Exploring the Dynamics and Potentials of Reimagining and Engaging Intergenerational Learning

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Abstract. Intergenerational learning has been a feature of human communities since time immemorial. However, over socio-historic time we have created institutions that have shifted, disrupted, and transformed not only what is, or is not learned in intergenerational contexts but also how learning itself unfolds. This is particularly true in industrialized nation states in which mass schooling has become a central facet of childhood (e.g. Rogoff, 2003, Cole, 1998). Importantly, the disruption and transformation of intergenerational learning has not been happenstance or desired for all communities. Indeed, disrupting and preventing intergenerational learning (e.g. through family break up and child extraction) has been a key tool of domination across time. This symposium works to understand both the disruptions and reimaginings of the engagement of families and intergenerational learning dynamics with insights into the design of more effective learning environments that contribute to human thriving.

Keywords: Intergenerational Learning, Learning Across the Lifecourse, Family Engagement, Community Co-Design

Intergenerational learning

Intergenerational learning has been a feature of human communities since time immemorial. However, over socio-historic time we have created institutions that have shifted, disrupted, and transformed not only what is or is not learned in intergenerational contexts, but also how learning itself unfolds. This is particularly true in industrialized nation states in which mass schooling has become a central feature of childhood (e.g. Rogoff, 2003, Cole, 1998). Importantly the disruption and transformation of intergenerational learning has not been happenstance nor desired for all communities. Indeed disrupting and preventing intergenerational learning (e.g. through family-fracturing, child extraction, mandatory attendance policies, etc) has been a key tool of settler-colonial domination (Ishimaru et al., 2019; Fryberg & Bang 2018). Ramifications of age-segregated learning and fracturing of familial and communal organization of life and learning impact individual students self-efficacy and cultural identity (Elliot-Groves & Fryberg, 2019) as well as their academic achievement (Akee & Yazzie-Mintz 2011) and disciplinary identity development (e.g. Bell, Horne, & Cheng, 2017). These impositions also implicate longer-term challenges to community self-determination (Whyte, 2018) that can manifest in generational tensions and are visible at the micro-interactional level within homes and communities (Rogoff, Najafia, & Mejia-Arauz, 2014). The papers in

this symposium work in myriad ways to reclaim intergenerational learning as necessary to robust science education and to addressing 21st century challenges. This symposium seeks to understand both the disruptions and reimaginings of the engagement of families and intergenerational learning dynamics with insights into the design of more effective learning environments that contribute to human thriving.

Designing for intergenerational learning and partnering

Collectively, we center heterogenous familial, community, and place-based onto-epistemologies in the design of learning in and across formal and informal learning environments that seek to disrupt settler-colonial imperatives of schooling and familial (dis)engagement. Weaving together diverse conceptual perspectives within participatory design research methods (Bang & Vossoughi, 2016) and microanalysis of knowledge and interaction (diSessa, Levin, & Brown, 2016) the related papers in this symposium illuminate key insights into both design commitments necessary for intergenerational learning to unfold as well as trace hopeful possibilities and challenges for such work. In particular, we explore how our collective vision for intergenerational learning demands new sensemaking capacities, modes of partnership, and reflective practices that can reckon with contradictions and ambiguity that arise in the moment-to-moment interactions of teaching and learning. We find these moments particularly fruitful for expansive learning (Gutierréz, Baquedano-López, & Tejada, 1999).

Paper 1 explores the pedagogical and curricular supports necessary to re-making school-based educator-family relations and centering familial, land-based knowledges and practices in science learning. Paper 2 explores design possibilities for centering intergenerational familial and cultural stories in out-of-school robotics engineering and articulates a partnership model that builds facilitator sensemaking and partnering capacities. Paper 3 examines the conceptual dynamics, stories, identities, and relations within an Iranina-diaspora community designing learning environments. Paper 4 articulates reflective practices in design-work that supported educators' conceptions of- and interactions with- youth in ways that explored cultural dynamics of gender identity and the relations to both classroom practice, dynamics and identity. Woven across these papers are thoughtful and provocative re-imaginings for educational research that grapples with the "social gravity" (Erickson, 1986) of our intergenerational work and commitment to furthering social justice and community thriving.

