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Makerspace Collaboration as Dialogue and Resistance

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Makerspace Collaboration as Dialogue and Resistance

In this chapter I claim that librarians need to adopt a purposeful and strategic approach to collaboration in order to create inclusive learning spaces. Makerspaces typically come into existence through collaboration and the space's identity is shaped by the nature of these partnerships and by partners' views on making. While the maker movement typically celebrates making as a means of individual empowerment with the potential to transform contemporary education and address inequality, other observers have criticized the movement for upholding business and military interests and universalizing experiences of middle-class whiteness.¹ Uncritical approaches to making risk deepening sociotechnical divides along lines of race, class and gender. Librarians who want to create spaces that resist forces of social oppression must create space for critical reflection in their collaborative work.

Newell and Bain define collaboration as autonomous, voluntary work undertaken by multiple participants who agree on their goals, the benefits of working together, their understanding of the problem domain, the decision-making systems they will use, and the processes that will structure their interaction.² Collaboration is seen to enable partners to efficiently meet the demands of complex work undertaken amid constrained resources.³ Library professional discourse frequently embraces this view of collaboration founded on values of rationality, choice and agreement and affirms collaboration as intrinsic to successful librarianship.⁴ However, models of collaboration based on agreement and

¹ Evgeny Morozov, "Making It," *The New Yorker*, January 13, 2014, ProQuest; Sharona Ginsberg, "Diversity in Making," *MakerBridge*, August 16, 2016, <http://makerbridge.si.umich.edu/2016/08/from-archives-diversity-making>; Shirin Vossoughi, Paula K. Hooper, and Meg Escudé, "Making Through the Lens of Culture and Power: Toward Transformative Visions for Educational Equity," *Harvard Educational Review* 86, no. 2 (2016), 212-14.

² Catherine Newell and Alan Bain, *Team-Based Collaboration in Higher Education Learning and Teaching: A Review of the Literature* (Singapore: Springer, 2018), 17.

³ Adrianna J. Kezar and Jaime Lester, *Organizing Higher Education for Collaboration: A Guide for Campus Leaders* (San Francisco: Jossey-Bass, 2009), 8-13; Lorraine Walsh and Peter Kahn, *Collaborative Working in Higher Education: The Social Academy* (New York: Routledge, 2010), 4.

⁴ Dick Raspa and Dane Ward, "Listening for Collaboration: Faculty and Librarians Working Together," in *The Collaborative Imperative: Librarians and Faculty Working Together in the Information Universe*, ed. Dick Raspa

efficiency fail to foster meaningful dialogue between divergent perspectives, navigate institutional power divides, and resist forces of oppression. Rather, makerspace collaborators should represent a diverse range of constituencies faithfully in decisions where lower-status stakeholders (such as students) may not be invited to the table. And they need to be able to communicate broadly and inclusively amid environments characterized by information overload, where communications (such as email blasts and project charges) run the risk of narrowing a range of opinions and viewpoints down to a single authoritative narrative.

My recent experience as a systems librarian and interim co-leader of an academic library pursuing a makerspace collaboration with an academic computing unit has compelled me to reflect more deeply on collaboration and question my assumptions. In 2016 my colleagues developed a vision of teaching information and media literacy (IML) lessons through a library makerspace and introduced the concept into university-wide strategic planning documents. Subsequently academic computing moved forward with a project plan for a makerspace hub in the computer center focused exclusively on digital technologies, and when leaders of the two units met to reconcile the diverging plans, we realized we had different visions of making. Librarians spoke of initial user needs assessment, critical evaluation of technology, and analog forms of making such as zines, buttons and sewables, while computing staff spoke of leveraging the Substitution, Augmentation, Modification and Redefinition (SAMR) framework⁵ to convince faculty to adopt digital technologies including augmented/virtual reality (AR/VR), 3D printing, and Arduinos. We eventually agreed we would each pursue our own goals, giving the campus makerspace a decentralized, multi-hub structure. Our library went on to establish a zine collection, teach IML sessions involving zine-making, and deploy our button maker at

and Dane Ward (Chicago: Association of College and Research Libraries, 2000), 4; Walsh and Kahn, *Collaborative Working in Higher Education*, xvii; R. David Lankes, *The Atlas of New Librarianship* (Cambridge: MIT Press, 2011), 170; Joseph Fennewald, "The 'Commons' Manager: Coordinator and Collaborator of New Learning Spaces in Academic Libraries," in *Partnerships and New Roles in the 21st-Century Academic Library*, ed. Bradford Lee Eden (Lanham: Rowman & Littlefield, 2015), 126.

