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Putting Algorithmic Literacy into Conversation with the ACRL Framework

Insights, Ideas, and Innovations

It is increasingly difficult, if not impossible, to unpack and examine our information environments without considering the role that algorithms play. Algorithms are a set of instructions to accomplish a task.¹ But algorithms are not neutral. Rather they are influenced by the humans who design them and the data used to train them.² And these algorithms, which are shaped by human biases and decisions, are central to the way that our information environments function, from social media sites to search engines to generative artificial intelligence (GenAI) chatbots. For good or ill, algorithms increasingly shape and mediate our experiences with information. What we see, discover, share, communicate, and even what we ask can all be influenced by omnipresent algorithms. As a result of the prevalence of algorithms and the power they hold, we are seeing the development of algorithmic literacy frameworks that seek to empower people to be more aware of algorithms, which can fade into the background of our online experiences, and to critically engage with algorithms.

Algorithmic literacy is developing alongside emerging conceptions of AI literacy and evolving conceptions of information literacy. With a focus on the ways that algorithms influence our experiences with information, algorithmic literacy provides a lens for thinking critically about the systems, structures, and power dynamics that shape our information environment. Algorithmic literacy's focus on systems thinking, individual agency, and empowerment echoes many of the strengths and approaches found within the ACRL Framework for Information Literacy. I believe that by putting algorithmic literacy into conversation with the ACRL Framework for Information Literacy in Higher Education, we can explore ways to equip learners to think critically about the technologies we use for search, discovery, and communication. As librarians, we can use reflective practices, participatory learning, and pedagogical approaches that center the experiences of learners as consumers and producers of information in increasingly complex online spaces. In our current information landscape, to be information literate means to be algorithmic literate.

Understanding Algorithmic Literacy

Algorithmic literacy frameworks and definitions tend to mirror the categories and skill areas of related literacies like information, media, and AI literacy. Leyla Dogruel, Philipp Masur, and Sven Joeckel define algorithmic literacy as “being aware of the use of algorithms in online applications, platforms, and services, knowing how algorithms work, being able

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to critically evaluate algorithmic decision-making as well as having the skills to cope with or even influence algorithmic operations.”³ Meanwhile, Susan G. Archambault focuses on three key elements essential for improving a learner’s algorithmic literacy: understanding how algorithms curate information, understanding privacy risks, and understanding algorithmic bias.⁴ Michael Ridley and Danica Pawlick-Potts propose a more critical algorithmic literacy that considers how algorithms are cultural “sociotechnical systems” and how algorithmic literacy must “encompass multiple perspectives and contexts.”⁵ This emphasis on critical engagement, contextualizing algorithms, and taking action to exert influence or control over algorithmically driven information systems also puts algorithmic literacy into conversation with approaches to critical information literacy.

Within algorithmic literacy there is a particular focus on the need for a deeper awareness of algorithms, including how algorithms work and the context in which we experience them. This speaks to the opaque and black-box nature of many of our modern information environments and the way that algorithms can fade into the background, often by design. The unobtrusive nature of algorithms can be seen as ideal from a design or user experience perspective, but this tendency toward a smooth and seamless user experience can make critical engagement difficult.⁶ How can you question what is outside of your awareness? In a way, algorithms themselves pose a hurdle for the development of a deeper literacy because they are so often experienced without being acknowledged, much less understood.⁷ As such, many conceptions of algorithmic literacy emphasize the need for awareness and understanding of algorithms as a prerequisite for deeper critical thinking, evaluation, informed decision-making, and even activism.⁸

Control, Fatigue, and Taking Back Power

Much of the discourse surrounding algorithmic literacy focuses on issues of control, including the control and influence that algorithms can exercise on individuals, and on issues of empowerment, where individuals can develop skills to better navigate algorithmic environments. As Ridley and Pawlick-Potts note in their work, algorithmic literacy provides concepts that we need to examine how algorithms exert control over people and to consider how we can empower people to take control back and better manage algorithmic systems and environments.⁹ This discourse also speaks to the ideas of individual agency and individual empowerment that are threaded throughout the ACRL Framework for Information Literacy. Like the Framework, algorithmic literacy emphasizes the importance of equipping people to take action in information environments, which are increasingly shaped by algorithms.

While both the ACRL Framework and algorithmic literacy emphasize the value and importance of individual empowerment, additional emerging concepts around algorithmic power and algorithmic cynicism also highlight the challenging emotional and psychological experiences that people can have with algorithms and how this can affect their ability to critically engage with them and their information environments writ large. These concepts of algorithmic power and cynicism, and emerging algorithmic literacy frameworks, help articulate the growing importance critical reflection and of unpacking our complex and often emotional experiences with algorithms.