Our session will be chaired by Megan Bang, who will provide introductory comments that locate this work in the broader literature of learning and development with respect to intergenerational learning. She will also connect this to socio-historical contexts and the work in family engagement literature. Dr. Bang will then facilitate the session. Angela Booker will serve as our discussant. Dr. Booker has substantial expertise with respect to intergenerational learning and family engagement. We will provide time at the end for a group discussion.

Paper 1: Reimagining families as central to science education

Charlene Montaño Nolan, Megan Bang, Carrie Tzou, Leah Bricker, Priya Pugh, and Jordan Sherry-Wagner

Narratives about the role and engagement of families in education has long been a subject of focus in educational research both as a way of ensuring academic achievement and addressing systemic barriers for nondominant families (e.g., Jeynes, 2005; Henderson & Mapp, 2002; Sheridan & Kim, 2015). At the same time scholarship has also demonstrated that many approaches to engage families often have deficit assumptions or assimilative demands structuring such efforts (Baquedano-López, Alexander, & Hernández, 2013; Ishimaru et al, 2018), including efforts to engage families in school-based science education (Barton et al., 2004). This paper seeks to intervene in this inequitable partnership dynamic and offers alternative modes of engagement that highlight relationality and sensemaking around the cultural nature of scientific practices and knowledges and possibilities for intergenerational learning. More specifically it explores the tools and practices in classrooms that work to center students learning in and across school, place, and family.

This paper is part of a larger project that seeks to co-design innovative research and practice with educators, families, and community based organizations that cultivates equitable, culturally based, complex socio-ecological systems learning and sustainable decision-making utilizing "field based" science education in outdoor places, including gardens, for children and their families in Kindergarten to 3rd grade. Central to this work has been efforts to re-mediate science classrooms from what we see as powered, age sequestrated and place-extracted modes of learning towards learning that centers families, communities, and places. Our project works to transform educators' understandings of and capacities to engage with children's knowledges, developed in family and community contexts, as well as to re-make their relations with families through the design of ideational and curricular materials that serve as "boundary tools" (Akkerman & Bakker, 2011; Derry et al., 2010). This work builds on the range of scholarship that demonstrates families learn science outside of school, including habits of mind, observational and explanatory practices, motivation, and identities as scientists (Marin, 2013; Tzou et al. 2019; Barton, 2001; Bell et al, 2009). Drawing from co-design data, curricular artifacts, student interviews, and

classroom implementation data across 2 years of the project, we examine the range of ideational and material tools that were co-designed and utilized in learning environments. Utilizing discourse analysis and interaction analysis (e.g., diSessa, Levin, & Brown, 2016; Cazden, 2001) data were analyzed for the ways in which learning in familial contexts and relations with families were repositioned as central to science instruction as well as the tensions and limitations of such efforts.

We illuminate two preliminary findings. First, boundary object tools helped support teachers in attending to the complexity of student and family lives. For example, during a design summit, we collectively analyzed evidence of socio-ecological reasoning from a family tool implemented during the school year that asked families to go on a nature-walk and record one observation and one "wondering". One teacher's observations of a student's drawings and wonderings about new houses being built in his neighborhood sparked a conversation about the effects of displacement, class, and racial dynamics that communities grapple with daily. This demonstrated the complexity inherent in learning across places and the necessity of navigating the realities facing communities, including refugee and immigrant families making their own relations with place amidst social and political turmoil. Secondly, we argue that (re)making relationships with places mediated subject-subject relations between schools and families. Engaging families in place-making co-design served as authentic collaboration practice that differed from traditional ways to involve families such as cleaning classrooms or fundraising.

In re-imagining family-school-teacher relations, this paper documents how justice-oriented relations to place can emerge through co-design and collective reflection around tools for boundary-spanning place-based learning.