⁵ Ruben Puentedura, "Transformation, Technology and Education," (Strengthening Your District Through Technology Workshop, August 18, 2006), <http://hippasus.com/resources/tte>.

various events with some success. However, our campus understands making primarily in terms of computer-mediated interactions with digital tools, and when people talk about the campus makerspace, they mean the room in the computer center staffed, funded, marketed and assessed by academic computing. Academic computing has secured grant funding to purchase equipment and repurpose existing space, hosted events to raise the visibility of digital making, and funded competitive technology grants to incentivize faculty to use the space, applying institutional resources to shape campus conversations about making in a way that our library simply could not match.

Critical scholarship is the best way to probe into points of tension and contradiction in our work, such as the feeling of disillusionment that comes when collaborators discover that the outcomes of their partnership don't match the ideals that initially motivated them to seek an alliance. Critical scholarship is a process of “denaturalization” enabling us to examine things that would normally go unseen because they are assumed to be unexceptional or inevitable.⁶ Critical scholarship also bears the responsibility for proposing a better alternative to replace what is being critiqued.⁷ In this chapter I denaturalize makerspace collaboration by proposing that technology projects in libraries are influenced by neoliberal ideologies and a Western tendency to view technology as objects to be exploited. As an alternative, technology can be treated as relational and grounded in the needs of human communities, and collaboration can be understood as a process centered around Freirean dialogue. My goal is to inspire approaches for creating and re-creating technology-infused learning spaces on terms that empower our users – and our colleagues – to better realize their aspirations.

Collaboration as neoliberal instrument

This section explores the ideological foundations of the common understanding of collaboration as a process involving reason, choice and agreement. It is important to

⁶ Christopher Grey and Hugh Willmott, *Critical Management Studies: A Reader* (Oxford: Oxford University Press, 2005), 5.

⁷ Jonathan Cope, “Four Theses for Critical Library and Information Studies: A Manifesto.” *Journal of Critical Library and Information Studies* 1, no. 1 (2017), 7, <https://doi.org/10.24242/jclis.v1i1.30>.

explore the philosophical basis for collaboration because ideology and practice are reciprocally related: what we believe as librarians shapes what we do in libraries and how we experience our environment, while what we do and experience also influences what we believe to be true. I propose that makerspace collaboration often takes place under common understandings of technology as objects to be exploited, and partnerships as processes of aligning and realizing self-interest, in an environment of resource scarcity where the goal is to maximize efficiencies. These understandings were developed through the historical interaction of multiple ideologies and have reached their present state under the influence of neoliberalism, a defining ideology of contemporary Western society.

Neoliberalism as a philosophical movement draws on multiple historical developments and other Western philosophical traditions to redefine the notions of property, markets, common welfare, and political-legal frameworks.⁸ Neoliberalism holds that human well-being arises from ownership of private property, participation in free markets and trade, and individual entrepreneurship, and that government intervention should be limited to only what is necessary to secure these conditions for individuals.⁹ When put into practice through economic policy and governance, neoliberalism acts as a conserving force to support existing power relations and orients human behavior around economic principles of rational choice, optimization of self-interest, and competition over scarce resources. This results in “a logic of ruthless individualism which forces individuals to be primarily responsible for their own well-being.”¹⁰ Neoliberalism leads to a view of education as job training to enable participation in labor markets; this is necessary protection for individuals in an economy oriented around maximizing financial return to capital owners and market investors. The work of schools, libraries and other institutions of learning is thus valuable only insofar as it helps fulfill the demands of the economy.

⁸ Rachel S. Turner, *Neo-Liberal Ideology: History, Concepts and Policies* (Edinburgh: Edinburgh University Press, 2008), 247.

