# Increasing Rigor and Generativity in Learning: Connections Between the Disciplines, Children's Lived Experience and Everyday Knowledge A Symposium

Megan Bang, TERC, American Indian Center of Chicago, megan_bang@terc.edu
Christopher Wright, Tufts University
Eli Tucker-Raymond, TERC
Folashade Cromwell-Solomon, Harvard Graduate School of Education, TERC
Beth Warren, TERC

## Introduction

Improving school achievement for students from non-dominant backgrounds is increasingly requiring researchers to embrace the complexity of intersections between identity, lived experience, knowledge developed in our everyday lives, and target disciplinary knowledge and practices. The stances towards, understandings of, and engagement with the practices and knowledge children develop in their everyday life are central to engaging in this complexity (Warren et. al, 2001; Lee, 2001; Nasir et. al, 2006). Typically – although not theoretically aligned with notions of constructivist learning theories – many education researchers tend to explicitly or implicitly view children's lives and knowledge developed in everyday life from deficit perspectives that assume a lack of connection or potential alignment with expert disciplinary understandings (Warren et. al, 2001). We argue that a deeper understanding of the disciplines and the associated practices combined with an orientation towards children's practices and knowledge as resources to mobilized can increase the rigor and depth of learning environments for all children (i.e. Hudicourt-Barnes, 2003; Bang et. al, 2007).

This symposium presents three studies by junior scholars who have been trained, in part, at the Chèche Konnen Center (CKC) at TERC. CKC has been engaged in studying the ways in which children's linguistic, intellectual, and cultural strengths can be recognized and mobilized towards more rigorous science teaching and learning. These three studies expand the empirical work conducted from this perspective into new disciplinary domains. The first paper explores representational competence of elementary age Black boys as they interpret and produce architectural diagrams. The paper compares the criteria and dimensions of representations produced by the boys in the study as compared to experts. This paper expands the empirical evidence of the benefit of engaging both a disciplinary perspective as well as a resource framework into the field of engineering and design. The second paper presents a design study of a history classroom that engages students' own local histories and personal identities and works to extend these localized place based identities and narratives to global conflicts and narratives. This work demonstrates the ways in which engagement of students' identities transforms learning in the domain of history for students both by engaging them in more expert forms of historical scholarship as well as positioning them as historical actors and scholars with agency and choice.

The third paper compliments the first two presented by shifting focus from close study of student thinking to teacher thinking. The opportunity to expand learning environments by engaging disciplinary perspectives and viewing students' intellectual

strengths at any large scale will require the field to more deeply understand the ways in which to improve the capacity of teachers to more effectively teach children from communities historically placed at risk. This requires professional development opportunities in which teachers can delve more deeply into their own views about students from diverse backgrounds, themselves as cultured and raced individuals, and their understandings of the ways in which race and white privilege are embedded in the historic fibers and institutional structures within the United States (Ladson-Billings & Tate, 1995; Bell, 1992; Harris, 1993). The third paper does just this by presenting a case study of one teacher engaged in a five-year design based professional development research study focused on learning to see and teach to the intellectual strengths of students of color. The teacher in this case study learns to see the intellectual strengths of the Black boy students' in her classroom in the domain of literature and writing. This study demonstrates the ways in which structuring professional development to embrace a disciplinary (in this case a literary perspective) and resource based lens, can transform teacher practice to improve teaching and learning for students from non-dominant communities. Each paper is presented in more depth following this introduction.

Collectively these papers provide domain specific insights into teaching and learning and simultaneously demonstrate the generativity and potential benefit of deeply engaging with children's everyday experiences and knowledge as strengths and resources for designed learning environments across domains. Further, each study uses different complimentary strands of research and theory to explore these dynamics. The work in this symposium takes steps to more deeply understanding, supporting, and leveraging the ways in which diversity – of people, practices, languages, meaning, knowing, histories, goals, values, and the like…in learning environments are an asset and expand the possibilities for human knowing and meaning (Gutierrez et al. 1999; Warren, Ballenger, Ogonowski, Rosebery, and Hudicourt-Barnes, 2001).

***Structure of the Symposium***

Megan Bang, Chèche Konnen Center at TERC & American Indian Center of Chicago will serve as chair. We will open the session with a brief 5 minute introduction. We will then present the three papers, each for 15 minutes. Beth Warren, Chèche Konnen Center at TERC, will serve as the discussant. We will leave 25 minutes for questions and open discussion with the audience.

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## Paper 1: Learning to "see" sound: Meaning-making about sound through architectural diagrams among elementary school Black boys

*Christopher G. Wright, Tufts University*

This work has to primary objectives: 1) To explore the representational criteria that elementary school Black boys utilize in producing and interpreting architectural diagrams; and 2) To identify the sense-making practices that elementary school Black boys demonstrate while producing and interpreting architectural diagrams.

