

# Participatory Design for “Big Issues”: Reimagining Parent-Education Technologies in the United States Educational System

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## ABSTRACT

The growing prevalence of commercial platforms addressing the interest of the few while disregarding the needs of the many, suggests the need for Participatory Design (PD) to change approaches. It needs to help people address the big, systemic injustices that centralized platforms create. Using the case of parent-education technologies in the United States educational system, I explore the implications of such new role for PD. In particular, I follow an ecological and assets-based design approach for re-imagining parent-education technologies that support low-income, Spanish-speaking immigrant parents as they participate in their children’s education. In my previous work, I used ethnographic fieldwork to uncover all the actors, technologies, and assets present in parents’ environment. My future work will explore how to use participatory design for enabling all actors to envision new technologies that leverage existing assets. In doing so, my work contributes with new design pathways for parent-education technologies. Further, it illuminates the role of PD in changing large institutions.

## Author Keywords

participatory design, ecological, assets-based, immigrant families, large systems

## CCS Concepts

•**Human-centered computing** → **Human computer interaction (HCI)**; *Haptic devices*; User studies; Please use the 2012 Classifiers and see this link to embed them in the text: [https://dl.acm.org/ccs/ccs\\_flat.cfm](https://dl.acm.org/ccs/ccs_flat.cfm)

## INTRODUCTION AND MOTIVATION

The increasing centralization of the Internet around a handful of commercial platforms runs the risk of widening social and economic gaps [4, 25, 32]. These platforms address the interests of the few while disregarding the needs, wants, and

capacities of the many. To ensure that those least heard can take control and partake in the shaping and delivery of technological solutions, researchers and practitioners have resorted to approaches such as Participatory Design (PD) and Action Research. These not only seek for participants to identify and voice out their skills but “to ensure that the existing skills could be made a resource in the design process” [12]. However, as Bowker and Kyng argue, the focus of most present-day PD is more on facilitating users and designers to codesign for addressing “small issues” (e.g., to produce technological solutions that users like) [4]. They, thus, make a call to change PD so that it becomes a tool for people to be critical of existing power dynamics, and that, thus, profoundly change people’s practices and the systems that perpetuate these dynamics.

My dissertation research answers their call by exploring how to use PD to reimagine the role of parent-education technologies in the United States (U.S.) educational system. In particular, I center my research on the design of technologies that provide low-income Spanish-speaking, foreign-born, Hispanic immigrant parents in the city of Atlanta, U.S. with the resources to support their children’s education. Like most parents, immigrants work hard to secure a better future for their children [5]. Sociotechnical systems of education, however, favor the language, culture, knowledge, and information practices of dominant groups, complicating possibilities for less privileged groups to access resources [5, 9, 8, 13, 17, 23, 29, 32, 1].

Relying on ethnographic and participatory research methods, my work explores design for “big issues” [4] by pursuing an ecological and assets-based approach. My research is ecological in the sense that explores not only parents and the technologies they use, but all the actors involved in parents information-access, -seeking, and -processing experiences. Likewise, my research is assets-based, for it seeks to find ways for leveraging all the already existing—but often disregarded—skills, strengths, and capacities of all the actors of the ecology [16, 19]. My previous work and my proposed work will combine to illuminate the role of PD in helping these different actors to envision how to use their different (and often contrasting) assets to stitch solutions that resist existing power structures.

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## PRIOR RESEARCH

My work so far has relied on ethnographic methods to unpack the role of parent-education technologies for all the actors of the U.S. educational system. In particular, I sought to understand how the goals behind each piece of technology related to parents' ways of participating in their children's education. To tackle this challenge, my first study [32] relied on interviews with 63 parents from different socioeconomic status across the United States to reveal the online and offline interaction spaces that parents create and maintain to support their children's education. This study provided a review of existing technologies' ability to support parents' interaction spaces, revealing challenges and opportunities for new technologies that connect parents and schools. In doing so, this study contributed a richer understanding of the information and technology gaps across parents in the context of a high-income country, where race-based inequities in education have been traditionally prevalent [22].

My second study sought to expand the first by uncovering how all the actors in parents' environment relate to and transfer information about learning resources [1, 33]. Designing technology for addressing a "big issue" can be more complicated than technology designers usually take into account; a focus on one or two actors only (e.g., parents' relationship with their children, or with the school) can only lead to solutions that address immediate, and obvious needs [11]. The risk there would be to disregard systemic issues preventing long-term social change. This second study relied on a 1.5 years of ethnographic fieldwork across 12 locations in urban Atlanta with approximately 300 parents, parent-school liaisons, program administrators, and volunteers. The goal was to identify all the actors in parents' environment and their assets when it comes to supporting parents' access to information within the scope of education and beyond. This study shed light over multiple design/intervention trajectories for contending with such a large social problem. Further, it highlighted the particular issues that technology faces for changing a system that struggles with deep linguistic, cultural, and economic differences.

