Towards a Critical Design Agenda in Support of Collective Learning Ecologies

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Abstract: This position paper seeks to chart a critical design agenda in support of collective learning ecologies, evolving assemblages of digital, spatial, social, cultural, and/or knowledge resources that are aimed to foster forms of collective learning and knowledge creation. Starting from an ecological perspective on learning, the paper challenges individualistic notions of learning and instrumental understandings of educational technology and argues that there is a need for educational formats and technologies capable to support learners engaged in epistemic endeavors that reach beyond established institutional boundaries and address them as responsible citizens. It is argued that there is a need (a) to take stock of new and alternative knowledge practices, (b) to reconsider the existing social, legal and technical protocols, standards, and infrastructures, (c) to cultivate social relations beyond institutional boundaries, as well as (d) to work towards a pedagogy of articulation and risk.

Keywords: critical design, learning ecologies, educational technologies, computer-supported collaborative learning, inquiry-based learning, epistemic practices

1   An Ecological Perspective on Learning

Recently there has been an increased interest in what might be called an ecological perspective on learning, e.g. [Ja13]. Broadly speaking an ecological perspective on learning draws attention to the evolving assemblages of digital, spatial, social, cultural, and/or knowledge resources learners are creating and are making use of in their study work. In a narrower sense, an ecological perspective challenges individualistic notions of learning and education but "conceives of learning as an irreducible, mutually constitutive set of relationships between individuals and their social and material environments" [DJ17]. Besides conceptual contributions, aimed to substantiate the notion of learning ecologies theoretically, e.g. [Ke12], the interest in an ecological take on learning is also mirrored in pedagogical and technical efforts aimed to device Personal Learning Environment, e.g. [Wi07], to support processes of community-based learning, e.g. [FGW07], and/or to foster processes of mass collaboration, e.g. [Je17]. In all these cases pedagogical and technological means are supposed to transcend institutional, disciplinary, social, cultural, or technical boundaries and allow for new forms of learning and epistemic engagement. While an ecological perspective on learning has opened up new strands of research and development for educational technologies such as the advancement of Massive Open Online Courses (MOOCs) or the configuration of tailored learning environments, the pedagogical and technical design issues associated with these

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developments are frequently approached from an instrumental perspective only. The availability of new technologies, networked knowledge artifacts, and human resources are primarily seen as means to improve learning outcomes and to ensure that students become proficient knowledge workers skilled for the digital age. However, such an instrumental perspective does neither account for the cultural dimension of education and knowledge work, nor does it advance a critical understanding of the challenges, learners are facing when trying to develop their own learning ecologies. Against this background we argue, that to leverage an ecological perspective on learning and to become serious about learners as agentic actors who pursue their own epistemic projects, we need to take a critical perspective on our design efforts,cf. [RA17]. This holds for the field of educational technology in general as well as the narrower domain of computer-supported collaborative learning. We also have to reconsider our role as educators, technologists, and researchers, in order to advance educational formats and technologies capable to support learners engaged in epistemic endeavors that reach beyond institutional boundaries and address them as responsible citizens. Our intent hence is to broaden the current discourse on educational and technological design. To illustrate the timeliness of such an effort and to outline a critical design agenda, we will draw on two ongoing R&D projects targeted at new collaborative forms of epistemic engagement. While the first project[2] is based on a participatory research agenda aimed to engage citizens of different age groups in an autoethnographic inquiry into their own cultural and aesthetic practices, the second project[3] is aimed to foster crowd-based research activities on sustainability among students in higher education. Despite the different subject domains, educational formats, and target populations, both projects can be understood as attempts to enrich the participants' learning ecologies, by introducing new technical, social, cultural, and epistemic resources that transcend institutional, disciplinary, and physical boundaries.

2   Understanding Digital Technologies – Types of Mediation

To advance an understanding of the complexities entailed in an ecological perspective on learning, the critical design agenda we are proposing builds on the multidimensional model of mediation suggested by [BR00] and its later adaptation to the field of computer-supported collaborative learning by [PEH12]. In a nutshell the model holds that (digital) technologies comprise of a material and/or symbolic artifact, as well as associated socio-cultural schemes on how to understand and make use of these artifacts as part of a situated practice. As a consequence, and in contrast to an instrumental conception of technology, (digital) technologies are not simply means to towards a given end, but inescapably mediate practice along multiple dimensions simultaneously. As suggested by [PEH12], educational technologies can be described and analyzed along at least four dimensions or types of mediation. These types of mediation include (a) epistemic mediation, the situated procedures through which knowledge is created collaboratively, (b) pragmatic mediation,

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[2] Onlinelabor für Digitale Kulturelle Bildung (http://www.digitalekultur.online)
[3] SCoRe – Student Crowd Research (https://scoreforschung.com)

the situated procedures through which the collective efforts are coordinated and regulated, (c) social (or collaborative) mediation, the situated procedures through which social relations and networks are (reproduced), as well as (d) reflective mediation, the situated procedures through which the collective efforts are assessed, evaluated, and advanced. For example, a collaborative word editor not just transforms the way ideas are collaboratively articulated, it also alters the way respective processes are coordinated, how social relations are formed, how measures of accountability and quality are re-produced. Bearing in mind that the 'multimediation' of (educational) practice is intrinsic to any kind of technology, we will use the dimension of mediation suggested by [PEH12] in the following as a framework to organize the critical design agenda we are suggesting.

