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Information literacy after the AI revolution

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Abstract

This article asks what role does information literacy (IL) play in information environments where information tasks are increasingly being conducted in cooperation with, or delegated to, artificial intelligence (AI) systems. The article discusses recent AI developments and their potential consequences from the perspective of information practices, emphasising the ways increased autonomy and adaptiveness of information systems challenge human agency. The article concludes with a call for future research and action, highlighting the unique position of IL researchers and practitioners in shaping the future with AI.

1. Introduction

Enabled by the development and increased use of artificial intelligence (AI) systems that collect, process, and react to data in ways that 'simulate human intelligence' (see Elliot, 2019), information systems have become increasingly automated, adaptive, personalised, and easy to use. Many of our routine information-related tasks can now be delegated to AI-powered search engines, (social) media platforms, streaming services, and digital assistants that seek to enable a frictionless experience for us by anticipating our needs, wants, and desires. At the same time, new opportunities for information seeking and creation have emerged due to generative AI applications that not only allow for information searching in human-like interaction, but also enable the quick generation of content for different needs and requirements (see Hirvonen et al. early view). These developments are quickly shaping the ways we acquire, evaluate, share, create, and use information in everyday life, in education, and as part of work tasks, and while doing so, challenge our understandings of information literacy (IL).

The impacts of the development and increased uptake of AI technologies are difficult to foresee, especially since this *AI revolution* (for example Davenport, 2018) is not only to do with the development of specific AI technologies, but also with how the use of these technologies has quickly exploded in different sectors of society. This includes the ways AI systems are being used to mediate information and interactions between people and to modify, augment, and generate content to accomplish such goals (Hancock et al., 2020), shaping or even revolutionising organisations and communication (see Davenport, 2018; Ågerfalk, 2020; Ågerfalk et al., 2022; Sheikh et al., 2023b). Now, AI systems can be considered as general-purpose technologies that, when integrated into wider systems of technologies, have systemic effects on society (Sheikh et al. 2023a). What prior general-purpose technologies such as the steam engine and electricity have taught us, is that both the benefits and the risks and harms associated with them are systemic, wide-ranging, and difficult to predict (see Sheikh et al., 2023b).

What is evident is that in information environments increasingly occupied by intelligent systems, new capabilities, dispositions, habits, and resources are needed for people to be able to learn and work with information, to become and keep informed, to engage with society, and to protect their own agency. In the following sections, I will discuss how the increased adoption of AI systems are gradually shaping our information practices, concentrating on the increased autonomy and adaptiveness of information systems and concerns for human agency. This short article concludes with a call for future IL research and action.

2. AI shaping information practices

The OECD (2023) defines an AI system in the following way:

> An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment.

Instead of defining AI systems as machines mimicking the intelligence of humans (see Elliot, 2019) or based on the specific techniques they deploy, this definition underlines the uses of such systems; with different levels of autonomy and adaptiveness, AI systems are used to generate predictions, content, recommendations, or decisions. This definition is helpful in understanding how AI systems are being integrated into and shape our information systems and, consequently, our information practices.

Examples of AI in information systems that permeate our everyday lives include search engines with multimodal and conversational search features, auto-fill queries, and personalised search results, recommendations and automatically curated contents in streaming and video-sharing services and social media platforms, and chatbots and digital assistants integrated into various services and platforms (see Elliot, 2019; Haider & Sundin, 2019; Hirvonen et al. early view). More recently, Generative AI, referring to deep-learning models that enable the automatic creation of content such as text, image, video, audio, and computer code (Martineau, 2023), has gained attention especially with the launches of the large language model-based chatbot ChatGPT and text-to-image model DALL-E, both by OpenAI.

These tools have begun to shape our information practices by opening new opportunities for information acquisition and creation, contributing to the trend of personalised content becoming the norm in digital platforms (UNESCO IITE and TheNextMind, 2020). Many AI-powered information systems operate in somewhat unnoticeable ways and as such, may appear as effortless, smooth, and frictionless in use. Without much thinking, we may follow Google maps' directions in selecting the route we take, listen to the music that is suggested to us in Spotify (see Anderson et al. 2020), engage in watching an endless stream of content that is displayed to us on TikTok (Bhandari & Bimo, 2020), or take Google BARD's "fresh, high quality responses" (Pichai, 2023) as reflective of reliable information (see also Dwivedi et al., 2023; Jylhä, et al., 2024). Consequently, we have increasingly begun to cooperate with these intelligent systems by delegating our active information searching efforts to them (Willson, 2017; Jylhä et al. 2024) and the same applies to relevance and quality evaluation (see Hirvonen et al. early view). This may be helpful in many situations and add accessibility to information as we are able to receive information better matched to our needs and wants with little active effort on our part. We ought to ask, however, who then makes these decisions and evaluations for us if we are not the ones making them - and on what grounds?

3. Adaptiveness, autonomy, and human agency

While AI development has been groundbreaking in advancing scientific development, offered new opportunities for learning, helped speed up routine work tasks, opened new avenues for creativity, and contributed to increased access to information (Dwivedi et al., 2023), a range of economic, social, and environmental risks and harms have been associated with their development and use (Larsson et al. 2019, van Wynsberghe, 2021, Crawford, 2021).