Paper 2: TechTales: Supporting the centering of family stories in family engineering learning

Carrie Tzou, Meixi*, Elizabeth Starks, Shawn Peterson, Amanda Ramayon, Ashley Braun, Sara Marie Ortiz, Philip Bell, and Megan Bang

> *What have you learned from a plant?*
> *What patterns do you see in the plants, water, sky, animals?*
> *How might you program LEDS to illuminate your design?*

These are a few of the prompts from a family engineering guide designed by Native Girls Code, a club for Native girls ages 12-18, and who co-designed a family workbook melding land-based practices, a traditional Yakama story, and robotics. In this paper, we share resources and findings from an equity-focused family workshop that contextualizes robotics learning within family storytelling. Recent studies around engaging youth in robotics have focused on the ways in which teamwork, problem solving, understanding of STEM concepts, and identification with technology-related fields all increase as youth engage in robotics learning (c.f. Nourbakhsh et al, 2005). However, studies also point to concerns around how to broaden robotics pedagogy outside the range of normative practices acceptable within the domain (Vossoughi, Hooper, & Escudé 2016). In this project, we center robotics learning within the context of stories that families find to be meaningful in an attempt to focus on learners as cultural, historical, and political actors (Vossoughi, Hooper, & Escudé 2016). We take seriously the need to tightly interconnect learning that occurs across settings, knowing that "learning is facilitated when the cultural, socio-economic, and historical contexts of learners are recognized, respected, and responded to" (Banks et al., 2007, p. 25). By grounding our designs in story, we designed for families to have space to build culturally and personally consequential designs through shared memories, stories, and relationships with places that were explored through intergenerational perspectives and making – what we have come to call family-making (Tzou et al., 2019b). However, we also recognize that this vision of family engineering work presents challenges to facilitators who may not have experience with STEM content, intergenerational learning, or equity-focused instruction (Tzou et al., 2019a). In this paper we ask the question: *how can we support facilitators in pedagogy that centers family stories (and the multiple knowledge systems they encompass) and their intersection with robotics learning through co-design with families?*

We have articulated a set of design principles that have guided our partnership, design, and facilitation practices over the past four years. In this poster, we will describe our partnership model as well as a co-design effort with Native youth and their families to interpret and design family robotics activities around *i-i-esh,* a Yakama story. We have designed a set of materials to support the co-design process, as well as a family book that was written by the Native youth. We have also designed a set of facilitator guides and tools that help make visible the vision of family engineering learning described above.

Paper 3: Race, Parenting and identity in the Iranian diaspora: Tracing intergenerational learning and dialogue

Shirin Vossoughi

This paper analyzes the forms of dialogue, learning and collective social analysis that emerged among a group of Iranian parents/grandparents and youth who engaged in a series of design circles focused on the educational and social needs of Iranian children in the United States. As part of a national project on critical approaches to family engagement and educational self-determination among non-dominant communities, I worked closely with a group of eight parents/grandparents and two high school students to discuss their concerns and dreams with regard to young people's education and identity development as members of the Iranian diaspora.

The design circles took place in a weekend Persian language and community program in a large midwestern city. The timeline for these discussions coincided with the election of Donald Trump as president, and the subsequent "Muslim Ban"—political events that figured prominently in the dialogue that emerged. Our design work culminated in the development and shared facilitation of a larger workshop on the cultural, linguistic and racial experiences of Iranian children growing up in the U.S. for parents whose children attended the Farsi school (30 participants), and, more recently, gave life to an inter-generational storytelling project within the school.

Bringing together literature from Iranian Diaspora studies (Gholami, 2017; Shirazi, 2014), educational ethnography (Erickson, 1986; McDermott & Raley, 2009), learning sciences and participatory design research (Bang & Vossoughi, 2016), I offer an analysis of the audio-recorded dialogues, tracing the ways elders and youth narrated questions of race, identity and belonging, and how these narratives shifted over time. Though youth, particularly those from historically marginalized communities, experience specific and intensified forms of identity formation (Nasir, 2011), less attention has been given to the ongoing forms of identity formation among adults, in this case immigrant parents making sense of and negotiating their own cultural and socio-political subjectivities, often in relation to their second-generation children.

