Tensions and Possibilities for Political Work in the Learning Sciences

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Abstract: How can the learning sciences engage more directly with the political dimensions of defining and studying learning? What might this engagement offer for democratizing learning? This paper delineates a tension between deep studies of learning and explicit attention to issues of power, inequality and human dignity. We frame this as a productive tension that will generate new insights, as well as conceptual and methodological tools that contribute to the democratization of learning. We identify a history of ideas inside and outside the learning sciences that inform this objective, including the political dimensions of the field's founding theorists. We then offer examples of ways these tensions manifest in our own empirical work, and conclude by considering how explicit attention to political dimensions of learning can advance our theories about what learning is, about what it is for, and about the conditions that give rise to deep forms of learning for all.

Expanding Space for Politics in the Learning Sciences?

In this article we are grappling with the following questions: How can the learning sciences engage more directly with the political dimensions of defining and studying learning? What might that engagement offer for democratizing learning? Addressing these questions is crucial to educators and designers of learning environments who share a commitment to working with youth and communities contending with marginalization. The work is underway (Bang, et. al, 2012; Gutiérrez, 2008; Lee, 2001; Nasir, Roseberry, Warren & Lee, 2006). We believe the time is ripe for making this a more central preoccupation of the field. In our view the learning sciences has a political tension—a tension that has emerged as a shared thread across our work. Here, politics refers to explicit attention to issues of power, hierarchy and inequity, and to the roots of those issues. The field also has an edge that can ground and inform the work of colleagues in other fields who directly address political dimensions of education—we know how to investigate *learning* with methods that trust and are informed by locally situated social actors and their multiple forms of practice and knowledge. Here, we will describe the boundaries of this tension, ground the discussion in examples from our own work and propose a theoretical stance that privileges human dignity as a central concern.

A key strength of scholarship in the learning sciences is in the combined commitment to theories that explore learning as situated in the lives and practices of people (Dewey, 1942; Vygotsky, 1978; Lave, 1987 Gutiérrez & Rogoff, 2003) while drawing on grassroots methods in research design (Hawkins & Pea, 1987; Barab, et al., 2004; Barab & Squire, 2004;). Theory offers a way of explaining phenomena of concern, but we sense an apparent contradiction within our field about what we want to explain. At times, learning sciences can orient toward a dominant frame regarding the purposes of education and learning: educational achievement and competition in a global marketplace. This frame was not created by the learning sciences, but the field is responsive to it. This frame is expressed in a variety of ways, yet competition remains the organizing feature. In this view individuals prepare to compete within an economic system and, through that system, collectively contribute to a country's economic standing—and in turn, degree of control (Eckert, 1989; Varenne & McDermott, 2008). In the learning sciences, this looks like a commitment to developing expert knowledge and deep conceptual understanding without a broader attention to the political and economic factors that shape and constrain trajectories of learning. We have operated as a future-oriented field, researching and designing toward learning environments that can consistently yield deep conceptual understanding, reflection, and expert knowledge that can serve our practice in the world (Sawyer, 2006). The challenge arises when we fail to or choose not to articulate to what end. In those cases, the dominant narrative is ready and waiting to absorb that future as its own. Put another way, it is one thing to marshal support for strong systems of education through calls to prepare people to be effectively competitive—people tend to envision being on the succeeding end of imagined competitions. It is the *same* thing, although not often articulated, to establish losers in the competition. This is where the political tension becomes taut.

