

Interrogating the Role of CSCL in Diversity, Equity, and Inclusion



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Abstract The underlying aim of this chapter is to contribute to efforts to build and organize the design landscape and vocabulary for conversations about diversity, equity, and inclusion (DEI) in CSCL. Anchoring our discussion is the position that DEI can only really be understood and achieved at scale. We have limited our scope to include the consideration of three critical issues—language, differentiation, and identity—that we believe serve to, however unintentionally, restrict or promote DEI in CSCL, perennial problems that often surface in complex software systems, which may prevent broad-based utility in applications, and how issues of DEI surface themselves in these designed tools and applications. We center this discussion in a few common CSCL applications: contexts like MOOCs, virtual high schools, and networked-based multiplayer games. We highlight three core DEI challenges present in the use of CSCL environments: language, differentiation, and identity as focal components that designers should be aware of as applications move to scale.

Keywords Equity · Diversity · Inclusion · CSCL · Language · Differentiation · Identity

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1 Definitions and Scope

In this chapter, we aim to stimulate a conversation about current concerns and opportunities for diversity, equity, and inclusion (DEI) in participation, design, and use of CSCL. To the extent that our field has taken up DEI, much of the focus has been on the role of design and designers in creating artifacts that find use in various contexts. We aim to emphasize a focus on *what* is being designed and how a spotlight on the inequities found within these designs could press designers with respect to the creation of more DEI-centric design dialogs. The primary focus of this chapter will be to present an analytic perspective on tools and applications that are designed for a broad cross section of people. We argue that such CSCL applications typically fall short in accomplishing DEI. Much of what we point to in CSCL, as tools and applications that are useful and usable by many are, instead, devoid of attention to the diversity in populations, the need to actively promote equity in access and use, and lack design considerations for the experiences, knowledge, and needs of diverse learners. Our aim is to put in sharper relief how focused attention on DEI presents a new round of design challenges for CSCL applications. A particular vantage point, important to this discussion, is that DEI is tied to problems of scale. Although we will develop this point later in the chapter, the idea guiding our analysis is that to genuinely understand the demands of DEI, we must look beyond small-scale examples of use and access for small groups of users toward projects that touch the lives of many users from a variety of backgrounds and abilities and tools that intentionally aim to understand and accommodate the interests, learning, and social interaction needs of all learners.

Diversity is not new. Our world has always been diverse, present even in the earliest art, games, and tools. The tools we create to inhabit the world have always, albeit tacitly, sought to serve a broad cross section of people. Too often, the tools we have created are simply not productively inclusive and, instead, reproduce inequity. What is a more recent phenomenon is what might be characterized as increasing demands for rightful attention to diversity and, concomitantly, considerations of what attention to diversity means with respect to the need for equity and inclusion. Consider, for a moment, the humble plastic strip bandage, most often described by the brand name Band-Aid. For each of the authors of this chapter, the Band-Aid, for most of our lives, was a stark example of designers' seeming lack of recognition and consideration of diversity and, certainly, a lack of effort toward equity of available options. The Band-Aid, itself, is useful. It provides a seemingly innocuous and aesthetically pleasing protection to a scar or cut. However, the level of innocuousness, or how well it fits into its environment (e.g., skin color, from our perspective), represents an abysmal failure. As designed, the Band-Aid simply did not represent the range of skin tones for all the people who were meant to use it. In essence, one way to see the problems of DEI is effectively addressing the presence of variation. The simple Band-Aid, which was designed to meet a specific need for all, works well for some people, sometimes. Addressing problems of DEI in CSCL and other

domains, at base, is figuring out how to make designed solutions work well for more people, more of the time.