Findings emphasize the ways elders articulated educational needs, concerns, and dreams; the emergence of complex and sometimes contradictory discourses of race and racial identity as a context for learning; and the ways participants supported one another to disentangle strategies of self-defense from the politics of respectability. The complexities of elder and youth narratives call for careful attunement to the complex personhood (Tuck, 2009) of diaspora Iranians, in this case as they worked together to question and reimagine the educational and socio-political needs of the next generation. The analysis also centers the role of temporality and relationality in sowing conditions for particular stories and questions to be shared, and related implications for research on learning with families.

Paper 4: Politically- and ethically-driven reflective practice: An ideational resource for remaking intergenerational relations

Krystal Villanosa, Nikki McDaid-Morgan, Forrest Bruce, Filiberto Barajas-Lopez, Megan Bang

This paper explores the role of reflective practice as an ideational resource and tool for teaching in, and designing for, informal science environments that center relations and intergenerational learning (Dewey, 1933; Schön, 1987; Gore, 1987; Zembal-Saul, Blumenfeld, & Krajcik, 2000; Marin & Bang, 2015). There is a dearth of literature on educators' experiences using reflective practice to inform the design of both their curricula and their interaction with youth. There is also little work on the ethical and political dimensions of reflective practice (for exceptions see Gutierrez, 2017, Philips, 2011). While investigations into educators' sense-making of teaching and learning have provided some insights into how teachers differentially position youth on the basis of socially- and politically-constructed norms and identities (Nespor, 1987; Fang, 1996; Sleeter & Grant, 1999; Oakes, 2005; Jussim & Harber, 2005; Villegas, 2007; Gay, 2013), we know little about shifts in how educators and adults position youth—particularly when confronted with the ways in which their positioning of youth both open up and foreclose opportunities to learn as well as intergenerational relations and identities.

Drawing on two years of lesson plans, audio records of daily debrief meetings between ~10 educators, and video records of interactions between youth and educators during a land- and water-based STEAM summer program for urban Indigenous youth ranging from ages 6-16, we analyze how educators reflected on, positioned, and re-positioned youth in this informal science learning environment (Davies & Harré, 1990; van Langenhove & Harré, 1999; Harré & Slocum, 2003). This project deliberately engaged educators in politically- and ethically-driven reflection, with the goal of developing and enacting pedagogies centered on cultivating Indigenous presence and resurgence. One focal dimension that emerged from educators' reflective practice was around young male learners. Findings reveal that daily debrief meetings provided educators with the emotional and intellectual

space necessary to reflect on, and critically call out, the frames and narratives they were using to position Indigenous male youth. Further, the daily debrief meetings afforded opportunities for educators to develop a gender-responsive pedagogy, centering Indigenous ways of being and knowing, that worked to re-position not only male youth but also educators themselves with respect to their roles in strengthening and cultivating youths' relations to, and knowledge of, gender identity and gender expression.

Building on notions of critical reflexivity and critical attention (Ingold, 2001; Bang & Vossoughi, 2016), we put forward that routine debriefs served as a critical site for reflection where educators were able to make visible the gendered nuances of their micro-interactions with youth and (re-)design curricula/pedagogies with the goal of supporting youths' navigation of Indigenous and western discourses of gender, fostering their ability to recognize the distinction between the gender systems that exist(ed) among Indigenous peoples and colonial forms of masculinity and femininity (Morgensen, 2011 and 2015; Innes & Anderson, 2015). Importantly, these remediated gender roles and subsequent pedagogies were centered in intergenerational understandings of the ways in which gender has been impacted by colonialism and how we all may have work to do in the continued resurgence of Indigenous understandings of gender. Further these processes make visible the ways in which intergenerational learning contexts must grapple with lived and evolving historicities as central to learning not as sites of tension but insights into the complexities of the objects and relations of focus.

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