⁹ David Harvey, *A Brief History of Neoliberalism* (Oxford: Oxford University Press, 2005), 5.

¹⁰ Nathaniel Enright, “The Violence of Information Literacy: Neoliberalism and the Human as Capital,” in *Information Literacy and Social Justice: Radical Professional Praxis*, ed. Lua Gregory and Shana Higgins (Sacramento: Library Juice Press, 2013), 31.

Neoliberalism carries three implications for technology collaborations. First, the view that the common good is best realized through private sector activity results in policies that underfund public institutions such as governments and schools, creating an environment of perpetual resource constraint and pressure to innovate quickly. Kezar and Lester thus describe collaboration as an “intuitively good idea” given mandates from funders, governments and accrediting bodies to show immediate results.¹¹

Second, collaboration comes to be viewed as a strategy that may provide an advantage in this environment of scarcity. Actors who manage to sufficiently align their interests to reach agreement on the terms of their alliance can pool their financial, intellectual and experiential capital and improve their outcomes, while still holding on to their defining attribute – the ability to choose individually and autonomously. Here we see echoes of Newell and Bain’s definition of collaboration which emphasized rationality, choice and agreement. Negotiation is key to collaboration under this model; for an alliance to move forward, each party must acknowledge it is in their self-interest to agree to the partnership. This requires delicate balancing acts to establish objective criteria for the negotiation and provide each side with enough “wins” to motivate agreement.¹² When partners have different levels of power or access to resources, collaboration carries inherent risks under this model – particularly for the less advantaged collaborator, who may be pressured to agree to an inequitable partnership, or lose access to badly needed resources altogether because the stronger party decided the alliance offered insufficient benefit.

Finally, information technology is valued for its ability to optimize decisions through the accumulation, transfer, and analysis of data, and for its flexibility in adapting to all sectors of the economy. Information technology is thus seen as “the privileged technology of neoliberalism,” an inherently beneficial force that should be applied wherever possible.¹³

¹¹ Kezar and Lester, *Organizing Higher Education for Collaboration*, 3.

¹² Roger Fisher, William Ury, and Bruce Patton, *Getting to Yes: Negotiating Agreement Without Giving In*, 2nd ed. (New York: Penguin Books, 1991), 13.

¹³ Harvey, *A Brief History of Neoliberalism*, 165; 159.

This view helps explain the popularity of technology-adoption frameworks in education, such as the SAMR model espoused by my collaborators in academic computing, which has been criticized as a prescriptive hierarchy focused on maximizing technology-mediated change.¹⁴

Harvey insightfully recognizes that neoliberalism could not become dominant without appealing to shared values and conforming to a pre-existing social environment, thus appearing to be “common sense.”¹⁵ Understanding technology and technical work as ways to maximize efficiency and realize one’s interests should not be seen simply as a recent aberration in our thinking, but rather in the context of a Western epistemology centuries in the making. Popowich explains that ever since the Enlightenment, “technology [has been] thought of as an extension of the natural world ... something to be dominated and controlled.”¹⁶ The formal project management (PM) techniques used to structure technology work in most industries, including libraries, are similarly concerned with controlling and ordering the surrounding environment. These techniques presume “a functionalist, instrumentalist view of projects and organizations, where the function of PM is taken to be the accomplishment of some finite piece of work in a specified period of time, within a certain budget, and to specifications ... this possibility typically assumes rationality, universality, objectivity, and value-free decision making, and the possibility of generating law-like predictions in knowledge.”¹⁷ An understanding of technology as primarily a way to maximize efficiency thus rest on prior assumptions that the environment can be ordered, controlled, subjected to reason and parsed as objective knowledge.

¹⁴ Erica R. Hamilton, Joshua M. Rosenberg, and Mete Akcaoglu, “The Substitution Augmentation Modification Redefinition (SAMR) Model: A Critical Review and Suggestions for its Use,” *TechTrends: Linking Research and Practice to Improve Learning* 60, no. 5 (2016), 439, <https://doi.org/10.1007/s11528-016-0091-y>.

¹⁵ Harvey, *A Brief History of Neoliberalism*, 5.