## PROPOSED DISSERTATION WORK

The three studies in my dissertation continue my research trajectory in exploring participatory pathways for immigrant parents and their environment to change the status quo. Each study takes an angle core to an ecological, assets-based design: 1) parents' assets-based design process, 2) the assets-based design process of school staff, supporting organizations, and software vendors based on parents' designs, and 3) an analysis of the role of PD changing a large system where institutional actors (e.g., schools) play an essential role.

### Study 1: Parents' Assets-Based Design Process

My previous research suggested potential capacities but which capacities to leverage for which design intention was still unclear. To understand parents' situated use of assets, I will engage in PD activities with 15 parents across three different locations in the city of Atlanta, U.S. With this study, I seek to understand parents' potential to change the system as well as the cultural and structural reasons that determine their use of assets. In this study, I will use participatory design as a method

for mutual learning between participant parents and myself [7]. Specifically, I will use participatory design to learn from parents' assets-based design process and parents will learn about the benefits of technology in their parenting practices.

To achieve this goal, I will design PD activities that enable the creation of a trusting third space [2, 21, 26, 30] where parents could embark in the "path of expression" [24], culminating in their ability to (1) reflect on their assets as well as everyday challenges with regards to parenting, information, and technology, and (2) imagine how to mobilize their assets and technology to attain desirable futures.

### Study 2: Designing With The Rest of the Ecology

This study's goal is for the rest of the ecology—school staff, supporting organizations, and software vendors—to envision possible sustainable, effective, assets-based points of intervention that factor in immigrant parents' assets and designs. It is these institutional actors who are aware of the regulations of the educational system and of effective ways to resist power structures within this system.

This study will entail two stages. First, I will analyze parents' assets and designs to unpack how these assets work situatedly, and the potential they have to support a technology-based intervention. From there, I will engage in a series of three (or more) participatory design workshops with 30 different ecology actors. In these workshops I will present participants with parents' assets and designs and with work with them in ideating ways for leveraging these resources in the design of technology-enhanced interventions. These sessions will aim at helping participants learn more about parents and about each others' potential for enriching information transfer in the ecology. Each session will be an iteration from the previous one with the goal of enabling participants to make sense of what previous participants have designed and shared.

### Study 3: The Role of PD in Addressing "Big Issues"

The last study will entail an analysis of the PD workshops from the previous study. The goal will be to understand the role that PD had in helping actors make sense of each other, their assets, and the ways in which these assets can be used to change the system. For this study, we will use the notion of seams and patchworking proposed by Janet Vertesi [31] to analyze PD work needed to address "big issues" [3]. Vertesi proposed the vocabulary of seams to stress that, in multi-world environments, these tend to messily overlap, leaving the seams visible at the edges. For Vertesi, it is in the study of these seams and of how people use them to solve information problems, that we can learn about how a multi-world system works. I propose to use this vocabulary for understanding those moments of connection among actors where they learned about others' assets and ideas of using them and made different decisions on how to proceed with this knowledge.

In doing so, this study will provide a much richer perspective of the possible design pathways that can lead to systemic change. More importantly, it will extend work on PD by illustrating the type of cross-world assets-based work needed for PD to address "big issues" [4].

## INFLUENCING WORK

My dissertation work draws inspiration from three different lines of work. First, there is education. Across my Ph.D. journey, which has focused on human-centered design as well as in the learning sciences, I learned about the assets-based literature in the field of education. Authors such as Kris Gutierrez [14, 15], Luis Moll [20], and Tara Yosso [34] completely shaped my perspective on how to work with communities that have been largely marginalized by mainstream society. Moll's work, for example, shed light on how we can use ethnographic fieldwork for identifying the funds of knowledge lying within families' everyday practices, and from there, start envisioning ways for using those in different forms of design [20]. Yosso's work also illuminated how educational systems often dismiss what minorities already know or do as forms of capital, for these are often non-traditional forms of capital [34]. Their work guided me through my ethnographic fieldwork as I identified different actors and the assets they mobilize to transfer information.