An alternative frame places its emphasis on human dignity as a mode of inclusion. Again, this alternative frame did not originate within the learning sciences, but the field clearly desires to be responsive to it (Esmonde & Caswell, 2010; Nasir & Hand, 2006; Nasir, et al., 2006). In this view, varied, localized, cultural ways of knowing can yield respect, reflection, and cooperation—if not riches. Notably, voices in the field organized in this way tend to express the politics at play in the work of learning and knowing. In this frame, deep conceptual understanding and the practices of novices and experts are still key features of the work. The

distinction is in making human dignity and social equity the primary commitments. With this commitment comes a more explicit attention to the kind of future that is embodied and potentially engendered by alternative educational designs and practices. Where new social and political visions are made explicit, research on deepening conceptual understanding and expertise also takes shape differently: intellectual activity is understood as embedded in social relations; those social relations can either reproduce or reimagine and transform the hierarchies (raced, classed, gendered, aged, nationalized, etc.) and forms of competition that uphold the status quo. Thus, in addition to treating learning as a cognitive, affective and social process, understanding human learning as a fundamentally political process can lead to distinct empirical insights, designs and methods. Where we do not actively attend to political dimensions in learning, we can reproduce depoliticizing currents that weaken our analyses, making it more difficult to scale our work across settings.

Building on Two Active Modes of Theorizing

One way to illuminate this distinction is to consider two active modes of theorizing in the learning sciences. One approach is to theorize in ways that yield scalable designs to support learning in various disciplinary contexts:

> Unlike these previous generations of educational research, learning scientists spend a lot of time in schools—many of us were full time teachers before we became researchers. And learning scientists are committed to improving classroom teaching and learning—many are in schools every week, working directly with teachers and districts. Some even take time off from university duties and return to the classroom, teaching alongside teachers and learning how to make theories work in the real world. This is a new kind of science, with a goal of providing a sound scientific foundation for education (Sawyer, 2006, p. 15).

When we theorize from this place, we emphasize science that is grounded in real practices and lived experiences of students, teachers, novices, experts, and professionals. We also tend to prioritize schooling, even as we draw from understandings of learning in everyday life. In and of themselves, these are not overtly political moves. Rather they allow us to reveal practices—local or disciplinary—around which knowledge can be jointly produced. Learning, then, is understood in terms of its depth and effectiveness for yielding flexible and adaptive expertise. This is the bread and butter of the field and we are making meaningful progress. Still, systems that privilege some and marginalize others persist. This is a concern the learning sciences also takes seriously.

A second mode of theorizing holds tightly to local practices that are culturally mediated. With this lens, practices that support learning are somewhat freed from the disciplines and can be rooted in a wide variety of activities and cultural spaces (e.g. sports and games, shopping, organizing and activism, etc.). When our lens is focused on cultural ways of knowing and doing, politics have more freedom to emerge through processes of negotiating meaning. We are interested in extending these situated, sociocultural modes of theorizing by investigating what it would mean for the *method* to scale while the design itself may not. If the learning sciences is to emphasize human dignity, we need to theorize in ways that may not be scalable in a strictly scientific sense. That is, "a sound scientific foundation for education" might be upgraded to sound human-centered methods for learning where knowledge is not only co-constructed but also politically active.

A Good Problem

This is a problem—a good one—because the tension here is productive. The field is primed to debate the merits of how learning is characterized—as learning for its own sake, as a necessity for democratic life, as a necessity for economic participation, as a necessity for humanization. Ours is not the first field to take up these overlapping roles, but ours is positioned to provide leadership on what to privilege, why to privilege it, and how what we design leads us to these ends. This is so because our methods merge cognitive and computational ways of investigating understanding, ethnographic attention to the meaning people make together, and design practices that are iterative and rooted in a sociocultural theoretical stance. For these reasons, we are arguing for the learning sciences to become more attuned to the field's own dominant and marginal voices. Our interdisciplinary work is still situated in a stratified world, and we must take seriously the reality that we are also susceptible to being organized by dominant ideologies. This practice will organize us to think about how to include work that engages directly with political aspects of learning in ways that push and grow the field in directions that urgently reimagine social relations and the systems that support them. This is a critical intention, so we will dwell here for a moment.

