Hack Beyond the Code: Building a Toolbox of Human-Centred Strategies for AI Literacy

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Abstract. Artificial Intelligence (AI) Literacy is quickly becoming an essential 21st-century skill. Be it discerning AI art and pictures from human-made ones, challenging answers from chatbots, or addressing ethical consequences of AI – with AI being ever more present in daily life, it is crucial for everyone to be aware of its utility but also potential pitfalls and challenges. This workshop aims to facilitate a hackathon in which AIED conference participants and local stakeholders will come together, exchange ideas and experiences, and collaborate with the aim of building a toolbox to promote AI Literacy. Our goal for this toolbox is to contain a spread of tools – in the form of lesson plans, apps, activities, and others – to support educators in teaching AI Literacy and students in learning or practicing AI Literacy.

Keywords: Artificial Intelligence · AI Literacy · toolkit · hackathon.

1 Content and Themes

Hackathons are collaborative events spanning from a couple of hours to multiple days or weeks [6, 13]. Typically, these events have a general theme, which provides an umbrella for participants to define projects they would like to work on [11]. Teams can, for example, be formed based on common interests, capabilities, and preexisting friendships or be determined by event organizers [11]. Related to these themes, organizers also often have specific goals in mind when creating an event, which can vary from ideation, design, and/or prototyping to (software) development [11, 13]. The contexts in which hackathons take place are manifold; among others, hackathons are used in educational contexts in classrooms [7, 14], as informal [1], as company events [2], and as open innovation tool in government [18], among other contexts.

Hackathons have been organized in or around conferences as community events, for example:

- the LAKathon[8] in LAK
- HPC in the City[9] connected to the Supercomputing Conference
- HackHPC@ADMI23[10] in connection with the ADMI conference aimed towards minorities in the computing field
- FacultyHack@Gateways23[11] at the Gateways conference which aims to bring together scientists from various disciplines with computer scientists [12]

Likewise, there are university hackathons bringing together students of different programs, such as at the University of British Columbia[12]. Indeed, learning is often cited as the motivation for participating or the reason for organizing hackathons [15].

This workshop will be organized as a one-day hackathon event with the theme of **promoting AI Literacy**. To that end, participants will work in groups to contribute to a toolbox for training AI Literacy.

AI literacy is defined by Long and Magerko 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*" [10]. The key word here is "*critical*". While the AI and machine learning community work hard to improve the technology, – for example, by preventing hallucination, avoiding bias, strengthening the guardrails – we experience increasing criticism from the public, especially parents, now warning against the adverse effects of too early introduction of AI tools in schools. With the rise of publicly available AI tools and chatbots, AI Literacy is becoming an invaluable skill [3]. Those who have not yet acquired that skill, may fall under the illusion that AI tools are infallible. Holmes et al. [9] pointed towards the urgent need for training and promoting AI Literacy for everyone to prepare to live with AI as a measure of safeguarding human values and fundamental ethical principles. At the same time, research shows that students currently use tools like ChatGPT as an "upgraded search engine" [16]. Additionally, Shoufan [16] explored the impact of students using generative AI (in this case Chat-GPT) to solve tasks and then evaluate the accuracy of the results. One takeaway was the importance of prior knowledge to assess the accuracy of ChatGPT's answers [16]. Singh et al. [17] found that of their 430 students, only 11% view "providing misinformation" as the biggest threat, whereas 6% chose biased responses and a total of 63% see either plagiarism, reduced thinking or over-dependence as the biggest threats [17]. This could stem from confidence in detecting misinformation or a lack of awareness. On the other hand, teachers often have a limited

[8] https://lakathon.org/
[9] https://hackhpc.github.io/hpcinthecity23/
[10] https://hackhpc.github.io/admi23/
[11] https://hackhpc.github.io/facultyhack-gateways23/
[12] https://ctlt.ubc.ca/2019/04/23/students-hack-away-at-educational-data-during-learning-analytics-canvas-api-hackathon/

understanding of AI and how they can use it to support their practice, although they agree that AI can be a powerful resource [4].

But even for more knowledgeable users AI usage can have its pitfalls, thus AI literacy education is also supposed to grapple with "the grown ups'" problem of "falling asleep at the wheel" while using powerful AI [5]: one tends to trust AI too much, become lazy and forget to apply critical judgment.