We take the perspective that DEI, as it connects to CSCL, are not principal problems that exist at the level of prototypes and boutique efforts. While these sorts of efforts are important, and vitalize CSCL as a field, they are essentially attempts to uncover the *promise* of an idea. Problems of DEI are much more prominent when designers are directly trying to discern whether a promising idea can work for a broad cross section of people. Recently, our colleagues organized the CSCL 2017 conference where the conference theme problematized equity and access. That effort was meant to capture the field's evolution with regard to these issues at a moment in time. Our reading of the results of that effort brings us to two conclusions. First, while the concerns with equity and access are deep, ongoing work to actively address these issues is not widespread. Second, much of what was reported, in the CSCL 2017 published proceedings, was broadly connected to DEI, rather than DEI being the focus of the work. This, of course, makes sense when a conference is meant to capture the field's current perspectives on its ongoing work. In this chapter, we aim to build on the work of that effort, placing a sharp focus on intentionality within DEI. In particular, we hope to lay a foundation for conversations about DEI in CSCL, which will move us to a more common perspective and set of lenses through which designers, researchers, and practitioners can actively take up DEI within CSCL.

It is evident that diversity, equity, and inclusion are evolving notions. This evolution is shaped by society and, more specifically, by our field, through the development of more nuanced and, arguably, more sophisticated understandings of our assumptions about others and our responsibility as designers and researchers to them. Historically, diversity, in Western nations, meant having a representation of people, who were perceived to be culturally "different," typically nonwhite, in what we designed, tested, and/or studied. While a useful starting point, diversity framed by what it wasn't (i.e., white) was a blunt indicator. Perhaps our ideas, from a definitional perspective, need refreshing. So, in what follows, we start with what we mean by DEI. We then offer historical examples drawn from the field that reflect the field's attention to DEI and highlight what we believe to be evolving intentionality in that effort. We then provide examples from the current state of the art in CSCL and related fields that illustrate intentional efforts and their impact. We offer illustrations of research that, we believe, constitute exciting indicators of the direction that the field can, and should, take. Common across these examples is a level of intentionality around deliberately designing and conducting CSCL research for more people, more of the time. We conclude with implications of the current state of CSCL design for DEI for future design and research.

1.1 Defining Diversity, Equity, and Inclusion

As we awaken to, and in some efforts (mostly at the edges of CSCL), problematize the limits of our past and current engagement with diversity in our field, we believe it would be helpful to clarify each term. In this section, we offer definitions that we hope will help lay the foundation for a common language at the intersection of DEI and CSCL.

1.1.1 Diversity

Diversity-in-use, in our view, is a measure of the amount of variation that a design can accommodate and who can and can't use the designed tool for a desired outcome. Here, diversity, as a construct, includes phenotypical, gender, sexuality, behavioral, cultural, and a myriad of other ways that humans, institutions, and practices differ and represent their interests. For us, the term diversity captures the full frame of a person's intersectional identity. It is important to note that, while we mean those characteristics which are ascriptive, like race and gender, we also include those aspects of identity that are attributable via accomplishment and experience, like being a mathematician or surviving a car crash. We argue that design accommodating diversity should capture relevant ascriptive and attributive intersectionality. As a first step, we must be able to identify and understand the variation that exists in its entirety. We highlight relevance because it is plausible to consider that not all dimensions of an individual's or group's profile is activated in every design and use context. While the fullness of intersectionality is always present, only some aspects of it may be germane to effective use for any given design and context of use.

Second, we must appreciate the macro (e.g., cultural contexts), meso (e.g., intersecting ascriptive and attributed identity domains), and micro (e.g., family and neighborhood) systems in which users exist and operate. The multilevel complex conspires to create and maintain a range of variation in which a design can be effective. Next, with this multilayered system in view, designers need to develop a deep appreciation of how explicit aspects of the system engender variation and accommodation that ultimately result in utility and usability. It is in these multilevel appreciations that designs move out of the hothouse and lighthouse phases into artifacts that stably serve diverse communities. In this way, we position diversity as a figure-of-merit for an application, a noticeable deviation from typical characterizations of diversity. The ability to accommodate significant use communities as an index of quality in design requires a level of intentionality vis-à-vis diversity that, in our estimation, is not currently present in CSCL design communities. Later in this chapter, we offer a few examples of work that seek to do this and consider how problematizing the way we think about, and treat, diversity can support achievement of equity in outcomes.