A central overarching concern with AI systems concerns human agency, that is, the human capacity to act. As noted by the European multistakeholder forum AI4People (2020) and UNESCO (2021) reports, increased autonomy of the systems foregrounds the need to pay more attention to the agency of humans when interacting with AI systems. UNESCO (2021) highlights the "growing risks of reducing individual agency, people's ability to interpret reality autonomously and to act according to their own agenda". AI4People (2020) report raises similar concerns and argues that without an understanding of AI systems, people will not be able to embrace and protect their own agency in the emerging technology-mediated environments.

An important challenge in this regard is that our information environments are increasingly dominated by digital platforms that are driven by commercial objectives (Milano et al., 2020), and, intentionally or not, asymmetrically favour certain political, ideological, and profit-oriented agendas (Jungherr, 2023). These platforms curate and personalise content ushering us to accessing certain pieces of information while hiding others, generate content often perpetuating existing biases and stereotypes (for example Jungherr, 2023), and can be designed to "trap" us into consuming content as long as possible, since that is what serves their business model (Seaver, 2019). By adapting our actions both at individual and collective levels, and by prioritising and privileging certain types of information, they may homogenise exposure to information (Nechushtai et al., 2023), reduce diversity in content consumption (Anderson et al., 2020), and narrow our information landscapes (see Lloyd, 2019). In fact, it is argued that AI systems do not only match information to our needs and wants, but also shape our preferences

and choices (Milano et al., 2020), homogenising our taste on the one hand (see Hesmondhalgh et al., 2023) and polarising our views on the other (Cho et al. 2020).

These challenges highlight the central systemic problem with AI: the problem of power. Liu (2018) argues that the power exercised through AI systems can be organised into three levels: first, the power that is exercised over people in mundane activities where everyday decision-making is displaced; second, the power impacting societal development and consequently, human rights, values, and aspirations; and third, the power concerning existential threats to humanity. While much of the public discourse has concentrated on the third level, the first two are likely the ones that require our attention most, also when it comes to IL.

4. Conclusion: Fostering IL beyond the AI revolution

What has been said in the previous sections highlights the meaningfulness of IL in the emerging information environments, where information tasks are increasingly being delegated to AI systems and brings us to the question the next decades of IL research and practice will need to resolve: how can we foster IL amid and beyond the AI revolution?

Increasing public understanding of AI is framed as a key remedy for some of the potential harms of AI (Council of Europe, 2019, AI4People, 2020) and as an important part of future media and IL efforts (UNESCO, 2021). This includes raising awareness of the operations of AI technologies, the potential personal and societal implications of their development and use, as well as new skills such as prompt engineering (see Lo 2023) that are needed to make use of AI systems in effective ways. Importantly, if we are to build a critical, reflexive, and responsible approach to the use of AI systems as part of our information activities (see also Lloyd, 2019, Haider & Sundin, 2019), it is necessary to note that it is not only understanding that is needed, but also the capacity to take action to make use of technologies in fair ways and work against the potential negative implications that are associated with their use (see Hirvonen et al. early view).

In this regard, our capacity to influence what information we acquire is a central issue and increasingly tightly coupled with our capacity to influence what information is acquired of us (see Pop Stefanija & Pierson, 2023). New strategies may be needed to be able to maintain these capacities and to work against such uses of AI systems that are not aligned with our own purposes or values. These may include defensive practices such as deliberately displaying multiple "selves" in digital platforms to avoid unwanted personalisation of content (Head et al. 2020) and claiming authority over the ways we are being categorised based on the information collected of us (Pop Stefanija & Pierson, 2023), for instance.

At present, we are still developing our understanding of how the AI revolution will impact our information practices in the longer term, but how we can both protect and ethically exercise our own agency with autonomous and adaptive systems seems to be among the pressing issues. How agency is exercised is already central to IL research (Hicks et al., 2023, xviii), but how we address it requires continued attention in both future research and in practice. Sociocultural and sociomaterial theorising of IL where agency is viewed as "dispersed over people and material objects" (Hicks et al., 2023, xviii) may be particularly helpful here and aligns with how the

agency of humans is being addressed in current discussions on AI. This theorising helps explain how it is not only an individuals' knowledge and skills that matter, but also the setting, the tools, and the people participating in the practice. This view on agency may also advance our understanding of IL in practical pedagogical work by directing our attention to the multitude of ways we can support people in acting with information in ways that help protect their agency and align with their values.

While there is a tradition of AI research in library and information science, so far not much attention has been given to the ways AI systems are contributing to the shaping of information practices (Haider & Sundin, 2019) and, consequently, influencing and restructuring our thinking and actions, social relations, identities, and societies. There is a pressing need for this understanding along with knowledge on how we can foster IL in the midst and beyond the AI revolution. IL researchers and practitioners are uniquely positioned to approach AI systems as part of our information activities, practices, and environments, and in developing an understanding of the ways we can ethically engage with these systems as part of our everyday lives, learning, and work. In the next decades of IL research and practice, I expect collective efforts in extending our awareness of building capacities that enable the development of sustainable, ethical information practices in the emerging socio-technical information environment, recognising an individuals' agency in their information environments and in making change – and as such, shaping the future with AI systems.

Declarations

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AI-generated content

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