

Learning Across Settings: Towards Transformative Trajectories of Practice

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Abstract: This symposium brings together examples of movement across space, time and context to understand the details of building educational settings that allow for participants to create connections and grapple with the contradictions that arise as they move across settings. These analyses are examples of how students appropriate tools and make connections to assemble valued trajectories of learning. Moreover the cases provide insight into how researchers and practitioners can expand their focus on learning to include the connections and possible coordination across educational experiences in various contexts: school, afterschool programs, home, museums, and community spaces. A focus on cross setting learning recognizes all of these places as rich learning environments with their own histories and cultural practices. We are ultimately interested in how people make sense of and draw connections across settings in order to enhance the possibilities for equity oriented and transformative learning.

General Introduction

Learning scientists are increasingly concerned with the ecologies of learning—the distributed network of histories, locations, relationships, and artifacts—that people work with as they appropriate new tools and practices (Engeström, 1987; Nespor, 1994; Gutierrez et al, 2010; Leander, K. M., Phillips, N. C., Taylor, K. H., 2010; Rahm, 2012). Attention to learning as a distributed process that happens across settings and over time has implications for how we study learning, design expansive learning environments, and support the development of educators (Jurow, 2005; Hall, R., Wright, K. & Wieckert, K., 2007). Researchers, program designers, and teachers are positioned to attend to sense-making practices as they extend beyond the artificially bounded space-time continuum of the single setting or activity. Yet, as our attention turns to cross-setting learning, we need a multiplicity of cases and examples that help illustrate what this learning looks like in practice. Deepening our understandings of what takes hold as people move within and across settings (Street, 1995; Vossoughi & Gutierrez, in press) also demands a shift in focus from the individual and the singular environment to the multiple environments and the constellation of tools and relationships that arise in and across settings.

To this end, the proposed symposium asks: How do ideas, tools and practices travel across settings? How might fine-grained analysis of such movement help illuminate the dynamics of appropriation as a form of deep learning? More broadly: what are the methodological and pedagogical implications of attending to learning across settings? We argue throughout that tracing the appropriation of tools and practices across settings is essential for studying learning in ways that connect micro-genetic, onto-genetic and socio-cultural change (Hall, R. & Horne, L., 2012). As Rogoff (1998) argues, appropriation involves shifts in participation that contribute to and help transform the environment or practice itself. Moreover, a focus on cross-setting learning can push the field to better understand both the interdependence and potential disjuncture of identities and learning experiences across multiple locations of participation.

Designs for learning environments are informed by our understanding of what robust learning is and how it is cultivated. Accordingly, understanding how tools and practices move (or do not move) across settings offers new insights for organizing learning environments within local communities as connected to larger social, political and historical spheres of activity (Nespor, 1994; Lave, 2012). For example, supporting the kinds of learning experiences where students are actively constructing meaning and knowledge within the context of their everyday lived experiences requires researchers and practitioners alike to take seriously the multiple places and practices that students draw upon to make new ideas, dispositions, and skills meaningful. As a number of scholars have argued, the pedagogical leveraging of everyday experience is all the more pressing for youth whose home and community lives are treated as deficits to be overcome rather than resources to draw upon (Gonzalez, et. al., 2005; Gutiérrez & Rogoff, 2003). Similarly, Rahm (2012) argues that ‘while single space-based research of informal learning is important, it rarely questions the role of such learning in a larger network of practices and within a web of practices differentiated by power.’ From this vantage point, the institutional and pedagogical conditions that support learning across settings have the potential to disrupt and transform larger

social hierarchies. We argue that the learning sciences would benefit from a closer examination of how these appropriations become significant and incorporated across place.