1.1.2 Equity

Here, equity broadly refers to treatment that leads to fair outcomes, rather than equal treatment. Equity and equality are not the same. Equity is the extent to which a design can accomplish uniformly successful outcomes for its users and avoids successful outcomes being coupled to ascriptive or attributed variation like skin color, gender, ability, and location. Equity, in this view, can be seen as fairness in experience, access, and opportunity. A recent study by Starmans, Sheskin, and Bloom (2017) points to evidence that, in general, people value fairness over equivalence. There are situations in which people view equal treatment as fair, but other situations in which they view unequal treatment as fair. Equity is a process that, with intentionality, can lead to inclusion. From a design perspective, to accept equity as a figure-of-merit means that designers have to come to understand how to wield differentiation and intersectionality as a design resource. CSCL designs will need to discern variation and adjust what people see, which communities are promoted for membership, who mentors who, and so on. The idea is that the hallmark of inclusion from a social design resource perspective is better deployment based on what we know about who our users are and the aspirations they bring to an application. In turn, we suspect, this perspective leads to successful designs that are recognized, as such, from the vantage point of more users.

1.1.3 Inclusion

Firstly, inclusion is a perspectival outcome measure: It is what people see in what is presented to them. A more inclusive design is seen as welcoming by more people, and a less inclusive design presents people with elements that they see as systematic barriers to entry. For example, questions of inclusion are enjoined when nondominant users see CSCL designs as presenting barriers to their sense of belonging (Bolger, 2017). In considering inclusion, we borrow from work in Ability-Based Design (Wobbrock, Kane, Gajos, Harada, & Froehlich, 2011) and work in the Learning Sciences on asset-based framing (Pandya & Dibner, 2018). Within the ability-based design framework, there is a certain level of intentionality in how a tool is designed. In essence, any tool is designed to adapt to the abilities or strengths of the users. Part of this is achieved by being explicit, and inclusive, about one's assumptions concerning who will use the tool and how they will use it. Moreover, similar to work on asset-based framing, the central focus is on ability, not disability. Thus, the idea of inclusion goes beyond merely thinking expansively about a systems' users, but also valuing the unique contributions, ideas, insights, histories, etc. that may engage them.

As we in CSCL design, build and study the use of learning and community platforms and augmented reality spaces, our aim is to provoke a discussion about how these tools positively or negatively press DEI. Bolger (2017) perhaps sums it up

best in noting, “It’s about realizing that diversity efforts, without equitable practices and intentional inclusion, will always fall short.” Our CSCL challenge is to understand how to construct an infrastructure that makes it straightforward to keep DEI in view, in design, and, more importantly, to support intentionality around DEI throughout the research, design, and implementation process.

2 History and Development

In 2004, the theme of the ICLS was Embracing Diversity in the Learning Sciences. At that time, diversity was framed as complex social systems, considerations of variation in populations, institutions, and social contexts. Specifically, diversity was framed as “draw[ing] from a diverse set of disciplines to study learning in an increasingly diverse array of settings” (Steinkuehler, Kafai, Sandoval, & Enyedy, 2004, Preface). These concerns were framed as “challenges to studying and changing learning environments across levels in complex social systems.” As such, the conference chairs noted, “This demands attention to new kinds of diversity in who, what, and how we study; and to the issues such diversity raises to developing coherent accounts of how learning occurs and can be supported in a multitude of social contexts, ranging from schools to families, and across levels of formal schooling from preschool through higher education.”

