Extended Abstract for the
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ON GAME-BASED LEARNING AND CREATIVE THINKING FOR DATA AND AI LITERACY EDUCATION

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There is a growing body of literature arguing that working with data is a key skill (Bhargava et al. 2015; Wolff et al. 2016; van Audenhove et al. 2020; Sampson et al. 2022). And yet, while highly valued as a precursor to evidence-driven insights, data are not only expensive to collect, maintain, and mobilize, there is also an urgent need to address data inequalities and the social implications of data infrastructures—such as data-based decision-making in educational settings (Mandinach & Schildkamp 2021; Verständig 2021; Hartong & Renz 2024).

In the context of AI and data science education, the promotion of digital literacy is pivotal for advancing social good. Therefore, we want to explore strategies and ethical considerations necessary for cultivating a learning environment that empowers students to navigate and influence the digital landscape responsibly in two ways. Emphasizing digital literacy, we advocate for an inclusive and interdisciplinary grounded curriculum that equips learners with the skills to critically analyze and utilize AI technologies. This includes understanding data ethics, algorithmic biases, and the socio-economic impacts of digital innovations (D'Ignazio & Klein 2020). Concurrently, we highlight the critical importance of data privacy education, underscoring the need for robust data protection practices and awareness of privacy rights. By integrating these elements into AI and data science education, we aim to foster a generation of practitioners who are not only technically proficient but also ethically informed and socially conscious (Ahlborn & Verständig 2024). Therefore, we want to present and discuss a media educational approach that supports the broader goal of leveraging technology to address societal challenges and promote a more equitable and secure digital future (Gabel & Schiering 2019). For us, the integration of ethical considerations and a focus on societal well-being in AI and data science education is crucial. By creating an inclusive, ethically conscious, and socially aware curriculum, educators can prepare students to not only excel technically but also to be responsible and conscientious contributors to society. This balanced approach ensures that the development and deployment of AI and data technologies are aligned with broader goals of social good and ethical integrity.

We first propose an approach in which we are incorporating a theoretical framework of creative data literacy into media education (Ahlborn et al. 2021, 2022) to shape educational data literacy. This is grounded in the recognition that human relations and impacts produced and reproduced through data are inherently unequal (D'Ignazio & Klein 2020), highlighting the urgent need to address the structural inequalities embedded within data practices, particularly in educational settings. We aim to discuss teaching methods and media educational materials inspired by feminist theory and creative data literacy (D'Ignazio 2017; Bhargava & D'Ignazio 2018, 2020a, 2020b). By integrating creative methods, this framework seeks to cultivate a more inclusive and equitable data literacy education. Since the relation between knowledge, competencies, and creative thinking is quite complex (Kenett 2024), our work aims to empower a diverse range of learners with the skills to critically engage with data, challenge existing power dynamics, and contribute to the creation of more equitable, meaningful, and representative data landscapes.

In addition to its theoretical and methodological grounding, our submission also introduces a game-based open educational resource (OER) for data literacy education in the form of a card game, which will remain open source and designed to be adapted and expanded upon. The material is being developed as part of the Civic Data Lab (CDL) project (funded by the Federal Ministry for Family Affairs, Senior Citizens, Women and Youth in Germany) which promotes data and AI literacy within

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civic society. The role of civic society in shaping debates around digital standards, rights, ethics, and data equality—as well as human-centric data and AI innovation—is crucial (Beinig et al. 2020; Höher et al. 2024; D'Ignazio 2017). Acting as advocates for the wider public interest and bringing concepts like data feminism, privacy, or sovereignty to the fore often requires not only financial resources but also the development of relevant competencies and the fostering of robust networks (Bhargava et al. 2015; Beinig et al. 2020). Therefore, this practical project embedded within CDL empowers civic society stakeholders with skills, knowledge, resources, consulting, and a supportive community.

The card game as an example of creatively driven pedagogy, introduces core data and AI concepts in an accessible manner and invites players to debate and reshape data narratives. Drawing on creative data literacy practices (Ahlborn 2021; D'Ignazio 2017; Werning 2020), the game links theoretical learning with specific, experiential activities of CDL. Participants can experiment with data projects, different scenarios in a data lifecycle, propose their own interventions and assumptions, and discuss real-world data projects with criticality and imagination. By framing learning as a playful, participatory, and socially conscious endeavor, we situate creativity at the heart of the pedagogical process: it is both a catalyst for engagement and a mechanism for cultivating ethical, inclusive, and visionary data practitioners. By weaving together critique, feminist theory, creativity, and practical tools like autobiographical data stories or the OER card game, the interdisciplinary work contributes to a more nuanced understanding of how data and AI education can be aligned with broader goals of social good, ethical integrity, and inclusive innovation.

Our aim is to offer inspiration on how data can be used for social good and to spark motivation for data initiatives within civic society. By integrating a playful, game-based approach at the intersection of creativity and data skills, the framework and material seeks to sensitize a diverse range of learners to the possibilities of using data for social good. It also aims to empower civic society stakeholders with critical competencies required for meaningful participation in debates around our digital future, ultimately enhancing data equality and democratic engagement in the digital sphere.

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