The second area of work that has inspired me has been studies on the role of culture in how people make decisions, and thus, in the effectiveness of interventions. The work of Betsy DiSalvo has been instrumental for my work in that regards [10]. Through PD activities she was able to identify the cultural values that could African American young males into learning Computer Science. From that understanding, she designed Glitch, a very successful intervention that led to most of her participants deciding to pursue Computer Science degrees afterwards. The work of cultural sociologists Anne Swidler has also guided my work; her theory of culture-in-action [27, 28] can serve as an analytical lens for unpacking not only people's assets but why they use them the way they do.

Finally, as my work has kept becoming more ecological, it has also become more related to Christopher LeDantec's work on making the publics [18, 6]. In his work, he examines the role of PD in helping different actors constitute publics. His work, however, describes the formation of the publics around PD for particular, small communities. In my case, I am exploring how the goal of changing an institution as big as the education system completely changes the role of PD.

## KEY CHALLENGES

As I have progressed in my research, I have found three key challenges for moving forward. The first is securing the funding necessary for conducting PD activities with parents as well as to start building prototypes for assessing the potential impact of participants' ideas in the real world. The second challenge has been to be constantly aware of the cultural work needed to work with so many different actors across time. This has impacted how I have conducted my research activities (e.g., a PD workshop for parents has completely different requirements than a PD workshop with supporting organizations) and how I present myself to participants (I have to be more formal when presenting my work to software vendors than when I talk to parents).

Further, cultural and power differences across participants have also shaped how I transfer knowledge between them: when taking parents' assets to supporting organizations, I

have to convey them as essential knowledge; when taking the prototypes that school staff create back to parents, I have to downplay the official/formal nature of those designs.

Finally, another challenge that goes with the nature of my work (tackling a "big issue") is its political nature. As I become more ingrained in the ecology, I receive more requirements from participants to intervene in aspects of their system that are very far away from technology design. Although I always want to help, sometimes I do not know how to. For example, the school staff told me that what they really need is for me to advocate for them at the school district board. This can be a hard goal to attain.

## BENEFITS FROM ATTENDING

The Participatory Design Conference is indeed the most important venue on the topic, and thus, it is one that can open many opportunities for me. Having the opportunity to attend and share my research with others who are also applying PD with different groups would greatly inform the future direction of work. Specifically, it can illuminate ideas on how to handle the differences across my many different participants and how to help them all make sense of what they are producing. I also believe that my work can make an important contribution to existing research using Participatory Design for counteracting social inequities. In particular, it can contribute to the understanding of the struggles and advantages of using PD to intervene in a systemic, big issue such as an changing parts of an education system. Further, the fact that the conference is taking place in Colombia also offers important benefits. As an Ecuadorian researcher in PD and Human-Computer Interaction, I am eager to build community with other Latin Americans pursuing similar research interests than me. This years' PDC offers the perfect venue for that purpose.

## REFERENCES

- [1] Anonymous. 2019. Details omitted for double-blind reviewing.
- [2] Homi Bhabha. 2004. The location of culture. 1994. *London and New York: Routledge* (2004), 5–6.
- [3] Susanne Bødker. 2006. When second wave HCI meets third wave challenges. In *Proceedings of the 4th Nordic conference on Human-computer interaction: changing roles*. ACM, 1–8.
- [4] Susanne Bødker and Morten Kyng. 2018. Participatory design that matters—Facing the big issues. *ACM Transactions on Computer-Human Interaction (TOCHI)* 25, 1 (2018), 4.
- [5] Gustavo Pérez Carreón, Corey Drake, and Angela Calabrese Barton. 2005. The importance of presence: Immigrant parents' school engagement experiences. *American Educational Research Journal* 42, 3 (2005), 465–498.
- [6] Christopher A Le Dantec and Carl DiSalvo. 2013. Infrastructuring and the formation of publics in participatory design. *Social Studies of Science* 43, 2 (2013), 241–264.