Using meta-representational competence (MRC) as an analytic lens has proven productive in uncovering children's representational competence (diSessa, 2004). It has been used to study how children invent new representations, critique and compare the adequacy of representations, understand the purposes of representations in particular contexts, explain representations, and learn new representations (Azevedo, 2000; diSessa, Hammer, Sherin, & Kolpakowski, 1991; diSessa & Sherin, 2000; Enyedy, 2005; Sherin, 2000).

When a MRC perspective is linked to a view of learning as cultural practice, as in the work of Warren et al. (2001), new opportunities open up for understanding the cultural, intellectual, and linguistic strengths that children from historically non-dominant communities bring to disciplinary learning. Taking this perspective on representational competence as entailing cognitive and culturally-based practices, this study focused on uncovering the knowledge and sense-making practices that Black boys used and developed as they learned to "see sound from an architectural point of view" (Lymer, 2009).

Through an ethnographic case study, I examined 4$^{th}$ grade Black boys' ideas and sense-making practices as they produced and interpreted representations of sound through architectural diagrams. Data included field notes, video footage of the boys' design and critique activities, video footage of individual interviews with the boys, and student-developed representations of sound. Data analysis involved multiple stages of coding based on Yin's (1984) classification of data according to various cross-case analyses.

### Results

The boys' representational criteria for the representations developed within architectural diagrams included *completeness* (does the representation show all relevant information), *compactness* (does the representation effectively utilize the space of the architectural diagram), and *precision* (do the representations accurately depict the various

aspects of sound). This finding agreed with diSessa's (2004) findings that suggest that kids do similar things to what professionals do and some things that differ. During the production, interpretation, and critique of sound representations, the boys were found to focus on similar aspects of sound as professional architects (White, 2004), such as sound location, sound intensity, and sound generator. The boys' representations differed from those used by architects primarily through the category of "sound type." Architects (White, 2004) utilized conventional symbols for sound, despite the type of sound, while the boys varied their symbols based on the type of the sound (i.e., notes for sounds coming from a parade, letters/words for sounds coming from children playing, and sound waves for the sounds coming from cars and airplanes).

**Significance**

This study contributes to a broadening of perspective on "what counts" as architectural and scientific knowledge and practices. By investigating the ideas and representational practices that children have, where they draw their experiences from, and how they impact learning and development in social explorations of STEM disciplines provides an in-depth picture of children's experiences and development in these areas.

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## Paper 2: History in Schools, Teachers, and Students: Identities and Meaning Making in Middle School Social Studies

Eli Tucker-Raymond, TERC; Maria Rosario, Chicago Public Schools

This paper uses qualitative data, including classroom conversations, from one self-contained, multi-ethnic, 7th grade classroom in a public school in Chicago to argue

that history, as it is taught in schools, should be aimed at helping students create and participate in democratic structures of everyday life. In doing so, we argue that school has to engage the identities of students. Furthermore, we assert that dialogic approaches to teaching and learning are well suited to accomplish this task (Wells, 1999). In supporting our argument, we describe a collaborative study that investigated the ways in which students engaged in dialogic conversations called "Socratic Seminars" (Adler, 2008).

We draw on work by Holland and Lave (2001) that conceives international, national, and institutional political and economic struggles as mediated by the struggles lived out in the everyday actions of people. That is, history lives in and is created by people, mediated by their everyday lives. For example, the local government in Chicago supports an economic model of increased attention to skilled service sector jobs; privatization of public institutions, including schools; and de-industrialization (e.g. Lipman, 2004). Concurrently, land speculation and real estate development to feed the growing service-oriented workforce has pushed westward, displacing working African American and Latino families further and further from the city center. Students in the school acutely feel the housing crunch as the school experienced a 30% mobility rate during the school year in which the study took place.

One of our goals for the overall classroom learning environment was to create spaces for students to see themselves as "historical actors" (Gutierrez, 2005) and to help them create pathways for participation in democratic life through community-based action (Barton & Levstik, 2004). We believe that for students to author themselves as historical actors, educators need to engage other aspects of students' identities, such as their place-based, racial, and ethnic notions of self. Students' actions toward becoming historical actors took many forms: exploratory conversations in Socratic Seminars, presentation of student-made masks in a "Taino" art show at a local cultural center, a "Culture Show" (dance and poetry) that focused on the African Diaspora in the Caribbean for members of the school community, and peace marches. Students also produced digital videos in which they interviewed other students, school staff, and people in the neighborhood about racism, power, and gentrification in the community. In this paper we focus on Socratic Seminars because they provide the clearest examples of the dialogic character of students' exploration of and theorizing about their relationships to history. In the full paper, we problematize the notion of identity in greater depth and its relation to dialogic constructions of self (Bakhtin, 1981).

The work was conducted through a model of collaborative action research in which the external researcher and the classroom teacher-researcher together created the curriculum, conceived of research questions, devised data collection methods, and analyzed classroom data (Nodie Oja & Smulyan, 1988). We analyzed data from Socratic Seminars, the main data source of this paper, through two iterations. First, constant comparative analysis revealed a number of recurrent themes (Glaser & Strauss, 1967). Themes included hate speech on the radio, attitudes about immigration, sexual activity and its consequences in the teenage years, borders, gentrification, and the presidential election, among others. Students also drew on a range of sources while participating in Socratic Seminar, including articles given by the teacher; horror movies; television; and experiences in the neighborhood, with family members, and at school.