2 Relevance and Importance to the AIED Community

The AIED 2024 Call for Papers[13] includes a newly-added topic of interest regarding the importance of AI Literacy: "Furthermore, we envision that the triad of AIED, AI Literacy, and Fair, and Ethical AI will play a fundamental role in this world in transition and be the drivers for shaping meaningful changes in pedagogical practice, educational policies, and regulations." Our proposed workshop explicitly addresses this topic of interest and aims to further align with the theme of AIED 2024 "*AI in Education for a World in Transition*," thus contributing to shaping education and its needs for this World in Transition.

We envision that the workshop will provide an arena for members of the AIED community to familiarize themselves with aspects of AI Literacy, brainstorm how to promote AI Literacy to prepare learners to live with AI, and go even further to pinpointing fundamental concepts about AI Literacy and designing prototypes for training AI Literacy as tools for educators and learners. The workshop also aims to involve local stakeholders – local AI researchers and PhD students from local universities, EITA! Recife's open innovation initiative – and, thus, bring them in touch and engage them with the AIED community.

3 Format and Activities

The workshop will take place as an interactive, full-day, in-person event in the form of a hackathon. This means that we will dedicate most of the time to group work (see Table 1 for an overview). The organizers will provide guidance on applying proven creativity techniques that they have mapped [8] and that are appropriate for the dynamic hackathon environment to help the participants to use their time efficiently.

We will start the day with a welcoming session and an impulse talk on the topic of AI Literacy to engage and motivate participants, as well as lay some grounding on what the event will be about. Afterward, we will have a discussion about AI Literacy where we will also go into the ethical connotations of AI usage. This is followed by a short ideation and team formation session, supported by appropriate dynamics format. Teams will then have time to discuss and fine-tune their topic and goals before presenting them to the group. In this process we will also guide them in applying heuristics to quickly generate and choose idea.

[13] https://aied2024.cesar.school/call-for-papers/general-call-for-papers

The teams will spend most of the workshop day working on their projects. We will have one checkpoint after the lunch break where teams will share the teams progress and present their plans for the remainder of the day. This checkpoint will provide an opportunity for organizers and participants to provide feedback to teams. The organizers will be available to support teams during the whole duration of the workshop. The day will conclude with presentations of the produced artifacts by the groups.

We envision these artifacts to include lesson plans, interventions, app prototypes or mock-ups, information materials, or plans for hands-on activities. This list is, of course, non-exhaustive. The **output** of the workshop will be a **toolbox**, in the form of an online repository, accompanied by documentation that can be used as a basis for creating training materials to promote AI Literacy.

The workshop will be communicated and disseminated via a website that we will share with participants and the general public before the AIED conference and will be maintained after the workshop in order to promote output's sustainability.

After the hackathon, we will share the artifacts produced during the hackathon via GitHub[14]. Additionally, we will update the workshop's website with reports regarding the hackathon activity. Finally, we plan to organize a follow-up event for local participants with the support of the Innovation Office of Recife.

Table 1. Proposed agenda for the workshop.

Session	**Agenda**	**Duration**
Morning session	Welcoming, schedule and logistics	15 minutes
	"Impulse" talk	15 minutes
	Scenarios and discussion	45 minutes
	Ideation and team formation	30 minutes
	Team presentations	15 minutes
	Team working time	60 minutes
Afternoon session	Checkpoint	15 minutes
	Team working time	120 minutes
	Team final presentations	30 minutes
Closing session	Reflection and future plans	15 minutes

4 Expected Target Audience and Expected Maximum Number of Participants

We welcome practitioners, researchers and students at all stages and look forward to an active exchange between participants of different backgrounds. The expected target audience is individuals participating in the conference and local participants, especially students. We expect a maximum of 20-30 participants.

[14] https://github.com/

We would potentially request to schedule this workshop (provided that it is accepted) on a day that does not conflict with the AIED Doctoral Consortium.

