Information literacy and its interplay with AI

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Abstract. Information literacy (IL) [1] – and similarly digital literacy [2, 3] – want to convey skills to handle information and data, its use and the creation of new information and services. It emphasizes to teach competencies that enable learners to adapt to new environments and thus foster life-long learning. Artificial intelligence systems (AI) enter all kinds of areas, specifically the educational sector on all levels. For example, learning analytics and learning supportive services are established. Learners might see the opportunities of those services that promise to foster individual learning and skill development. At the same time, they need to develop novel kinds of literacy to understand and to apply AI. Thus, IL teaching and literacy frameworks need to consider an adaptation to recent changes that come with AI.

Our contribution wants to start a discussion within the IL expert field on how IL teaching needs to prepare learners for the new era of AI. We will discuss if IL teaching frameworks need to be adapted to foster AI literacy and moreover, how IL teaching concept can benefit from developments in AI. Based on a scoping review in AI in education, we will introduce current ideas of AI technology and applications and discuss them in relation to IL teaching schemes [2]. Following up the dialog of our IL working group [4], we want to contribute to current discussions on AI in education and the potential influence it might have on IL teaching, and reversely.

Keywords: information literacy teaching, information literacy framework, artificial intelligence, digital literacy, discussion paper

1   The interdependencies of IL and AI

Information literacy (IL) frameworks like the one from the Association of College & Research Libraries (ACRL) [1] have recently been updated to consider new aspects of relevant competencies that a literate person needs for addressing changes and developments in society and technology. Similarly, competencies for digital literate citizens are defined [2, 3] that stress the challenges of digital technologies and their enormous influence they will have for people and their lives. Artificial intelligence systems (AI) are one major achievement that will disrupt traditional ways of facing technologies and digital services in many fields. In this discussion, we want to focus

on changing ways of IL learning and teaching. Our question is: Does we need to adapt IL teaching to prepare for upcoming changes AI will bring in education? We argue to discuss two major aspects: First, the integration of AI might offer opportunities to foster learners' information literacy [4] and thus might be able to improve IL teaching as well. Second, AI requires new competencies for educators and learners that will need to handle, apply, and develop such tools. As such, IL teaching needs to convey those competencies to support the application of AI and life-long learning.

AI to support IL learning and teaching. AI has the opportunity to unleash the "black-box of learning" and help us to understand the learners' experience and how learning happens [5]. For example, AI systems might show ways to educators to apply effective teaching that allows learners to gain relevant skills like problem-solving or critical thinking. One example is intelligent agents, either robots or virtual assistants, which guide learners through their learning experience. IL teaching concepts applying those tools would be able to give timely feedback to educators and learners. AI could guide learners through information seeking processes and make them aware of obstacles and pitfalls. Such tools would need to have reliable indicators for learners' skill progress as well as effective teaching approaches [5]. Thus, IL needs to agree on concepts of information literacy evaluation [6, 7] to be able to automatically measure literacy with the help of AI. A challenge here might be the interdisciplinarity of the field, i.e. researchers and educators teaching IL have diverse backgrounds and goals, and one AI solution might not fit in all IL teaching scenarios. AI might as well be helpful in making learners' information behavior visible and counteract incorrect behavior immediately. A first step to integrate such tools would be to analyze learners' behavior and to use its results to expand IL concepts [8]. Recent examples are context-based information behavior approaches like in health literacy research [10]. In the context of learning and teaching, learning analytics are an option to study learners' behavior and skills [13].

IL to support AI. If AI shall support IL educators in offering individual and personalized teaching learning and teaching, educators need to have the competencies to apply and evaluate such systems. That is, a system's intelligence needs to be visible and transparent, and enable users to recognize its scope and goals [9]. This presumes that users are willing to critically engage with the system rather than just to consume information. Thus, IL needs to consider emerging technology literacy [11] with a focus on data and information creation processes with AI. Besides information literacy, AI requires user empowerment and the ability of self-management as well. AI systems will make finding relevant personalized information easier. They will be able to use huge amount of data to support users in their decision making processes, much faster than users themselves can do. As such, they are tempting users to just use information without considering the steps an information literate person should go through to interpret information judiciously [12]. Badke emphasizes that "[one day] [y]ou don't need training because the search tools do everything for you" [14]. IL teaching needs to consider this human information behavior in its contexts to make learners aware of their own information empowerment. At the end, IL frameworks and teaching con-

cepts need to set the baseline to teach competencies that make learners aware of AI tools and their intentions and improve their skills to responsibly apply AI.

References

1. ACLR: Framework for information literacy for higher education (2016)
2. Vuorikari, R., Punie, Y., Carretero, S., van den Brande, L.: DigComp 2.0. The digital competence framework for citizens. Publications Office, Luxembourg (2016)
3. UNESCO: Digital literacy in education (2011)
4. Condra, M.: How Artificial Intelligence Can Expand Digital Literacy Skills, https://www.human-i-t.org/blogs/how-ai-can-expand-digital-literacy-skills
5. Luckin, R., Holmes, W., Griffiths, M. and Forcier, L.: Intelligence Unleashed: An argument for AI in Education, https://www.pearson.com/content/dam/one-dot-com/one-dot-com/global/Files/about-pearson/innovation/Intelligence-Unleashed-Publication.pdf
6. Dawes, L.M.: Mixing it up: Teaching information literacy concepts through different 'ways of learning'. Faculty Publications, UNL Libraries (2016)
7. Oakleaf, M.: A Roadmap for Assessing Student Learning Using the New Framework for Information Literacy for Higher Education. The Journal of Academic Librarianship 40, 510–514 (2014)
8. Weisel, L.: Ten Years after – Stand und Perspektiven der DGI-Initiative für Informationskompetenz. Information - Wissenschaft & Praxis 69, 121–128 (2018)
9. Schulz, P.J., Nakamoto, K.: Patient behavior and the benefits of artificial intelligence. The perils of "dangerous" literacy and illusory patient empowerment. Patient education and counseling 92, 223–228 (2013)
10. Wedderhoff, O., Chasiotis, A., Rosman, T., Mayer, A.-K.: Unveiling the Subjective Perception of Health Information Sources. A Three-Dimensional Source Taxonomy Based on Similarity Judgements. Front. Commun. 3, 1060 (2018)
11. Shapiro, J.J., Hughes, S.K.: Information literacy as a liberal art. Educom Review (1996)
12. CILIP Information Literacy Group: Definition of Information Literacy, https://infolit.org.uk/ILdefinitionCILIP2018.pdf
13. Ahn, J.: What can we learn from Facebook activity? In: Suthers, D. (ed.) Proceedings of the Third International Conference on Learning Analytics and Knowledge, p. 135. ACM, New York, NY (2013)
14. Badke, W.: The effect of artificial intelligence on the future of information literacy. Online Searcher (2015)