Algorithmic power describes the power and often outsized influence that algorithms hold over our society and culture, including reshaping how our social, economic, and cultural

systems work.¹⁰ Algorithms greatly influence how we engage with information and, as a result, influence everything from political discourse to cultural trends to how we behave, communicate, make decisions, make purchases, or just engage with the world. And the algorithms themselves, often operating without transparency or accountability, are of course developed by and controlled by individuals and corporate entities that have amassed an astonishing amount of wealth and influence.¹¹ Algorithmic cynicism, meanwhile, describes the feelings and reactions people are having in these algorithmically controlled information environments, where algorithms hold a great deal of sway and influence.¹² These feelings of fatigue, burnout, or cynicism can result from feeling disillusioned about how algorithms work and how much power they exert. What is the point of trying to understand or control these systems that appear opaque or uncontrollable? It can be challenging for individuals to take action in our modern information environments. But recognizing and unpacking these emotional and psychological experiences with algorithms can empower people to better understand and engage with our algorithmically controlled information environments, goals expressed by both the Framework and algorithmic literacy.

I am interested in the way that many conceptions of algorithmic literacy emphasize the importance of empowerment and even potentially influencing algorithmic systems. In light of research on phenomena like algorithmic cynicism or fatigue, or studies showing how wary people are about emerging technologies like GenAI,¹³ this focus on empowerment, engagement, and action seems increasingly significant. Algorithmic literacy, with its emphasis on awareness, understanding, and critical engagement, focuses on equipping people to not only navigate our information environments through skills such as evaluation but also to make choices, identify issues, and potentially take action to change or improve algorithmically driven information environments.

In many respects, algorithmic literacy helps center our focus on the power dynamics inherent within our information environments and gives us language and approaches to address those dynamics via a focus on individual empowerment and decision-making and critical reflection and engagement. Amidst information environments that can feel overwhelming or draining, and the rise in GenAI technologies that are challenging human creativity, interaction, and knowledge construction, I feel that the Framework and emerging understandings of algorithmic literacy both provide a welcome focus on the importance of individual agency. More broadly, if we see information literacy and the skills and dispositions within the framework as vital to civic life and our ability to be informed and to communicate, then it seems that algorithmic literacy is an increasingly key skill set for informed, engaged, and active citizens.

Connecting the Framework to Algorithmic Literacy

The ACRL Framework for Information Literacy includes grounding theories and approaches that lend themselves to examining and critically engaging with the algorithms that are an intrinsic part of our information environments. In many respects, the language, concepts, and ideas found within algorithmic literacy draw upon the ideas in the Framework and broader conceptualizations of information literacy.¹⁴ For example, algorithmic literacy encourages people to develop an awareness of algorithms, which speaks to ideas of metacognition and metaliteracy. Metaliteracy and metacognition are found throughout the Framework, and these concepts emphasize the need for individuals to develop an awareness

of their own thoughts, actions, and learning, resulting in individuals who can engage in critical self-reflection.¹⁵ This idea of awareness—whether of how algorithms work, of our reactions to algorithmically driven content, or of the roles we play in our information environments—is central to both algorithmic literacy and to the Framework.

Additionally, researchers have identified major psychological and behavioral components that define our experiences with algorithms and algorithmic literacy, including curiosity, motivation, control, and practice, which all equip and empower users to better understand and engage with algorithms as information consumers and producers.¹⁶ These dimensions resonate with the dispositions found within the Framework, speaking to shared values and goals within both emerging definitions of algorithmic literacy and information literacy.

For each Frame, we can pose questions about and consider the role algorithms play in shaping different aspects of information literacy and our information environments.

- Authority Is Constructed and Contextual – How do algorithms construct our experiences with information and shape our understanding of authority?
- Information Creation as a Process – How do algorithms shape the ways we construct meaning and communicate ideas?
- Information Has Value – How do algorithms shape our understanding of what is valuable or worth attention online?
- Research as Inquiry – How do algorithms influence the questions we ask?
- Scholarship as Conversation – How do algorithms influence our online conversations and shape the way scholarship is discovered and shared?
- Searching as Strategic Exploration – How do algorithms help or hinder our ability to find information?