5 Workshop Chairs

The workshop organizers (chairs) have interdisciplinary expertise: AIED and AI Literacy, hackathons, Computer-Sup-ported Collaborative Learning (CSCL), Computer-Supported Cooperative Work (CSCW), Educational Technology and Learning Sciences. Additionally, the organizers have experience in organizing hackathons. One of the organizers is currently a PhD student. We provide the short biographies as follows:

Cleo Schulten (cleo.schulten@uni-due.de): Cleo is a PhD student at the group for Computational Methods in Modeling and Analysis of Learning Processes (colaps) at the University of Duisburg-Essen. She earned her Master's in Applied Cognitive and Media Sciences with a focus on Computer Science. During and after her master's studies she worked in the EU Horizon funded project CS-Track where she worked on the automated classification of Citizen Science projects based on textual descriptions. Her current research focuses on investigating learning in hackathons with the aim to measure and improve the learning experience in such events.

Li Yuan (l.yuan@bnu.edu.cn): Li is an accomplished learning technology advisor, researcher and innovator with extensive experience on advising and supporting open online learning and technology innovation in education. She is currently professor at BNU Zhuhai, where she has established the Centre for Connective Intelligence in Education.

Kiev Gama (kiev@cin.ufpe.br): Kiev holds a Ph.D. in computer science from the University of Grenoble and is an associate professor the Federal University of Pernambuco, Brazil. He researches in the field of Software Engineering (SE), having work in component- and service-oriented architectures, and applied research in the IoT and Smart cities domains. He is currently investigating human aspects in SE within education, collaboration, and diversity & inclusion. Kiev organizes hackathons since 2013 and is a co-founder of Recife's mayorship hackathon Hacker Cidadão. He has been studying time-bounded collaborative events as a research topic since 2016 (e.g, hackathons, game jams, service design jams) within contexts such as open innovation (for cities and enterprises) and education.

Wayne Holmes (wayne.holmes@ucl.ac.uk): Wayne is an Associate Professor in the UCL Knowledge Lab at University College London. His research takes a critical studies perspective to the teaching and application of Artificial Intelligence in educational contexts (AI&ED), and their ethical, human rights, and social justice implications. Wayne is leading the Council of Europe's project: 'Artificial Intelligence and Education. A critical view through the Lens of Human Rights, Democracy and the Rule of Law'; he is also Consultant for the Technology and AI in Education unit at UNESCO and is a Senior Researcher in

AI&ED for IRCAI (the International Research Centre on Artificial Intelligence under the auspices of UNESCO).

Alexander Nolte (a.u.nolte@tue.nl): Alexander is an Assistant Professor at Eindhoven University of Technology (Netherlands) and an Adjunct Associate Professor at Carnegie Mellon University (Pittsburgh, PA, USA). His research focuses on understanding and developing means to support collaboration in corporate, entrepreneurial, civic, educational, and scientific settings. Alexander has studied, organized and supported hackathons across the globe. He is a co-founder and co-organizer of a long running hackathon series in the high performance computing domain (https://hackhpc.org), one of the initiators of the "Hack the Hackathon" unconference series (http://hackthehackathon.org/), and the main contributor to the widely used hackathon planning kit (https://hackathon-planning-kit.org/). Alexander has lived and worked in the USA (Carnegie Mellon University, University of Pittsburgh), Germany (Ruhr-University Bochum), and Estonia (University of Tartu). He has published more than 100 research papers and articles in top conferences and journals in the fields of human computer interaction, information systems, and software engineering. His research has received multiple awards, including an ACM SIGSOFT Distinguished Paper Award.

Tore Hoel (tore.hoel@gmail.com): Tore's research interests are learning analytics, ethics and data privacy related to educational technologies and AI. Lately has AI literacy been the focus of his work. He has been organising university courses in AI Literacy.

Irene-Angelica Chounta (irene-angelica.chounta@uni-due.de): Irene holds a Professorship on Computational Methods in Modeling and Analysis of Learning Processes in the Department of Human-Centered Computing and Cognitive Science, University of Duisburg-Essen and she is the head of the research group colaps (https://www.uni-due.de/colaps/). Her research focuses on computational learning analytics (LA) for technology-enhanced learning (TEL), artificial intelligence in education (AIED) and educational technologies. Her main research interest is to model learners' behavior in order to provide evidence-based, adaptive and personalized feedback, in a variety of contexts: from intelligent tutoring systems and computer-supported collaborative learning environments to hackathons and makerspaces.

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