- [7] Betsy DiSalvo. 2016. Participatory design through a learning science lens. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM, 4459–4463.
- [8] Betsy DiSalvo, Parisa Khanipour Roshan, and Briana Morrison. 2016. Information seeking practices of parents: Exploring skills, face threats and social networks. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM, 623–634.
- [9] Betsy DiSalvo, Cecili Reid, and Parisa Khanipour Roshan. 2014. They can't find us: the search for informal CS education. In *Proceedings of the 45th ACM technical symposium on Computer science education*. ACM, 487–492.
- [10] Elizabeth Betsy DiSalvo. 2012. *Glitch game testers: the design and study of a learning environment for computational production with young African American males*. Ph.D. Dissertation. Georgia Institute of Technology.
- [11] Lynn Susan Dombrowski. 2015. *Sociotechnical Food Justice: Examining and Designing Public Interventions for Systemic Social Issues*. Ph.D. Dissertation. UC Irvine.
- [12] Pelle Ehn. 2008. Participation in design things. In *Proceedings of the tenth anniversary conference on participatory design 2008*. Indiana University, 92–101.
- [13] Michelle M Espino. 2016. The value of education and educación: Nurturing Mexican American children's educational aspirations to the doctorate. *Journal of Latinos and Education* 15, 2 (2016), 73–90.
- [14] Kris D Gutiérrez, P Zitlali Morales, and Danny C Martinez. 2009. Re-mediating literacy: Culture, difference, and learning for students from nondominant communities. *Review of research in education* 33, 1 (2009), 212–245.
- [15] Kris D Gutiérrez and Barbara Rogoff. 2003. Cultural ways of learning: Individual traits or repertoires of practice. *Educational researcher* 32, 5 (2003), 19–25.
- [16] Shaun R Harper. 2010. An anti-deficit achievement framework for research on students of color in STEM. *New Directions for Institutional Research* 2010, 148 (2010), 63–74.
- [17] Parisa Khanipour Roshan, Maia Jacobs, Michaelanne Dye, and Betsy DiSalvo. 2014. Exploring how parents in economically depressed communities access learning resources. In *Proceedings of the 18th International Conference on Supporting Group Work*. ACM, 131–141.
- [18] Christopher Le Dantec. 2012. Participation and publics: supporting community engagement. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, 1351–1360.
- [19] Alison Mathie and Gord Cunningham. 2003. From clients to citizens: Asset-based community development as a strategy for community-driven development. *Development in practice* 13, 5 (2003), 474–486.
- [20] Luis C Moll, Cathy Amanti, Deborah Neff, and Norma Gonzalez. 1992. Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory into practice* 31, 2 (1992), 132–141.
- [21] MJ Muller. Druin (2012) Participatory design: The third space of HCI. *Human-computer interaction handbook* (????).
- [22] Stanford Center on Poverty and Inequality. 2011. 20 Facts About U.S. Inequality that Everyone Should Know. (2011). <https://inequality.stanford.edu/publications/20-facts-about-us-inequality-everyone-should-know>
- [23] Jesus Ramirez-Valles and Amanda Uris Brown. 2003. Latinos' community involvement in HIV/AIDS: organizational and individual perspectives on volunteering. *AIDS Education and prevention* 15, 1 Supplement (2003), 90–104.
- [24] Elizabeth B-N Sanders and Pieter Jan Stappers. 2012. *Convivial toolbox: Generative research for the front end of design*. BIS Amsterdam.
- [25] Trebor Scholz. 2017. *Overworked and underpaid: How workers are disrupting the digital economy*. John Wiley & Sons.
- [26] Jesper Simonsen and Toni Robertson. 2012. *Routledge international handbook of participatory design*. Routledge.
- [27] Ann Swidler. 1986. Culture in action: Symbols and strategies. *American sociological review* (1986), 273–286.
- [28] Ann Swidler. 2013. *Talk of love: How culture matters*. University of Chicago Press.
- [29] Richard R Valencia. 2002. "Mexican Americans don't value education!" On the basis of the myth, mythmaking, and debunking. *Journal of Latinos and Education* 1, 2 (2002), 81–103.
- [30] Lindsay Vecchio, Karamjeet K Dhillon, and Jasmine B Ulmer. 2017. Visual methodologies for research with refugee youth. *Intercultural Education* 28, 2 (2017), 131–142.
- [31] Janet Vertesi. 2014. Seamless spaces: Heterogeneous infrastructures in interaction. *Science, Technology, & Human Values* 39, 2 (2014), 264–284.
- [32] Marisol Wong-Villacres, Upol Ehsan, Amber Solomon, Mercedes Pozo Buil, and Betsy DiSalvo. 2017. Design Guidelines for Parent-School Technologies to Support the Ecology of Parental Engagement. In *Proceedings of the 2017 Conference on Interaction Design and Children*. ACM, 73–83.
- [33] Marisol Wong-Villacres, Neha Kumar, and Betsy DiSalvo. 2019. The Work of Bilingual Parent-Education Liaisons: Assembling Information Patchworks for Immigrant Parents. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 186.

[34] Tara J Yosso\*. 2005. Whose culture has capital? A critical race theory discussion of community cultural wealth. *Race ethnicity and education* 8, 1 (2005), 69–91.