Algorithms arguably play a role in every area of the Framework, from our ability to find, evaluate, and share information with others. A focus on algorithms can enhance and deepen various aspects of the Framework and ensure it remains responsive to and rooted in our evolving information environments. And as we see a rise in AI literacy, algorithmic literacy can provide a bridge to connecting new conceptions of AI literacy with existing understandings of information literacy.¹⁷ Algorithmic literacy frameworks provide a way to explore the implications of algorithms on our information environments and on our relationship to information. But just as importantly, algorithmic literacy asks us to consider how we discover, evaluate, and communicate in environments dominated by algorithms.

Systems Thinking, Reflection, and Student-Centered Pedagogies

Alongside a focus on individual agency and empowerment, algorithmic literacy also centers a combined focus on the broader systems and structures that shape our information environments with the deeply personal and individual experiences we all have with algorithms. In a teaching guide on GenAI from Purdue University, algorithmic literacy is described as “an evolutionary step in our approach to information literacy and learning. It shifts attention to understanding and evaluating the algorithmic systems themselves that now determine which information we see, as well as how those systems impact human actions.”¹⁸ Interrogating both the structural and individual aspects of algorithms is a facet of algorithmic literacy that I feel opens the door for pedagogies that center critical engagement, reflection, and empowerment.

This focus on systems (and the impact these systems have on individuals) is something DeVito explores by describing algorithmic literacy as “the capacity and opportunity to be aware of both the presence and impact of algorithmically-driven systems on self- or collaboratively-identified goals.”¹⁹ This focus on a systems-level awareness as a component of algorithmic literacy also appears in research from Annemaree Lloyd, who notes that though “algorithms are generally viewed in terms of their capacity to address and order information systems,” they have the potential to disrupt how we access, understand, and experience information.²⁰ The attention paid to systems and structures, and the power dynamics that result from those systems, is a unique aspect of algorithmic literacy as well as a focal point that can be put into conversation with individual experiences with and reactions to algorithms.²¹ Overall, this focus on both systems-level understanding and individual human experiences can open the door for pedagogical approaches that align with the goals we see in the Framework, which places a focus on our broader information ecosystem and how individuals can actively engage in that ecosystem.²²

- Reflective practices – A focus on algorithmic literacy can create opportunities for activities where learners compare their experiences with different information-seeking tools and reflect on the role algorithms play in those experiences. You can see this concept emerge in the Research as Inquiry frame, particularly the dispositions around maintaining both an open mind and a critical stance, seeking multiple perspectives, and considering information seeking as open ended.²³
- Evaluating systems and tools, not just output – Algorithmic literacy can deepen lessons on skills like source evaluation by inviting an evaluation of the tools and systems we use to find information. Purdue’s teaching guide on GenAI suggests activities where learners ask critical questions of the tool they are using, such as an AI chatbot or a search engine, to consider biases, how the tool works, whether the tool is appropriate for their information needs, etc.²⁴ You can see this concept at play in the Authority Is Constructed and Contextual frame within the dispositions around asking questions, adopting a skeptical stance, and being willing to question authority.²⁵
- Lived experiences with algorithms – The prevalence of algorithms in our daily lives can provide opportunities for activities where learners explore and reflect on their daily experiences with algorithms and to connect those experiences to their experiences with scholarly research. For instance, Samokishyn outlines activities where learners explore targeted ads and their experiences with shopping sites like Amazon to illustrate the effects of algorithms and explore issues with privacy and bias.²⁶ This concept emerges in the Scholarship as Conversation frame, including the dispositions around recognizing the role individuals play in these conversations as both contributors and consumers, as well as the Authority Is Constructed and Contextual frame, where individuals are encouraged to reflect on their own biases.²⁷

Algorithmic literacy frameworks, which focus on skills like awareness, understanding, evaluation, reflection, and individual action, can be used to complement or deepen information literacy lessons on topics like source evaluation, searching, and the value of information and introduce critical perspectives and a focus on power dynamics into information literacy lessons.

Conclusion: Algorithmically Centered Information Literacy

Information literacy must evolve with our information environments. Our modern information environments are heavily influenced by algorithms, and we are increasingly seeing the effects of GenAI, another technology shaped by algorithms, on our information environments. As we seek to understand this new AI landscape and to bring AI literacy into conversation with information literacy, I think we can use algorithmic literacy to uncover and explore connections among various literacies, to evolve our understanding of information literacy, and to take a broader view of our increasingly complex information environments. Algorithms can serve as a linchpin to help us critically examine and engage with our information environment, from AI chatbots to social media to search engines to databases. Ultimately, algorithmic literacy can serve as a component of a broader information literacy to allow for a deeper exploration of what shapes our information environments, how we engage in those environments as information consumers and producers, and what it means to be information literate. *~*

Notes

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