Collectively, the three papers in this symposium will focus on learning in hybrid spaces that seek to connect practices across settings and explicitly organize for transformative possibilities. Specifically, the authors trace tools and practices as they travel and contribute to the development of hybrid spaces (Soja, 1989; Gutiérrez, 2008). Vossoughi, Escudé and Kong explore pedagogical practices that make explicit connections between after-school, home and school to encourage appropriation. Mendoza traces how pedagogical tools serve multiple functions across a social design experiment and work to create multiple layers of learning and identity and utilize contradictions as a source of learning. Shea follows graduate students through a distributed network of business school activists to see how the group appropriated tools and repurposed them in their attempts to disrupt local circumstances.

All of our papers share a methodological focus on appropriating tools across settings and a sensibility that involves asking: who gets to introduce tools within hybrid spaces? For what purposes? In his role as discussant, Manuel Espinoza (University of Colorado at Denver) will use his expertise in studying the moment-to-moment transformation of educational spaces through language, tools, and narrative to provide insight and critical feedback with regards to the development of pedagogical design and imagination. His work on “educational sanctuary” is particularly relevant to our focus on hybrid spaces.

Tinkering and Appropriation: The Pedagogical and Equity Implications of Learning Across Settings

Shirin Vossoughi, Meg Escudé, Fan Kong

This paper looks closely at the role of cross setting learning in an after-school program organized around tinkering and making. This program is partnership between a science museum and two local Boys and Girls Clubs, which work to develop and implement a sustained tinkering curriculum focused on interdisciplinary and artful forms of STEM learning. In line with the philosophies of the Boys and Girls Clubs, learning is also grounded in youth development and play. Adults, teens and children meet in a workshop setting to design and co-create artifacts such as scribbling machines, stop-motion animation films, shadow plays, wooden pinball machines and musical instruments.

From its inception, this project has been driven by equity-oriented goals. The after-school program predominantly serves immigrant and diasporic youth from communities with restricted access to educational and economic opportunities. Rather than defining equity (only) as the broadening of access to high-quality STEM education, we have been working to study the pedagogical “how” of equity in a tinkering context: the moment to moment practices that help build an inclusive, challenging and intellectually respectful learning environment for all participants (Vossoughi, et. al., 2013). In studying and defining some of the design principles that constitute equity-oriented practice, we have identified “connections across settings” as a core value.

This paper draws on ethnographic data collected over the last year and a half to examine and illustrate the multiple meanings of cross setting learning in a tinkering context (Erickson, 1986). This ethnographic data includes: field notes, audio-video recordings of both whole group and small group tinkering activity, photographs of students artifacts over time, and interviews with children, parents and educators. In particular, this presentation looks closely at moments that have been coded as illustrating cross setting learning, such as: specific moves made by educators to draw on and leverage children’s repertoires of practice (Gutiérrez & Rogoff, 2003), moments within the program when participants make connections to experiences and artifacts from home, school and other spaces outside the after-school setting, and moments when ideas, tools and practices “travel” from the tinkering setting to other contexts. In this vein, we have been studying the process of appropriation both in terms of how children draw tools/practices from other parts of their lives *into* the tinkering setting and how they draw on the tools/practices developed in the tinkering setting to approach problems encountered outside the setting in new ways, or to extend their making/tinkering practice beyond the time-space of the after-school program. We are interested in better understanding how these moments reflect and constitute deep forms of learning – i.e. what they signify in terms of children’s shifting participation in and relationship with science-rich tinkering practices (Nasir, et. al, 2006).

We argue that designing and organizing learning in ways that cultivate connections across settings supports equity-oriented goals by widening definitions of learning, intelligence and science, recognizing and leveraging children’s strengths, and drawing meaningful connections between the scientific and the everyday (Gonzalez, et. al., 2005; Vygotsky, 1986). We also address possible tensions that emerge in this work: such as the powerful role dominant definitions of “science” play in enabling or constraining cross-setting learning, and the potential disjuncture between learning in a setting that feels like “play” and carrying those experiences over into settings that feel like “school” (and vice versa). Here, we include a discussion of the kinds of reflection and openness involved - among children, educators and researchers - in allowing the settings themselves (school, home, after-school) to learn from one another. We conclude with reflections on the specific methodological

practices that help make the dynamics of cross setting learning visible, available for interpretation and useful for the continuous process of design and pedagogy (Vossoughi & Gutiérrez, in press).