The tension we are highlighting has a longer history in arguments that pit science against politics and emotion and ensnare scientific discourse and rationality. In search of universal principles, the humans can get lost. Yet too much emphasis on the local particularities of lived experiences might impede the effective application of what is learned more broadly. Harris and Shultz (1993) took this up in the field of law from the standpoint of reason and emotion—in the law, it seems, emotion has had an unscientific reputation. In the article, the authors called for reunification of reason and emotion:

> Emotion ruled off the official educational agenda remains unchallenged, unexamined, and undisciplined by reflection and analysis. Emotion made impermissible becomes emotion disowned, emotion for which no one is responsible….If emotions are successfully repressed, rationality suffers in any case. Draining intellectual arguments of emotion also drains them of meaning….Rationality unchallenged by emotion makes legal analysis an abstract exercise. The result is not only boredom but legal thought this both technically precious and practically irrelevant (Harris & Shultz, 1993, p. 1780).

Similarly, this phenomenon is reflected in research on learning and education – where politics may have an unscientific reputation. This is a tension that persists between researchers and educators. Indeed, it can interrupt practical and intellectual momentum. Happily, the learning sciences are organized to confront this reality.

The wedding of interdisciplinary theories (e.g. sociocultural and cognitive), with interdisciplinary methods (e.g. ethnographic, design-based, and computational) allows for ecologically grounded empirical research that can effectively take up politics that permeate learning both as practice and becoming. This is why we are concerned with what can at times feel like a depoliticizing context of research and theorizing. Studying learning in a highly stratified and competitive world is not a neutral act. All research has a perspective and is therefore political. But some research gets seen from a positivist perspective as "political" and thus subjective and advocacy driven—qualities which are in turn framed as less legitimate. We are suggesting this is one of the mechanisms through which more political voices get marginalized. In this way, we are viewing ourselves—scholars engaged with the learning sciences—as learners and our sites where intellectual work is shared and debated, as a learning environment. If we are interested in what the learning sciences can offer for how to democratize learning, we need our theoretical and methodological tools to help us wrestle with inequity and dehumanization. We need them to organize our investigations to ensure that teaching and learning are humanizing experiences and to understand the myriad ways this can look. When political approaches are embraced as a valid and necessary thread of work, the learning sciences themselves will be strengthened.

Concepts Related to Political Dimensions of Learning: A History of Ideas

In arguing for a more direct engagement with the political dimensions of learning, we situate ourselves within a history of ideas and research in the learning sciences that has sought to develop adequately complex and human-centered conceptual and methodological tools. This includes, for example, work that treats learning as a fundamentally cultural process and draws explicit connections between this approach and the wider social, political and economic constraints on learning for youth and communities (Gonzalez, 2005; Nasir, et. al., 2006). The recent special issue of *Human Development* organized by Nasir and Bang (Eds., 2012) is an example of this approach. As Lee (2012) writes: "The problem space the contributors to this volume have taken on is inherently complex because it entails multiple levels of context: the immediate setting in which individuals participate; relationships across the multiple settings that people navigate; the broader cultural, political, economic, and, indeed, ideological belief systems and institutional configurations in which these micro-level settings exist."

In our own work, we are drawn to micro-level analysis for the ways it helps ground research in moment-to-moment pedagogical practice and the perspectives of children, youth and adults in educational settings—both inside and outside of schools. This close attention to micro-level practice is one of the hallmarks of research in the learning sciences. At the same time, if our analysis only focuses on the learning of disciplinary content without attending to the ways developing new understandings intersects with questions of epistemology and identity that in turn reflect broader political and economic inequalities, then the theories that emerge from our analysis may be inadequate as tools for equity oriented design and pedagogy. This is where embracing political dimensions of learning can help imbue the learning sciences with analytic tools that allow us to study educational relationships, interactions and experiences as deeply connected to broader social problems and visions. The theories and methods we develop are our technologies for reconnecting with the more political side of the history of ideas around learning. These tools are essential to carrying forward the field's stated goals.