Second, we selected representative examples and conducted a critical discourse analysis of the talk. Such examples have been omitted here for sake of space, but will be

presented in the longer paper. In that analysis, we sought to identify the commitments students made to identities within fields of power in local and global contexts (Fairclough, 2003). Particularly, how students mediated conversational topics on national and global scales through reference to their own local histories and personal identities, as well as how their accounts of their identities and the local history of their community were rooted in global conflicts, such as colonization and international transmigration. We further considered how conversations remade and disrupted those processes.

We found that students were able to resist and disrupt discourses of domination, such as realtors and outsiders to the neighborhood naming young people and their neighborhood as "ghetto." They also recognized parallels between international forms of colonization and the colonization of their neighborhood by "yuppies" and real estate speculators. Furthermore, students positioned themselves as agents of change, capable of resisting dominating forces at the intersection of economic, material, political and cultural "fields of power" (Bourdieu, 1991). However, we also identified tensions between disrupting and reifying dominating discourses as students confused and conflated racial and ethnic categories, as well as class and ethnicity, disassociating Black from Puerto Rican and associating White with "expensive."

Implications include an argument for dialogic approaches to Social Studies education that not only engages students in dialogue with each other, but also with the world around them, through intentional efforts to understand local contentious practices, such as struggles over gentrification and affordable housing. Dialogic approaches to teaching and learning can engage students' identities to develop rigorous, engaging, and expansive learning experiences.

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## Paper 3: A Writer's Way: One Teacher's Experience Learning to See Her Students' Intellectual Strengths

*Folashade Cromwell Solomon, Harvard Graduate School of Education, Cheche Konnen Center, TERC*

This study investigated how a teacher constructed and learned from the work of a community of practice (COP) that focuses on seeing the intellectual strengths of students of color. Looking in depth at one teacher's experience learning in such a COP, it seeks to provide an understanding of how teachers, working together to study their classroom practice can learn to see these students' strengths instead of looking through a deficit lens. Working within a practice-oriented, situated learning frame (Brown & Duguid, 1989; Lave & Wenger, 1991) I aimed to investigate the teacher's orientation toward her own learning, analyze how she engaged with the resources used to structure practice within the COP (e.g., ideas, cases, texts, classroom transcripts, other participants), and understand whether and how her participation shaped and transformed her classroom practice.

The COP studied was a voluntary collaboration between 11 teachers at an elementary school and 5 educational researchers in a small northeastern city. The collaboration was a five-year design based research study focused on learning to see and teach to the intellectual strengths of students of color. This study focused on one teacher, Maryanne, a white teacher in her mid-fifties who has taught for 18 years. Specifically, this study focused on the fourth year of the seminar and the question Maryanne brought to this COP from her classroom practice which focused on how to understand the writing of an African American boy.

My study took the form of an exploratory case study to document and understand how the teacher's participation shaped and transformed her practice, in particular her relationship with students of color, her orientation to the subject matter, and her stance toward herself as a learner?

To address this question, I conducted three in-depth interviews, each focused on one aspect of my research question. I also recorded and transcribed four full sessions of the COP, during which the teachers presented their work. Transcribing the sessions allowed me to document the teachers' experiences of the COP, both within the group meetings and as they took their learning back to their classrooms. I used a grounded approach (Strauss & Corbin, 1998) to code emerging themes as teachers described their experiences in the data group. I wrote field notes and analytic memos and developed inductive codes, which I then used to construct maps of each teacher's beliefs about learning and how she learned to change her practice (Miles & Huberman, 1994).

I found that her participation in the COP did contribute to Maryanne's work in at least three ways: her relationship to students of color, her orientation to the subject matter, and her stance toward herself as a learner. First, in her relationship, her focus on writing (the subject matter) led her to look at her student's intellect through his use of poetry and metaphor. Second, Maryanne's beliefs about teaching and learning through a disciplinary lens (in this case writing) were at the root of all of her interactions. For Maryanne, a core belief is that "You have to be a writer to teach writing." This view

allowed her to build relationships with her African American male students. She began to articulate what he could do, rather than just repeating his challenges. This learner stance also allowed her to see similarities between herself as a writer and her student as a writer. Surprisingly all these changes were possible in this COP even when she publicly, and repeatedly, expressed her skepticism of learning about race, replacing class as the explanation. However it was through her daily practices that she initiated questions regarding the relationship to writing and race. In essence it was through her writing-focused lens that she became interested in seeing race, as she started to inquire about how it played a part in his writing.

This study focuses on learning about race as a part of learning about teacher practice, and not as a separate entity. Understanding these experiences has the potential to offer more informed understanding of the ways to structure teacher learning to support continuous learning in and from practice.

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