Finally, in line with collaborative action research (Erickson, 2006) and social design experiments (Gutiérrez & Vossoughi, 2010), our research is deeply embedded in program design and implementation. Researchers and educators collaboratively design pedagogical environments and reflect on the kinds of shifts that emerge among participants in the after-school settings. In practice, this process of co-design involves educators serving as contributing members of the research team, and researchers participating as co-designers of curriculum and pedagogy. The director and lead educator of the After-School Tinkering Program (co-author on this paper) therefore played a central role in co-designing research questions, observational and interview protocols, codes and analyses, and serves as one of the authors on this paper.

Mediated Boundary Crossing: Traveling with Pedagogical Artifacts across Space

Elizabeth Mendoza

In an effort to address the enduring and pervasive division between theory and practice, this paper examines the way tools, or pedagogical artifacts, move across multiple settings to foster praxis, theoretical cohesion across settings and multiple layers of learning for undergraduate and graduate students. Through the documentation and analysis of a social design experiment—which seeks to create and study change and work toward praxis with an aim of promoting equitable practices for non-dominant students (Gutiérrez & Vossoughi, 2010)—this study traced tools across multiple spaces to provide insight to their potential of becoming multi-faceted.

With the notion of movement as learning (Gutiérrez, 2008), *theory* is utilized to create robust teaching and learning spaces and *practice* is used to more deeply understand theory. Of import, this praxis does not happen spontaneously or through movement alone (Engeström 2001, Engeström & Sannino, 2009). It necessitates intentionally designing pedagogical tools that move across each unique space, - a process of mediated boundary crossing.

I draw on data from El Pueblo Mágico, a social design experiment, that engages undergraduate students through pre-service teacher course, elementary students through an associated elementary school practicum site and a larger research/instructional team comprised of graduate students and faculty. For this paper, I analyze audio data from the instructional team and video and class assignments from the undergraduate course. With particular attention to the learning process of the instructional team and undergraduate students, I detail the tools utilized across spaces and analyze the shift in the role of the tool, or learning artifact, depending on the space it occupies. Specifically, I follow the weekly response to reading assignment and Cognitive Ethnographies—undergraduate practicum site field notes—through the multiple settings including: instructional team meetings, individual writing processes and whole group class discussions. By tracing pedagogical tools in this way, I demonstrate how each pedagogical tool was utilized uniquely, yet consistently, in each setting to deepen the understanding of theory and practice for all involved participants. Through the examples, I demonstrate the way common sense notions (Gramsci, 1999) of learning and teaching shift for undergraduates and deepened for graduate students. In particular, I focus on the ways these pedagogical tools work to promote reflective practices that start to highlight the ways our everyday, moment-to-moment actions are an extension of our larger societal common sense notions and the tensions that arise when these common sense notions are challenged by more robust theoretical understandings learning and teaching. The contribution of this paper is to demonstrate the way that the mediating pedagogical tools have potential to promote cohesion across learning ecologies and create multiple layers of learning across spaces.

Organizing Business for Social and Environmental Sustainability: Learning in an Emerging Field of Practice

Molly Shea

“As part of changing our activity in changing circumstances, we need to consider the most politically critical sites of political change, that is we need to make familiar and recognizable our own everyday possibilities for ‘revolutionary praxis’ and take them up in our research practices” (Lave, 2012).