What are some of these tools? Within the field, we are drawn to socio-cultural or cultural-historical approaches for their attention to the centrality of cultural mediation (Wertsch, 1998), to human activity or cultural practices (rather than individual behavior) as units of analysis (Cole, 1996), to the deeply social dimensions of learning and their relationship to human potential and possibility (Vygotksy, 1978; 1986), to tensions and contradictions as progenitors of change (Engeström, 1991; Gutiérrez, Baquedano-Lopez, & Tejeda, 1999) and to ecologically valid forms of research (Cole, Hood, & McDermott, 1997). Many of these concepts have their roots in political problems and concerns. For example, ecological validity emerged in part from a critique of research that measured human intelligence based on normative cultural tasks, leading to deeply problematic conclusions about the intellectual capacities of non-Western communities, both inside and outside the United States. This political and humanistic critique was attuned to relationships between psychological/educational research and colonial ideologies and practices and to the need for researchers to

reflect on their own assumptions. Such critical and reflective modes of research engendered new methods that understood cognition as embedded in cultural practices (Scribner & Cole, 1988) and studied learning as a situated activity, an approach that revealed intelligence and ingenuity where deficit had been assumed.

Thus, while some of these concepts and approaches sit comfortably within the learning sciences, we are interested in what can be learned from making explicit the political critiques that brought them into being—and what openings might emerge in future strands of work. Similarly, we seek to explore both the political commitments of founding figures within the field, such as Dewey, Piaget, Vygotsky, Papert and Bruner, and how these concerns gave shape to their ideas about learning. Highlighting these concerns can help connect their theoretical contributions to the economic and political tensions outlined above—namely the purpose of education in a democracy, and the role alternative assumptions and approaches to learning can play in helping bring about an egalitarian future. This theoretical work can help counter currents of de-politicization—where theories of learning are explicitly or implicitly stripped of their critical bent. Revisiting the political context within which such foundational contributions emerged can also help us understand their/our blind spots (around race, or gender for example) and what these mean for our thinking today.

At the same time, some of the ideas and scholars we are drawn to may hold a more marginal place within the field. For example, the work of Paulo Freire (1985) and the traditions that grew from his contributions directly attend to problems of dehumanization and humanization, oppression and liberation as tied to educational theory and practice. Similarly, critical race and decolonizing approaches to education make central the role of race and racism in the educational experiences of students of color, and offer alternative methodologies for community-based research (Paris & Winn, 2014; Smith, 1999; Tejeda, Espinosa, & Gutiérrez, 2003). Do these ideas have a place within the learning sciences? Are they seen as overtly political and therefore less "scientific"? What new tools might emerge from greater dialogue across these traditions? In his commentary on the aforementioned special issue of *Human Development* Cole (2012) writes,

> What is much less certain is whether it is possible, on a mass scale, to so reform schooling that the kinds of exceptional interactions that appear to unleash student creativity become the norm, not the exception. However persuasive the arguments for reframing and desettling educational practices may be, they run directly against the powerful forces that seek to amplify the effectiveness of a scientific world view in which triumph over nature, and over other humans considered less-than-human, is considered an economic and political imperative (p. 346).

Though many within the field of learning sciences would agree with the goal of making 'exceptional interactions that appear to unleash student creativity the norm rather than the exception'—and are actively involved in research that works towards these ends—we are interested in the kinds of shared thinking, dialogue and research that would become possible through equal and explicit engagement with the 'powerful forces' that blunt the fulfillment of this possibility for all students.

Political Possibilities: Some Examples from Our Empirical Work

Our proposed framework therefore problematizes the overt or subtle de-politicization of learning—including dominant assumptions about what constitutes legitimate empirical research—and seeks to illuminate when and how moving towards rather than away from politics may yield practice-based alignment with the theoretical goals and premises of the learning sciences. One narrative suggests foregrounding the researcher's values makes both a weaker researcher and weaker research. But if, in turn, we ignore the presence of values in our data and analysis, that also weakens the research. This tension opens a kind of critique that expands where the field can go and what it can do. When and how are political perspectives necessary for thorough research on learning, and what kind of future are we implicitly working to bring forward? In our work, these questions emerge in a wide range of contexts and disciplinary orientations. In this section we consider what we gain by taking a political view of learning in each of our settings and how that is connected to democratizing learning in those settings and more broadly.