¹⁶ Sam Popowich, “‘Ruthless Criticism of All That Exists’: Marxism, Technology, and Library Work,” in *The Politics of Theory and the Practice of Critical Librarianship*, ed. Karen Nicholson and Maura Seale (Sacramento: Library Juice Press, 2018), 52.

¹⁷ Damian Hodgson and Svetlana Cicmil, “The Other Side of Projects: The Case for Critical Project Studies,” *International Journal of Managing Projects in Business* 1, no. 1 (2008), 145, <http://dx.doi.org/10.1108/17538370810846487>.

Critical scholars directly connect these presumptions to the ideologies responsible for structural inequality. Freire suggests that the root cause of oppression is an objectifying experience of power which creates “in the oppressor a strongly possessive consciousness – possessive of the world and of men and women ... the oppressor consciousness tends to transform everything surrounding it into an object of its domination. The earth, property, production, the creations of people, people themselves, time – everything is reduced to the status of objects at its disposal.”¹⁸ de Jesus contends that historical patterns of objectification constitute the ideologies responsible for structural inequality in the United States, including racism, colonialism and Orientalism; these ideologies have been legitimized by democracy as the outcome of free elections and the impartial rule of law, and then perpetuated by institutions such as schools and libraries which claim to uphold democracy.¹⁹ Once technology is seen as an object, it can easily be called upon to create prescriptive planning systems intended to maximize efficiency and effectiveness which serve to exclude people along categories of difference.²⁰ The work of these critical scholars demonstrates how neoliberalism endures as a structuring ideology because of an epistemology which regards one’s environment as an external object and a resource to be exploited. This attitude of objectification has shaped Western understandings of technology and technological work and encourages us to view makerspace collaboration primarily as a way to maximize efficiency and realize our interests. However, adopting this perspective impairs our ability to imagine how we would orient makerspaces to advance social justice.

Collaboration as relational dialogue

Paulo Freire’s *Pedagogy of the Oppressed* provides a lens through which collaboration can be understood differently as a relational dialogue. Freire does not succinctly define dialogue, but rather introduces it in relation to other concepts, beginning

¹⁸ Paulo Freire, *Pedagogy of the Oppressed* (New York: Continuum, 2000), 40.

¹⁹ Nina de Jesus, “Locating the Library in Institutional Oppression,” *In the Library with the Lead Pipe*, September 24, 2014, <https://www.inthelibrarywithaleadpipe.org/2014/locating-the-library-in-institutional-oppression>.

²⁰ Ursula M. Franklin, *The Real World of Technology* (Toronto: Anansi, 1999), 76; Angela Calabrese Barton and Edna Tan, *STEM-Rich Maker Learning: Designing for Equity with Youth of Color* (New York: Teachers College Press, 2018), 52.

with the proposition that the opposite of oppression is liberation. If oppression dehumanizes by objectifying the world, liberation humanizes as we strive for the right to live more freely alongside others also engaged in this struggle. Freire then amplifies his definition of liberation. He writes that liberation affirms human existence, and “to exist, humanly, is to name the world, to change it.”²¹ Naming is an exercise of power, a way of acting upon the outside world, but it does not necessarily give us the power to exploit the world, so much as create the potential to be in relationship to it. Think of the difference in how we interact with people in, say, a meeting or classroom, when we do or do not know or remember their names. Since liberation is relational, to liberate is to dialogue. Dialogue refers to communication – people committing to talk and work together – but also suggests a longer-term alliance that goes beyond meeting immediate needs and transcends self-interest. Freire says dialogue both requires and produces critical “thinking which discerns an invisible solidarity between the world and the people and admits of no dichotomy between them – thinking which perceives reality as process, as transformation, rather than as a static entity.”²² The familiarity of our environment is disrupted when we encounter partners in dialogue and find that they perceive things differently. Each time we have this realization our worldview changes in some way, however small, even though we may never fully understand or adopt our partners’ distinct perspective. When partners are open to this dynamic of dialogue, they are able to display solidarity, “entering into the situation” of people experiencing oppression, which is “a radical posture” and a risky “act of love. True solidarity is found only in the plenitude of this act of love.”²³ Liberation depends on recognizing that difference is an essential part of human nature and yet not an obstacle to our relatedness. Solidarity creates greater change: people who were once silenced now name the world; spaces once marked by dehumanization now affirm life. Freire is careful to point out that this is not the privileged “saving” the oppressed, but rather distinct subjects meeting as equals to name and transform a shared world.²⁴ Dialogue ultimately creates

²¹ Freire, *Pedagogy of the Oppressed*, 69.