A growing number of thinkers have posed a challenge to the field of education researchers to consider methodological and theoretical ways to study the processes by which persons are produced and produce themselves in historical and political terms (Drier, 2008; Holland, 2008; Lave, 2012; Rahm, 2012). I studied a group of students within a graduate school of business working to develop and re-form business expertise. In this context, students brought examples and arguments from other contexts—from conference talks to triple

bottom line businesses—to change local business curriculum and entice the broader business community to revise or reimagine business practices. Studying learning as a means of reassembling the world for imagined social futures requires attention to collective activities that draw on ideas from multiple locations to expand the vision of learning in local settings. I foreground a group of graduate students as they move across settings to better understand the work to reassemble political economies of knowledge in local settings.

There is an expanding network of young people interested in reorganizing business to account for the social and environmental affects of doing business within society. However these students enter business schools largely focused on business practices narrowly defined by generating profits in isolation from larger social issues. This multi-sited, human-centered ethnography explored how a group of business school students leveraged a larger social movement of business activists learning to reassemble knowledge and change accepted business practices in an attempt to “occupy wall street from within”. Carl, Virginia, and Emma were 3 of the 38 students from the local business school who joined an international organization, Net Impact, focused on changing the business model. They all attended the annual NI conference, engaged with NI ideas, events, and activities in the local business school setting, and co-developed a small innovation that became an organizing idea framing local activism work.

The study intentionally focused on student activity outside of formal classrooms. Rather than a more traditional study of education that privileges learning and activity in one setting, I follow students across settings as they interrogate the assumptions associated with the status quo curriculum of the classroom. The students leveraged a powerful network of reformers and activists from around the world to begin to disrupt commonly held practices within the discipline of business. By reaching beyond the local context, students appropriated new tools from distant places as a way to introduce new arguments and practices into their school. Movement across settings introduced new tools into the local context and these examples from distant places became fundamental to the collective activity of challenging a valued knowledge base and corresponding curricular norms within business. When the world and your local context does not look the way you would like it to, you have to draw on other places. Learning as “praxis” involves grasping for examples from history, aspirational speeches about the future, or other spaces to reassemble alternative visions for valued social futures. The sense making practices involved in appropriating tools as people move across place are an important mechanism for understanding learning as organizing for new forms of learning and identity trajectories. The vision of what is possible as groups struggle to assemble new ways of practicing within contentious spaces relies heavily on appropriated new tools from other places.

The study privileges movement through a network to explore how people learn to innovate in complex and contentious spaces where established practices are difficult to disrupt. The flows of material resources, ideas, and practices routed through the network comprising people, things, and ideas brought new connections into spaces to reimagine local places and practices. The network of sustainable business facilitated the movement of ideas and tools such that people could use them to question current practices in the local setting. This paper explored a small innovation that emerged through movement across space and was collectively appropriated in the local setting to reimagine business practices.

References

- Dreier, O. (1998). *Psychotherapy in Everyday Life*. Harvard University Press.
- Eisenhart, M. A., & Holland, D. C. (2001). Gender constructs and career commitments. *Women, science, and technology: A reader in feminist science studies*, 26.
- Eisenhart, M. (2001). Educational ethnography past, present, and future: Ideas to think with. *Educational Researcher*, 30(8), 16-27.
- Engeström, Y. (2001). Expansive Learning at Work: toward an activity theoretical reconceptualization. *Journal of Education and Work*, 16 (1), 133-156
- Engeström, Y., & Sannino, A. (2010). Studies of expansive learning: Foundations, findings and future challenges. *Educational Research Review*, 5(1), 1-24.
- Erickson, F. (1986). Qualitative methods in research on teaching. In M. Wittrock (Ed.), *Handbook of research on teaching* (pp. 119-161). New York, NY: Macmillan.
- Erickson, F. (2006). Studying side by side: Collaborative action ethnography in educational research. In G. Spindler & L. Hammond (Eds.), *Innovations in educational ethnography: Theory, methods and results* (pp. 235-257). Mahwah, NJ: Lawrence Erlbaum Associates.
- Freire, P. (1970/2002). *Pedagogy of the oppressed*. New York: Continuum.
- Gonzalez, N., Moll, L. C., & Amanti, C. (Eds.). (2005). *Funds of knowledge: Theorizing practices in households, communities and classrooms*. Mahwah, NJ: Erlbaum.
- Gutiérrez, K.D. (2008). *Developing a Sociocritical Literacy in the Third Space*. *Reading Research Quarterly*, 43(2).