Civic and Political Practice

Booker conducts community-based research with youth and attends to how they learn to engage as civic and political participants. Her studies are framed by a combination of sociocultural theory, cultural studies, and political sociology. Sites for research have included community, family, and school contexts, particularly at their points of intersection where learners can privilege their own expertise while generating meaningful learning opportunities (Goldman, Booker, & McDermott, 2007; Booker, et al. 2011). The focus on civic participation and political development derives from a concern with democratized learning and barriers that limit access to political analyses and critiques.

In a study of a student advisory board of high school students attempting to influence school district

policy making, three aspects of civic and political development became critical: technical, pragmatic, and political framing of their work (Booker, 2010). Technical frames were based in learning and applying civic knowledge (e.g. how policy is made and implemented). Pragmatic and political frames defined actions (e.g. organizing supporters, engaging the media, explicitly engaging in power analysis, etc.). Two analytical understandings of their work emerged. When examining the data for learning and outcomes, a tidy linear progression emerged that suggested students first had to learn the technical requirements for doing policy work. This was followed by a period of pragmatism where the group acted in ways most likely to receive support from adult decision makers while addressing important student concerns. Finally, they used political frames to make their views known in a contentious public debate, criticizing the Superintendent's signature school reform program and calling on her to renegotiate her contract in response to severe budget cuts. A second analytical strategy foregrounded politics to examine where youth, community groups, district leaders, adult allies, and members of the press gave explicit attention to issues of power, hierarchy and inequity. This analysis revealed the students' nearly constant use of technical, pragmatic, and political frames to negotiate meaning and action.

The linear picture, by itself, left substantial room for interpretation. The journey from technical to pragmatic and then political frame could be a straightforward learning trajectory. Or, it could suggest that political frames came into play as a form of hubris at best or co-opting by opportunistic adults at worst; the actions of oppositional adults implied this interpretation. A third read was that youth were selecting political frames to advance their agenda, and it was a sign of sophistication. This was an interpretation shared by youth and allied adults. Analyzing data with specific attention to politics as a fundamental aspect of the learning environment as well as policy-making practice revealed all three frames were evident in practically every event in which the student advisory board engaged. They constantly negotiated the meaning of their collective work by filtering possible actions through these frames and addressing the vulnerability of their positions in hierarchies of power—as youth from a variety of backgrounds, students who were subject to the authority of adults, elected representatives of their peers, advisors with no real vote, etc. They made political choices, even when the outcomes of those choices appeared technical or pragmatic.

What was gained by engaging political dimensions of learning? The yield distinguished practices employed by youth to democratize their own learning and participation experiences and the consequences they suffered for it. Possibilities for youth and communities alike were constrained simply by defining the student advisory board as a place for learning—as opposed to participation. Politics were implied in the actions, negotiations of meaning, and contradictions that emerged as the students discovered their influence, worked to wield it, and encountered resistance and support. It was necessary but not sufficient to examine what happened—it was also imperative to examine competing historical interpretations in relation to contested visions for possible futures. Dreaming possible futures and negotiating for their existence are fundamentally democratic practices. Nurturing possible futures requires the development of political practices because those futures do not develop in a vacuum. They develop largely to the degree that they displace existing practices.

Programmable Media

Hooper has studied children's learning with programmable media and construction of computational ideas from a sociocultural perspective. Her work has focused on classroom settings where teachers are explicitly engaged in supporting the learning of African American and Latino elementary school children. She has examined how the theoretical and design tools of constructionism (Papert, 1993) explain from a cognitive perspective that creating projects with classic constructionist tools such as Logo and Lego Mindstorms supports children's learning of math and science ideas. Her work has illuminated the role of a political stance through studies of programmable media in classrooms where teachers seek to include cultural experience in their pedagogical choices.