A workshop at the 2017 Computer Supported Collaborative Work (CSCW) conference invited designers and researchers who viewed their work as supporting equity, inclusion, and accessibility to reflect about the role of subjects located “at the margins” of digital existence to consider how the work might demarginalize those who are researched, the research itself, and those who are researchers within the CSCW community (Dye et al., 2018). Similarly, the 2017 Interaction Design and Children conference featured a workshop on Equity and Inclusivity (Sobel, Kientz, Clegg, Gonzalez, & Yip, 2017). This latter workshop drew on ways that equity and inclusivity are closely related, noting that “[t]hese issues—equity and inclusivity—complement each other as we can use equitable practices and approaches to promote inclusion in our designs and methods” (p. 762) and highlighted both practical and theoretical considerations for conducting research among diverse populations, and for advancing issues of DEI. Recently, Schlesinger, Edwards, and Grinter (2017) employed a meta-analysis of how identity is portrayed and represented in the CHI Proceedings from 1982 to 2016. In reporting their findings, Schlesinger et al. (2017) urge designers and researchers to pay design and analytic attention to the current blunt state of identity representation in CHI research. Guided by intersectionality theory (Crenshaw, 1990) they note that “previous identity-focused research tends to analyze one facet of identity at a time” (p. 5412) rather than designing for, and analytically examining, the impact of design on, for example, a black, nonnormative-sexual male from a low-income rural background. In their call to action, the researchers remind us of what is lost when we fail to recognize the intersectionality

of people, the complexity of institutional users, and the role of power in learning with, and from, tools and practices.

In 2016, Booker, Vossoughi, & Hooper, 2014 asked the field, “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?” (p. 919). With respect to issues of DEI, the authors called for research and practice that seek to recognize, identify, and support “multiple ways of knowing” (p. 927) and a consideration of not only what should be learned and what learning effectively is, or isn’t, in understanding how learning occurs through practices across multiple contexts, people, and meanings attached to practices, tools, and content. In related work, Vakil, McKinney de Royston, Nasir, and Kirshner (2018) specifically urged our field, in collaborative design and in design-based research efforts to recognize and consider how issues of “race and power mediate relationships between researchers and communities in ways that significantly shape the process of research” (p. 194). In essence, our field and related disciplines are increasingly asking, “How (rather than why) might we interrogate the ways we design?” and “How and when (at what design point or points) can/should we consider diversity of participants, settings, and needs?” As a field, we are increasingly awakening to the import of interrogating how and why we design the way we do.

3 State of the Art

There are not enough CSCL applications in broad use to have a fulsome discussion about their DEI impact. Thus, we center our discussion on a few common CSCL applications that were developed outside of the CSCL community: online learning contexts like MOOCs, virtual high schools (VHS), and networked-based multiplayer games. These applications share three key components. First, they have had a broad societal impact and market penetration, satisfying our desire to consider DEI impact. Second, learning, implicit or explicit, arguably plays an important role in the successful unfolding of these applications. Third, social interaction, whether synchronously or asynchronously, evidence suggests, is an important element of accessibility and is at the center of the successful execution of these platforms. We feel the latter two characteristics (i.e., learning and social interactions) are among the first principles for CSCL applications. Space constraints prevent us from offering a full analytic treatment from the perspective of the design challenges that DEI presents to these applications. Rather, in the space we have available, we will take up examples of DEI challenges that appear in these, and related, applications. Our examples are chosen to highlight three of what we think of as the core DEI challenges present in the use of CSCL environments—language, differentiation, and identity.

From our perspective, without *language* in the world of CSCL, there is no opportunity to learn. In a world of significant variation in languages spoken and the way language is used to communicate, if CSCL designs are not attentive to language variation, the designs will significantly disenfranchise many potential

users. The challenge of *differentiation* is the recognition that one size never fits all. Moreover, just as learners rely on multiple ways of knowing in different configurations, the challenge of differentiation is to be sensitive to those configurations and to have the ability to reconfigure a learning environment in light of that. For us, the sensitivity to *identity* has to be a core function of CSCL environments. CSCL environments, at base, are social. And, for social settings to gain traction, each individual involved has to be able to recognize that they are being seen and understood for who they are, in all their complexity. In what follows, we attempt to show how language, differentiation, and identity present design challenges to CSCL environments.