- Gutiérrez, K. D., & Rogoff, B. (2003). Cultural ways of learning: Individual traits or repertoires of practice. *Educational Researcher*, 32(5), 19-25.
- Gutiérrez, K., & Vossoughi, S. (2010). "Lifting off the ground to return anew": Documenting and designing for equity and transformation through social design experiments, *Journal of Teacher Education*, 61(1-2), 100-117.
- Gramsci, A (1999). *Selections from the prison notebooks*. New York: International Publishers
- Hall, R., Wright, K., & Wieckert, K. (2007). Interactive and historical processes of distributing statistical concepts through work organization. *Mind, Culture, and Activity*, 14(1-2), 103-127.
- Hall, R., & Horn, I. S. (2012). Talk and Conceptual Change at Work: Adequate Representation and Epistemic Stance in a Comparative Analysis of Statistical Consulting and Teacher Workgroups. *Mind, Culture, and Activity*, 19(3), 240-258.
- Ito, M., Gutiérrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., Schor, J., Sefton-Green, J. & Watkins, S. C. (2013). *Connected learning: An agenda for research and design*. Irvine, CA: Digital Learning and Media Research Hub.
- Jurow, A.S. (2005) Shifting engagements in figured worlds: Middle school mathematics students' participation in an architectural design project. *The Journal of the Learning Sciences*, 14(1), 35-67.
- Jurow, A.S., Hall, R., & Ma, J. (2008). Expanding the disciplinary expertise of a middle school mathematics classroom: Re-contextualizing student models in conversations with visiting specialists. *The Journal of the Learning Sciences*, 17(3), 338-380.
- Lave, J., Wenger, E. (1991). *Situated learning: legitimate peripheral participation*. New York: Cambridge.
- Lave, J. (2012). Changing Practice. *Mind, Culture and Activity*, 19(2), 156-171.
- Law, J. (1992). Notes on the theory of the actor-network: ordering, strategy, and heterogeneity. *Systemic Practice and Action Research*, 5(4), 379-393
- Leander, K. M., Phillips, N. C., & Taylor, K. H. (2010). The changing social spaces of learning: Mapping new mobilities. *Review of Research in Education*, 34, 329-394.
- Nasir, N.S., Rosebery, A.S., Warren B., & Lee, C.D. (2006). Learning as a cultural process: Achieving equity through diversity. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 489-504). New York, NY: Cambridge University Press.
- Nespor, J. (1997). *Tangled Up in School: Politics, Space, Bodies, and Signs in the Educational Process*. Mahwah, NJ: Lawrence Erlbaum.
- Nespor, J. (1994). *Knowledge in Motion. Space, Time and Curriculum in Undergraduate Physics and Management*. London, Falmer Press.
- Rahm, J. (2012). Collaborative imaginaries and multi-sited ethnography: space-time dimensions of engagement in an afterschool science programme for girls. *Ethnography and Education*. 7(2), 247-264.
- Soja, E.W. (1989). *Postmodern geographies: The reassertion of space in critical social theory*. New York: Verso.
- Vossoughi, S., Escudé, M., Kong, F. & Hooper, P. (2013). Tinkering, learning and equity in the after-school setting. *FabLearn Conference Proceedings*. Stanford University.
- Vossoughi, S. & Gutiérrez, K. (In press). Studying movement, hybridity, and change: Toward a multi-sited sensibility for research on learning across contexts and borders. *NSSE Yearbook. Designing educational programs with children and youth: Alternative & flexible contexts for learning*.
- Vygotsky, L. (1986). *Thought and language*. Cambridge, MA: MIT Press.

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