One study of second-grade students' explorations of geometry with programming in Logo revealed that students' use of turtle graphics supported their construction of geometric designs. It also revealed that the students' engagement with problem-solving and extending each others' ideas expanded when the pedagogical context included the use of discourse practices that were familiar to them. The teacher had a socio-political value orientation to using these practices as well as a constructivist one. From this stance, she instituted a sharing time for students to present and discuss successes and challenges in their projects with the whole class. This was similar to a math talk or poetry sharing time that had immersed the class in practices of sharing approaches to solving problems, offering writing for communal critique and review, and affirming each others' progress. She encouraged a discourse formed by children's everyday ways of expressing their ideas and developing academic discourse that was mutually constituted by her modeling and interactions between students that were comfortable and respectful. Her stated goal was for each student to "have a voice" in sharing their ideas, no matter what the subject-matter or level of academic achievement or English-language proficiency the student brought to the experience. In this class, all the students learned to believe they could share their ideas and their ideas would be heard and respected.

For example, during one of the sessions where this sharing practice was used, a student who was low in her academic achievement initiated a lively discussion of the trial-and-error process that she used to figure out

how to draw a hexagon using turtle graphics commands. This discussion placed her mathematical ideas in a valued position in the co-construction of computational ideas within class. This example illustrates the political nature of the teacher's choice to apply the sharing practice that had been appropriated by the class to work with programmable media. This pedagogical move supported students' negotiation of everyday voices with their learning in the new academic realm of computational thinking. Over time and close examination of these sharing sessions, it became clear that this practice was a scaffold for all students sharing ideas that took their learning with programmable media to levels of complexity they could not easily reach by using the tools on their own. Analysis of data from this study suggests the need for explicit attention to: 1) elements of learning environments such as socio-politically valued classroom practices, and 2) the designs of programmable media because these aspects are operating in concert to support children's learning of and with computational ideas.

Hooper has extended examination of learning based on constructionist design principles to learners working with digital design fabrication in informal settings. Based on her earlier work, this new work explores both the affordances of digital design fabrication as a constructionist tool and the importance of an explicit pedagogical approach that scaffolds learners in bringing their social and culturally rooted epistemologies to their work. The Spiro Inquiry (Hooper & Freed, 2013) explores creating spirograph-like designs with a construction kit that is made up of pre-fabricated shapes for exploring physical construction of designs, an app for constructing designs on-screen, and features of the app that enable the fabrication of gears and designs on lasercutters or craft cutters. Workshops have been designed based on a structure for inquiry-based science (Institute for Inquiry, 2006) that is designed to engage learners in identifying and pursuing their personal interests related to the mathematical ideas embedded in the work.

This work has implications for examining the political contexts of making and tinkering environments. It emphasizes that pedagogical structure can be designed to accompany the process of making with computational tools as a way to insure that multiple pathways to learning are supported. There is a political connection between equity and learning when multiple pathways are explicitly supported. This work exemplifies critical engagement with discourse in emerging fields of making and tinkering and the political and economic tensions that exist when design for multiple pathways to learning are not made explicit.

Migrant Youth in Hybrid Settings

Vossoughi has been engaged in ethnographic research on learning in hybrid settings that seek to meaningfully connect the development of disciplinary understandings with students' lived experiences. These settings blend formal and informal elements (school-like academic tasks and modes of engagement with apprenticeship models, play, familial social relations, and everyday language practices). In one setting, high school age migrant students worked with graduate students to analyze social problems relevant to the migrant community (displacement, economic exploitation, educational inequity, gender/patriarchy) through complex social theoretical texts and written genres. Here, she studies the ways social analytic tools became *consequential* to students—serving to deepen intellectual engagement and reshape social relations.

