases and misinformation, will become even more crucial with the amplified utilization of AI tools and technologies.

Librarians should take steps to prepare for the evolving needs of faculty and students with respect to AI technologies as changes are anticipated in the near future. Cox (2021) points out "that new forms of professional practice often arise from the arrival of new technology" and "new practices require professionals to acquire new competencies (p.370). Library

professionals will need to upskill, retool, and stay informed about AI developments. In the blog post, A tech librarian explains how to build AI literacy; librarian Nicole Hennig explains that AI literacy

is an especially important literacy to stay current with. It's also an important literacy for all librarians, because we have the potential to use it in many areas of our work. AI expertise is increasingly being listed as a job requirement in many fields. I agree with those who say, "AI will not replace you. A person using AI will." (Pfeiffer, para 5)

To achieve this, library practitioners should learn new skills like prompt engineering and how to use new AI tools. This will help them better inform and support AI literacy. Librarians should also anticipate the use of AI tools by students in their assignments and the need for faculty to create new methods of assessing student learning, such as producing podcasts, videos, research posters, portfolios, etc. Furthermore, librarians must remain informed about the latest developments in artificial intelligence. They can do so by seeking advice from educational technologists, attending training sessions, communicating with colleagues doing similar work, and other individuals or groups with a shared interest in this area of innovation.

## **Conclusion**

The field of Artificial Intelligence will continue to evolve as technological advancements continue to improve, which will probably exacerbate the need for AI literacy. Librarians, in their role as stewards of information and technology, are uniquely positioned to stay abreast of new developments and facilitating AI literacy in higher education. We know that there are important connections and intersections between information, digital, and AI literacies, especially in the areas of discovery, evaluation, and creating new knowledge. Using AI tools and various database platforms effectively while remaining critical thinkers and information evaluators is where librarians' skills come into play. By bridging literacies and learning, librarians can help shape the future of AI-assisted learning through these intersections.



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