²² Freire, 73.

²³ Freire, 32.

²⁴ Freire, 148-49.

mutual trust and the opportunity for participants to continue to learn and grow together, laying a foundation for future collaboration and a deeper engagement with each other's concerns.

The nature of collaboration looks quite different under dialogue than under neoliberalism: engaging in open-ended learning rather than meeting finite goals as efficiently as possible; entering into the concerns and situation of others rather than focusing on satisfying one's interests; occurring in conditions of abundance rather than scarcity. Some writers have reflected on the relational nature of collaboration and their statements take on new importance with Freire's concept of dialogue in mind. Partnerships succeed when collaborators adopt a position of humility and recognize the limits to what they can independently know and verify.²⁵ When aware of the limits of their knowledge, collaborators proceed with an other-centered mindset, acknowledge that they are accountable and interconnected, and are open to learning from their partners.²⁶ Knowledge created by these collaborations is not stable, rational or predictable; it does not exist apart from participants but is created when they "wonder together": "we work together to bring into being dreams that would otherwise lie dormant in the imaginations of separate people."²⁷

This mindset poses intriguing possibilities for makerspace creators. Instead of aligning individual interests at the start of a partnership in order to maximize efficiencies later, what if we approached collaboration seeking to recognize our mutual interdependence with our partners? Instead of treating project work as a process of gathering and exploiting resources, what if we remained conscious that the materials we work with (ideas, people, natural and manmade resources, time) have inherent value unrelated to our ability to put them to work for us? Instead of making decisions only based

²⁵ Rebecca Aanerud, "Humility and Whiteness: 'How Did I Look Without Seeing, Hear Without Listening?'" in *White Self-Criticality Beyond Anti-Racism: How Does it Feel to be a White Problem?* ed. George Yancey (London: Lexington Books, 2016), 105.

²⁶ Raspa and Ward, "Listening for Collaboration," 7; Donna Lanclos, "Embracing an Ethnographic Agenda: Context, Collaboration and Complexity" in *User Experience in Libraries: Applying Ethnography and Human-Centered Design*, ed. Andy Priestner and Matt Borg (New York: Routledge, 2016), 31.

²⁷ Raspa and Ward, "Listening for Collaboration," 3.

on what seems certain and reasonable to imagine according to best practices and conventional wisdom, what if we also approached projects with openness and humility, seeking to learn alongside our partners and allowing the work to organically take shape through dialogue?

Implications for makerspace collaborators

I propose that librarians collaborating on a makerspace first examine the mindset with which we approach our work. We need to recognize how we are privileged as information professionals (particularly if we live and work in the Global North) as well as the ways in which our varying institutional situations can marginalize us with respect to likely partners (such as having lower pay or a contingent position, the historical gendering of librarianship as feminine, or the belief that library work is irrelevant now that information is “all online”).²⁸ Intersectionality helps us achieve a clearer view of our relationships to the various groups affected by a collaboration, such as students, other library colleagues, IT collaborators, or administrators. We must approach our work with humility, particularly when seeking to enter into relationships of solidarity. Activists recognize they cannot claim the title of “ally” for themselves, but the people they work with will know when it is deserved.²⁹ Collaboration through dialogue is an ongoing process that requires patience, endurance and the courage to embrace setbacks as part of the process of learning.

Second, we can use formal documents strategically to give voice to those with whom we are in solidarity by ensuring that process, structure and user needs are considered at the start of a collaboration. Mission statements, strategic plans and project plans are typically understood to legitimize the resource commitments needed to create and sustain a makerspace by appealing to institutional values and goals. However, these documents also render makerspace partners accountable to one another and mitigate some of the risk

²⁸ Shana Higgins, “Embracing the Feminization of Librarianship,” *Feminists Among Us: Resistance and Advocacy in Library Leadership* (Sacramento: Library Juice Press, 2017), 70; 86.