In this case, studying learning as a political process helped *make visible* the social and political work students were engaged in when drawing on academic tools to analyze social problems (a male student working to discuss patriarchy in careful ways, a student who was dominant in English reconfiguring the leader of her reading group so that a student who was dominant in Spanish could contribute his own words). Resisting common dichotomies (theory/practice, intellectual/political activity) this perspective can help us see classroom discourse as a site of struggle and change. At the same time, treating political conversations as arenas of learning highlights the intellectual work students were engaged in as they analyzed particular problems and experiences. This view can be used to organize and assert the value of political education as a potentially rich context for academic development, and to identify the specific forms of guidance and expertise involved therein.

Vossoughi draws on Matusov's (1998) work to identify the forms of development valued in this setting. According to this approach, we must not only ask 'did development happen?' – a question that assumes normative interpretations of what constitutes valued forms of academic engagement. Rather, we must first ask: what are the valued forms of development in this setting? This question moves us towards a more situated and emic understanding of learning, but it can also be used to surface dimensions of intellectual activity that may be undervalued by dominant measures and argue for educational self-determination (Vossoughi, Under Review).

STEM Learning Through Tinkering and Making

In a second study, Vossoughi is working with a team of educators and researchers to look closely at STEM learning in an equity-oriented after-school setting organized around tinkering and making (Vossoughi, et. al., 2013). This setting serves as a prime example of the shift towards scientific practices emphasized by the Next Generation Science Standards. Children work with facilitators to design artifacts that embed STEM practices in purposeful and artistic activity. However, her analysis of learning in this setting explicitly pushes back on discourses that treat equity (only) as a matter of expanding access among communities historically underrepresented in STEM fields and professions (or Making spaces) without critically engaging with the nature

and purposes of scientific labor and with the larger "Maker Movement."

These political concerns directly influence the ways she analyzes learning within the after-school setting: what counts as scientific? Are multiple ways of knowing supported or marginalized? When and how do STEM practices become meaningful tools? What measures are used to assess effectiveness—persistent participation in STEM fields and/or a palpably deeper curiosity and intellectual disposition towards tinkering that may manifest across a range of contexts? Here, studying learning as a political process allows us to include disciplinary content and expertise as objects of analysis, leading to distinct interpretations regarding young people's engagement with STEM. For example, students' complex and sometimes tension-filled relationships with "Science" as a discipline are not treated as misconceptions to be solved on the linear path towards diversifying STEM fields, but as legitimate efforts to make sense of a field replete with its own history and politics. In this way, critical questions about goals and assumptions of "Science" become seeds for imagining alternative possibilities with regard to who can engage in science, with what meanings, and towards what ends.

Advancing Learning Theory

What would effectiveness in this endeavor look like? Learning sciences can put to rest the remarkably persistent presence of deficit as a valid way to approach humans and learning. As a field, we already believe this and work toward it, but our work has not put this to rest. Rather it has responded to it. Here is a theoretical proposition: Where knowledge is depoliticized and deficit organizes the practices around learning, dehumanization is likely to occur through the reduction of what is seen to what is missing. The learning sciences can devise and investigate an alternative proposition because we are a field that merges cultural, cognitive, computational, and democratic design in service of deep reflection and understanding: Where knowledge is openly recognized as political and contested, and humans are always making sense through social and historical practices, humanization is likely to occur as we contemplate one another through disciplined reflection. The former proposition emphasizes what should be learned and whether it is effectively learned. The latter proposition emphasizes how learning occurs through practices of seeing and re-seeing each other.

This year's conference theme invited dialogue about practice, and each of us was experiencing a rift between theory and practice in our own work. Practice draws us into the lived experience of people—the location of our learning and becoming. Yet, if those experiences draw us toward political conclusions rather than discipline based, epistemic conclusions or scalable designs, it is an open question whether the political path is an open one within learning sciences scholarship. The fields' leadership in sociocultural theory opens the door, but it isn't swung wide. As a field, how are we learning and becoming? Do our practices allow us to become openly political actors in relation to our scholarship? Certainly, foundational thinkers of the field were engaged in these ways. Where can we carry those commitments today?

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