

Local-global Maker-places: Toward an Instrument for International Maker Education

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Abstract: After the establishment of a makerspace in any context, sustainability is becoming increasingly important. As an international group of early career scholars with experience in maker education, we engaged in a series of reflective conversations that called us to consider visions for makerspaces as sustainable maker-places. We offer a representation that cuts across visions for sustainable maker-places with the intention to begin to develop an instrument for international maker-education.

Place-based approach toward international-maker education

As ecological challenges continue to affect human life, questions related to preparing people to identify local solutions to global problems gain importance. During the past decade, maker educational approaches have found international resonance with maker environments rapidly spreading across settings (e.g., Blum-Ross et al., 2020). Such environments foster local communities and are situated in national and international socio-historical discourses and materialities. They are local instantiations of international scale. Although maker education is well represented in the learning sciences, international perspectives are underrepresented.

Guided by place-making as a theory of learning that highlights how people co-construct spaces as personally and socially meaningful (Taylor & Phillips, 2017; Marsh, 2020), the authors came together in search of language for developing a framework for supporting a sustainable global future for making that is rooted in local communities and centers the artifact across ecologies (e.g., Peppler et al., 2021). Distinct from spaces, we note that “places bring together people who engage in a common activity, may share a particular history, or identify with a locality in a particular way” (Taylor & Phillips, 2017, p. 594). We argue that makerspaces are made into maker-places by the individuals and communities that co-construct them. At this project proposal stage, to begin work toward a framework for thinking about the place-ness of makerspaces (i.e., the makerspace as a maker-place), as an international group of early career scholars, we engaged in a series of reflective conversations that considered visions for sustainable making and makerspaces within our local contexts, revolving around the question: *Considering your history with maker education, what vision do you have for a sustainable future for making?* The goal of this early ideational work is to suggest the development of instruments for the design of makerspaces as maker-places that account for the local historical, cultural, and social dimensions of maker-places as sites for learning as well as the possibility for making to support innovative responses to global challenges.

Conversations toward a shared vision of international maker-places

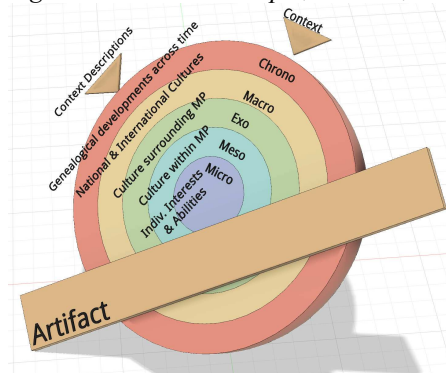
The author team is an international group of early career scholars spanning North America, Western Europe, and Western Asia. We chose to come together as our work deals with making in disparate and related ways in contexts with an array of similarities and differences. As we came together, we took cues from autoethnographic trends that frame critical reflection as a form of methodology (e.g., Morley, 2011). We asked ourselves a series of discussion questions and ultimately crafted a single question for individual reactions. After responding to this prompt individually, we came back together to discuss, react to, and revise visual representations that team members had generated (see Figure 1 for the result of this discussion). Then, we revised our individual responses to capture reactions to the visual representations. The visualization served to support our conversation toward creating a design tool for maker-places that are sensitive to local and global forces.

Toward sustainable futures for maker-places

For making to remain sustainable, maker educators will need to consider multigenerational approaches that support learners in building and sustaining community. Teachers and mentors, family members, and community stakeholders must work together to continue to provide opportunities that are relevant for learners and their families, encourage individual and collective development, and make visible potential future pathways. Next, physical materials play a fundamental role in maker-places, contributing to the co-development of places and people, STEM domain learning, and gender equitable pathways within STEM. Integrating understanding of

ecological, economic, and socio-historical dimensions of maker materials can inform localized material ecologies that break global inequitable material lifecycles toward local sustainability. Additionally, a sustainable future for making requires attending to the interactional dimensions of making spaces into maker-places, including social, historical, and material relations. This future requires attending to the parallel settings and places in which people interact and connect (i.e., online, home, out-of-school settings) so as to forge greater connections across these settings for meaningful learning experiences. Furthermore, maker-places should attract local people and keep them coming back. While designing such maker-places, we should consider three levels of context: micro, meso, and macro (Marsh, 2020). The skills and interests of the target group in the micro context; the culture, beliefs, and interests of the local community in the meso context; and the national and international developments in maker education in the macro context. When considering the various contexts maker-places should engage with, we combine ideas from Marsh (2020) and Pepler et al. (2021) in Figure 1.

Figure 1
Artifact slicing across contexts: People, cultures, and temporalities



Discussion

By coming together from different parts of the world and bringing perspectives on creating sustainable maker-places, the author team provided a representation to support design. The representation highlights the importance of considering both the maker (micro context), their immediate community (meso context), and the space for making (exo context), as well as the global histories (macro context) and current challenges (chrono context) in designing maker-places. The representation, as approximated in Figure 1, serves as a nascent tool to prompt us as authors and conference attendees to ideate ways to encourage makers to deliberately engage with and across the layers of place-making. The visualization is an intermediary step toward the design of a *Maker-Place Design Tool* (MPDT). We intend for the visualization to inform the analysis our collective observations and experiences in maker educational settings toward generating exemplary vignettes that represent each layer of sustainable future maker places. The vignettes are intended to inform the creation of the MPDT. The MPDT will include prompts, statements, and case studies to support maker-place researchers, designers, and educators to engage in discourse across contexts as they produce artifacts toward sustainability. Although early in development, the MPDT promises to provide both practical and theoretical support for maker-place makers to thoughtfully engage with and across layers and to consider their *place* in *making* solutions and designing futures.

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