²⁹ Unsettling America, “Allyship & Solidarity Guidelines,” *Unsettling America*, March 3, 2013, <https://unsettlingamerica.wordpress.com/allyship/>

of conflict inherent in shared work. Formal documents are useful for these purposes insofar as they present a clear, authoritative perspective, but this comes at the cost of potentially erasing marginal voices and ideas that do not coexist easily with institutional norms. Walters and Van Gordon's suggestion that partners create memorandums of understanding (MOUs) at the start of a new partnership may be helpful here. Rather than signaling distrust of one's partners, these documents ensure that necessary conversations about structure and process take place and help those conversations to honestly acknowledge differences, leading to more balanced partnerships.³⁰ While Walters and Van Gordon do not discuss the potential for power imbalances in partnerships, MOUs can provide lower-status partners with a way to hold more powerful collaborators accountable – provided that the agreement is drafted equitably to begin with.

Insights from feminist writing collaborators may help address this caveat. O'Meara and MacKenzie demonstrate how different approaches to collaborative writing can affect the power dynamics within a partnership. They describe a method of collaboration called "compilation" which is reminiscent of the approach taken by my library and academic computing: here collaborators divide up responsibility for the work, with each partner working independently to complete "their" section. O'Meara and MacKenzie acknowledge this may be the best approach to take in some situations, but they also contrast compilation with another approach to joint authorship they call "melding." Here the authors each wrote a complete draft of their paper, then met to discuss the two drafts and create a third, hybrid version representative of each author's ideas. Melding proved an effective way to handle disagreement and represented "a double consideration of ideas," resulting in higher quality work.³¹ It was less efficient than compiling work done independently, but more effective at pushing past the impulse to settle for "what could be agreed upon and not what was necessarily true."³² Melding resists the temptation to foreclose on agreement and

³⁰ Carolyn Walters and Elizabeth Ann Van Gordon, "Get it in Writing: MOUs and Library/IT Partnerships," *Reference Services Review* 35, no. 3 (2007), 392.

³¹ Anne O'Meara and Nancy R. MacKenzie, "Reflections on Scholarly Collaboration," in *Common Ground: Feminist Collaboration in the Academy* (Albany: State University of New York Press, 1998), 218.

³² O'Meara and MacKenzie, "Reflections on Scholarly Collaboration," 219.

encourages partners to consider each other's ideas more deeply. This can give perspectives that aren't often heard the time and space needed to blossom into more convincing alternative visions to the status quo.

Finally, librarians can strengthen their ability to advocate with and for user communities by conducting ethnographic research about makerspace use. This suggestion follows from Freire's concept of dialogue as a participatory process that helps communities understand their own needs and resources, as well as O'Meara and MacKenzie's observation that melding worked best when they took time to discuss their audience before drafting their papers. Librarians are increasingly turning to ethnographic research to gain this sort of holistic understanding of user needs before designing new services and facilities. Lanclos explains that ethnography helps articulate the structural nature of complex problems and identify the diverse kinds of experience that must be brought together to solve these problems through collaborative work.³³ As a qualitative research method, ethnography shifts the focus of user research from "hard" data toward relationality and narrative and avoids objectifying the resulting knowledge. "There is a power in stories, in their relationships with one another, their resonance with a lived reality that is not effectively represented in spreadsheets and bar charts," Lanclos reasons. "Qualitative data gives us a chance to represent our patrons as people."³⁴ If my library had user narratives documenting students' interest in analog making to refer to, our conversation with academic computing might have gone differently. When the discussion veered back toward objectified notions of making and tool-adoption strategies like SAMR, we could have put the focus back on students' needs and suggested participatory design work with students as a way forward for our campus makerspace.

Calabrese Barton and Tan demonstrate how participatory design contributes to inclusive experiences of making through their participatory action research conducted with students aged 11 to 16 as part of a summer maker camp. The youth studied what made makerspaces inclusive through interviews, photo diaries, and visits to local makerspaces.

³³ Lanclos, "Embracing an Ethnographic Agenda," 30-35.