3 Taking Stock of New and Alternative Knowledge Practices

The first issue relates to the epistemic dimension of the learning process and refers to the rules, conventions, and normative commitments that are constitutive for the contexts we are acting in and designing for. It refers to the "epistemic frames" [Sh06] enacted in a particular setting as well as the „ways of knowing that are taken to be legitimate, consequential, worthy of discussion, and useful for justifying actions by people engaged in accomplishing some concerted task" [Su02]. While institutions in (higher) education are still very much driven by disciplinary bodies of knowledge, as well as specific knowledge practices and methodologies, these might be of little or no relevance if we leave the realm of academic institutions, whether applied or not. In our current projects we are actually facing a multitude of new and alternative knowledge practices, including for example new forms of crowd-based investigation, activist and collective artistic research, as well as new tribes of (auto-)biographic and (auto-)ethnographic inquiry. If our intent is to support learning ecologies that transcend institutional and disciplinary boundaries, we hence have to develop new sensitivities to the polyphony of epistemic practices not only within but also outside of academia and find ways to accommodate for different epistemic forms and games. This not only calls for new educational formats, but also asks us to reconsider the ways in which epistemic practices are implicated in digital and networked technologies. Towards this end, it is crucial (a) to reflect on and articulate not only the explicit, but also the implicit epistemic scaffolds and models that are built into respective technologies, as well as (b) to inquire into the modes of knowledge and articulation that are rendered perceptible or imperceptible by a digital technology.

4 Reconsidering the Protocols, Standards, and Infrastructures we Build upon

The second issue is concerned with the pragmatic mediation of the learning processes, the organization, coordination, and orchestration of the epistemic efforts. It entails the social and technical mechanisms that grant or restrict access to technical, social, cultural, and

epistemic resources, the means by which these resources can be created, mobilized, appropriated, or repurposed, but also the setup and characteristics of the institutional and technical infrastructures that are made use of. While a focus on personal learning ecologies implies a shift from institutionalized to more decentralized modes of organization, coordination, and orchestration, it requires us to reconsider the ways in which students' learning ecologies are implicated in social and technical systems and therefore subject to respective forms governance and politics, cf. [Kn13]. For example, aiming to provide students and citizens with a technological infrastructure that allows them to pursue their own (collective) epistemic interests, brings immediately forward questions of authorship, intellectual property rights, the interoperability with other systems, the sustained availability of the resources and technologies provided, as well as the extent to which the resources can be reused and repurposed, not only legally but also technically. Hence, there is a need to think not only about particular resources and how these can be integrated into a learning ecology, but also the social, legal, and technical protocols, standards, and infrastructures, in which these ecologies take shape, cf. [Ma16]. In particular, it is important (a) to devise social and technical protocols that transcend institutional boundaries as well as the confines of commercial vendors, (b) to envision systems that are capable to adapt to the evolving coordinative needs in open ended collaborative efforts, and (c) to balance individual accountability with new forms of collective authorship.

5   Cultivating Social Relations beyond Institutional Boundaries

The third and closely related issue touches upon the social mediation, the seeding and cultivation of social relations and networks in support of the learner's epistemic efforts. Locating learning not within the boundaries and formats of educational institutions but striving for more inclusive, boundary-crossing, and networked forms of learning does not simply imply access to a broader and more heterogeneous set of (social) resources, but also entails a shift in power-relations. Yet, such a shift is not a unidirectional effort of empowerment, but a highly dynamic and reflexive process. This holds for both, the relations between the learners and the educational institutions, as well as the relations between those engaged in the learning ecologies. For example, asking citizens of different age groups to take part in a research project as knowledgeable experts of the cultural and aesthetic practices they are engaged in challenges established role-models, social expectations, responsibilities, and obligations. Similarly asking students to actively contribute to research on sustainability raises questions on how these efforts will interfere with established or emerging forms of scientific and public deliberation and discourse. Accordingly, there is a need (a) to think of social and technical arrangements that are open to all those who have an interest in what is at stake, but also (b) to devise for new forms of participation and collaborative deliberation on issues that matter to the actors involved.

6   Towards a Pedagogy of Articulation and Risk

The fourth issue, finally, relates to the reflective mediation of epistemic endeavors, the processes through which respective practices are articulated, reflected, and advanced. It refers to the question of the (educational) outcomes that are deemed desirable and worthwhile, and the ways in which respective aims are negotiated and established. While from an institutional perspective the desirability of educational outcomes is usually determined by established curricula and educational policies, these are not necessarily relevant to or might even be in conflict with the aspirations of a learner and the setup of his or her learning ecology. For example, citizens' inquiries into their own cultural and aesthetic practices, or students' research into sustainability issues might less be oriented towards the achievement of preestablished learning goals than driven by their curiosity or ambition to solve a particular problem. If we are serious about learners as deliberate actors and citizens, desired outcomes cannot be pre-defined by educational institutions alone, but that there is a need for mechanisms that allow the participants to articulate and negotiate their (common) concerns and the kind of outcomes they deem worthwhile and desirable. As suggested by [Gr97], such efforts might call for a new model of pedagogy, "a pedagogy of articulation and risk", that refuses "to assume ahead of time that it knows the appropriate knowledge, language or skills, […] a contextual practice that is willing to take the risk of making connections, drawing lines, mapping articulations, between different domains, discourses, and practices, to see what will work, both theoretically and politically". It also challenges instrumental notions of technology as it requires to have a closer look into the processes through which technologies emerge and the politics they entail.

7   Outlook

While our concern for these four issues is clearly grounded in our current project efforts, we believe that they might form a starting point for a critical design agenda in the fields of educational technology as well as CSCL. As far as we can see, related issues have popped up recurrently in various places, but there has been no systematic debate on the wider pedagogical, societal, political, and technical implications of our efforts. Therefore, we understand this contribution as an attempt to broaden the discourse, but also see it as an opportunity to enter into new strands of design, research, and technological development aimed to foster the advancement of more sustainable learning ecologies.

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