3.1 Language

Language poses a barrier for many users of CSCL technologies and CSCL designers. In this section, we offer considerations for building and supporting DEI language environments in CSCL. Here, “language” refers to the linguistic knowledge and resources that users seek to make sense of content presented in CSCL technologies and the language they encounter in CSCL technologies. We highlight issues of language complexity, availability, and accessibility.

Language complexity refers to the challenges users face in comprehending expectations for tasks, recognizing and comprehending meaning (explicit or implied), and applying their literacy and language skills to genres. Presumptive literacies (Williams & Gomez, 2002), design-based assumptions about the literacy skills, background, and knowledge of the user, in the content and structure of technologies, present barriers to comprehension. They are often found in the expected uses of communication genres (Cazden et al., 1996; Moje, 2000), such as text, video, charts, graphs, and animation, each of which has a literacy (set of stereotyped processes that, when possessed, allows the learner to unlock meaning). Users may have limited to no experience in using or reading Academic English, reading various genres, interpreting data, and organizing and representing their understandings using various tools. People from communities who have lower levels of formal academic preparation or are from underserved communities are thus disadvantaged. For this reason, explicitness is needed in directions, expectations, context, and scaffolding to guide users toward successful access and use, which may involve explicitly supporting users’ comprehension through design and helping users monitor and revise their understandings. There are currently no design baseline standards that aim to provide a welcoming and supportive user environment. Opportunities, across tools and contexts, are far from uniform for users. This demonstrates a fundamental lack of commitment to the different needs of learners.

Language availability refers to both the availability of content in languages other than English and the availability of opportunities to learn and communicate with others using one’s native language and/or a new or less familiar language. Less online content is available in non-Western languages, such as Arabic or Swahili,

languages with increasing demand (Willems & Bossu, 2012). While Open Educational Resources (OER), of which the vast majority exists in MOOCs, have been created in Western industrial countries, they may not necessarily fit the needs of learners in developing countries (Richter & McPherson, 2012, p. 202). Similarly, virtual high school content, by and large, is delivered in English. In both media, non-English background users are at a disadvantage. Rankin et al. (2006) highlight an apparent shortcoming of English-centric platforms with computer-supportive collaborative games for learning. The work notes that non-native English speakers experienced far lower learning benefits than those with more English proficiency. Moreover, students who were less English proficient tended to interact with non-player characters, whereas students with more English proficiency engaged more with other human players. More recently, researchers have developed metrics to assess social behavior and interactions, particularly prosocial interactions such as turn-taking and collaboration (Emmerich & Masuch, 2016; Maitland et al., 2018). These and other efforts suggest that providing users with opportunities to use social interaction tools can not only make languages other than English available to users, but can provide context-based and more frequent opportunities for users to use L1 and L2 to communicate with others to build skills, accomplish tasks, and meet goals.

Language accessibility refers to the aim of creating design standards and principles for end-user HCI interaction, as individuals or in social interactions contexts, online, so that regardless of the platform, or technical and application scenarios (Miesenberger, Ossmann, Archambault, Searle, & Holzinger, 2008), users will be at a minimal disadvantage. Article 9 of the Convention on the Rights of Persons (Márton, Polk, & Fiala, 2013) established standards for supporting people with disabilities in physical and other contexts, reminding designers of important considerations when creating tools, platforms, and content for accessibility, emphasizing attention to text, images, forms, and sounds, and the use of assistive technologies. The guidelines remind designers that users must be able to perceive information and user interface components, and they recommend the availability of “text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.” As designers, and users, of CSCL tools and content, we must be attentive to creating design content, tools, and contexts that are accessible to all users as they seek to understand, navigate, interact with, and contribute to websites and tools.

3.2 Differentiated Learning

Recently, Rohs and Ganz (2015) applied Knowledge Gap theory to the utility and usability of MOOCs and other OER contexts. He described several ways in which these contexts serve to “reinforce or expand existing inequalities in education [rather] than help to reduce the differences” (p. 15). First, online learning contexts, like MOOCs and VHS, place relatively high demands on users to have well-formed media competence and self-regulation skills (Leven, Bilger, Strauß, & Hartmann,