³⁴ Lanclos, "Embracing an Ethnographic Agenda," 25.

They prototyped ideas relevant to the needs of their communities, such as solar-powered scooters and light-up footballs for use in neighborhoods with infrequent public transit and few streetlights. They were encouraged to consider how their experiences with multi-generational poverty and social ties with extended family, churches or neighborhood clubs were relevant to their making. As they applied this insider knowledge to their designs, they were motivated to learn science, technology, engineering and math (STEM) concepts, but “digging more deeply into STEM took on local significance rather than reflecting a school and/or white male culture.”³⁵ Calabrese Barton and Tan conclude that making undertaken in the context of community engagement does not simply meet vocational demands to learn STEM; rather, making amplifies the needs of communities, making them harder to ignore.³⁶ This project embodies the spirit and methods of collaboration I have been describing. Calabrese Barton and Tan’s commitment to dialogue motivated their efforts to approach their students from a position of solidarity, their choice of participatory design methods, and their judgement about how much control to hand over to the students. The project intervened meaningfully in the lives of the student makers and resisted neoliberal understandings of making centered around acquiring job skills, adopting technology, and producing and consuming resources.

Librarians as learners and collaborators

Refuting neoliberal understandings of collaboration on technology projects is an ambitious undertaking that requires coordinated activity among librarians. The mindset of collaboration as dialogue that I have described in this chapter has to “scale up,” with critical reflection by individual librarians leading to organizational learning undertaken by entire libraries that yields insights adopted by the library profession. David James Hudson has remarked on how hard it is for librarians to undertake this kind of collective action at scale. He contends that learning is a political activity and maintains that the structuring ideology of librarianship is a “practicality imperative” which channels librarians’ professional growth toward incremental improvement and optimization of library workflows and away

³⁵ Calabrese Barton and Tan, *STEM-Rich Maker Learning*, 101.

³⁶ Calabrese Barton and Tan, *STEM-Rich Maker Learning*, 103.

from constructing abstract or critical foundational knowledge. This discourages librarians from working collectively toward social justice, instead communicating that it is up to individual librarians or single libraries to solve problems with structural causes.³⁷ Clearly, we need to resist the notion that only readily applicable knowledge is worth pursuing, and instead support our colleagues in developing a holistic understanding of the problems facing our society and our profession's roles in working toward solutions. Librarians need supportive spaces in our libraries and in the broader professional world to engage in the difficult and often vulnerable process of learning through dialogue and critical reflection.

Systems and technology librarians have a crucial role in the process of initiating dialogue around makerspaces, since they are often tasked with leading makerspace initiatives and representing the library in collaborations. Observers have noticed how the “clashing cultures” of libraries and technology centers complicate the efforts of their staff to work together, and found a similarly unproductive dichotomy between “traditional” and “technological” librarianship.³⁸ Systems and technology librarians inherit both of these organizational cultures and may be able to use intersectionality to their advantage, helping translate a relational mindset regarding collaboration into terms that make sense to partners. Regardless of one's functional role, libraries need collaborators committed to long-term dialogue and trusted relationships of solidarity rather than short-term wins and temporary alliances of convenience. When our definitions of success, values, and methods diverge from those of our partners, we need to recognize these moments as the signals to foster dialogue. Hopefully we will each learn something new in the process. Collaboration teaches us we are all interdependent and we succeed or fail together, not on our own.

³⁷ David James Hudson, “On Critical Librarianship and Pedagogies of the Practical” (Critical Librarianship and Pedagogy Symposium keynote, February 25, 2016), <https://repository.arizona.edu/handle/10150/612654>.

³⁸ Edward D. Garten and Delmus E. Williams, “Clashing Cultures: Cohabitation of Libraries and Computing Centers in Information Abundance,” in *Books, Bytes and Bridges: Libraries and Computer Centers in Academic Institutions*, ed. Larry Hardesty (Chicago: American Library Association: 2000), 61; Dale Askey and Jennifer Askey, “One Library, Two Cultures,” in *Feminists Among Us: Resistance and Advocacy in Library Leadership*, ed. Shirley Lew and Baharak Yousefi (Sacramento: Library Juice Press, 2017), 128.

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