

EXCERPT FROM:

Bright Stars: Technology-Mediated Urban Settings for High-School Aged Youth as Pathways for Engaged Learning

Cynthia Lewis and Cassandra Scharber, University of Minnesota

It was one of the classes during the day that I got excited to go to, and I don't really know how else to explain it . . . It was just kind of like, what are we going to do today, or what new thing are we gonna learn about, or what are we gonna write about? . . . With the things we do, like the blog posts or the advertisement we created, I feel [technology] gives me more opportunities to be creative within myself.

Allison (10th grade) talking about her English class

It's fun and you also get to learn new things and be able to do things you wouldn't be able to do in the outer world, I guess . . . Like a college education.

Carissa (9th grade) talking about her experiences in a summer community-based technology program

I can use what we do here in school. For example, iMovie. So, I use it here and I know how to make trailer and stuff. And, then for school, we do like, projects, iMovies and stuff. So, it's like, "I know this. I can help you guys."

Mahdi (11th grade) talking about her experiences as a mentor in a library-based technology program

These youth describe what it means to be engaged learners in three different settings, a public urban high school, an urban community-based organization (CBO), and an urban library program. If we accept Shernoff's (2013) definition of engagement as "the heightened, simultaneous experience of concentration, interest, and enjoyment in the task at hand" (p. 12), then these youth certainly fit the bill. Yet all three of the settings to which they refer serve low-income racially and ethnically diverse youth for whom disparities in educational opportunities and outcomes are typically persistent and seemingly intractable (Rowan, Hall, & Haycock, 2010). Engagement has been identified as one of the most significant predictors of learning and achievement among youth (Finn & Zimmer, 2012; Kelly, 2008; Skinner & Pitzer, 2012) and is also tied to positive youth development and decreases in negative emotions and behaviors (Christenson, Reschly, & Wylie 2012; Li, Bebiroglu, Phelps, Lerner, & Lerner, 2014). Engagement/disengagement is also recognized as a correlating factor with decisions that lead to dropping out of high school (Finn, 1989; Yazzie-Mintz, 2010). Klem and Connell (2004) estimate that 40-60% of high school students who have not dropped out are chronically disengaged, with engagement levels declining by almost 10% as youth transition to high school settings (Kelly & Price, 2014).

The first paragraph provides a clear statement of the puzzle at the heart of the proposed study and offers student engagement as a possible way to reduce inequalities in educational opportunities and outcomes.

Given these predictions and the importance of youth engagement in formal and non-formal settings, we wanted to understand more about settings that are known to effectively promote engagement in learning. Is there something about these settings that promotes the level of engagement we hear in the voices of the young people quoted here? How do particular activities, goals, and tools in each setting influence youth engagement in learning? And what do youth learn

as they engage in these activities? In 2012-2013 we conducted a funded pilot study of three high-quality settings (school, library, and CBO) that positioned youth (including those quoted here) as engaged learners through the use of digital technologies. As highlighted in the youth voices we have quoted and echoed throughout our pilot findings, youth identify the central role of digital technology in enhancing their engagement. Indeed, promising evidence indicates that opportunities to create and solve problems using technology motivates young people to engage in learning (e.g., Barron, Walter, Martin, & Schatz, 2010; Papert, 1980; Peppler, 2013).

The authors introduce a potential lever for enhancing engagement and provide support for this claim.

Our proposed study closely examines the complex features of school, library, and community-based urban settings that position youth as knowledge producers, meaning-makers, and creators of their own learning through the use of technologies. Typically, these settings function independently with little knowledge and few strategies shared across settings about how best to engage youth in learning (Erstad, Gilje, Sefton-Green, & Vasbo, 2009; Heath & McLaughlin, 1994; Sefton-Green, 2012; Shernoff, 2013; Shin & Yoshikawa, 2008). Yet, scholars of “connected” learning (Ito et al., 2013) and “pathways” for learning (Barron et al., 2010; Halpern, 2013) argue that learning develops across multiple settings, informal and formal, and both settings are in need of close examination. Our study focuses on three primary settings to examine youth engagement in learning in order to improve practices in similar settings, inform practices across settings (locally and nationally), and identify the affordances and constraints of each setting.

The second and third paragraphs provide clear statements about what the research team proposes to do and why.

Major Research Questions

How do school, library, and community-based urban settings position youth as engaged learners through the use of digital technologies? Specifically, (a) how is engagement demonstrated in each setting? (2) how do particular activities, digital technologies, and social relationships in each setting (S, L, C) influence youth engagement in learning? (c) what do youth learn in each setting as they engage in these activities, digital technologies, and social relationships? and (d) for a subset of youth participants, how does engagement in learning vary in a comparison setting?

Rationale

Connections to W.T.Grant Foundation Initiatives. This research is directly focused on investigating high quality settings that promote engagement in learning and reduce inequalities in youth development. Given persistent gaps in achievement and opportunity, there is an urgent need to understand settings that effectively make use of digital tools to promote engagement in learning for youth within urban communities. Minneapolis and St. Paul are important settings for this study given that the achievement gaps in these two cities are some the largest in the nation (Minnesota Department of Education, 2013). Further, while the state graduation rate is improving (79% in 2013), the differences between white students (85%) and their black (57%), Hispanic (58%), and American Indian (49%) peers remains dire (Minnesota Department of Education, 2013). Over 70% of youth who attend Minneapolis and Saint Paul Public Schools are from low-income households of color. It is these youth—minoritized youth from low-income households—who are participants in the settings we have chosen

The rationale clearly states why the proposed settings (i.e., the cities and public school systems) are important to the study.

for this study.

The current problem of low rates of high school retention in urban settings will not abate without focused attention to engagement in learning and on offering youth the tools they need to become digitally literate, creative, critical citizens of the world. Whereas the digital revolution and resulting divide were about access to these technological tools above all else (Warschauer, 2003; Warschauer, Knobel, & Sloane, 2004; Warschauer & Matuchniak, 2010), the current revolution is one of *participation*, where it is imperative for youth to have access to both the technology and the skills (technical and cultural) to create, evaluate, and contribute to society (Jenkins, 2009).

This section explains the focus on a particular tool (e.g., technology) and its potential to create change.

The participation gap closest to disappearing is that between whites and other racial groups, but low household income and lack of a high school education are still significant negative predictors of Internet use (Zickuhr & Smith, 2012). This broader context speaks to the need for this study of engagement in learning that has the potential to create pathways for learning across settings that serve Twin Cities' urban youth. Our research focused on settings that offer these resources to mostly low-income marginalized youth is essential to a democratic vision of access and opportunity. To further support these efforts, we established a local network of youth educators who are energized about our ongoing conversations, research, and resource sharing called the Minnesota Digital Youth Educators Network. We have already built on these strong indicators of interest and capacity and conducted a funded pilot study in 2012-2013 (described later).

The proposal indicates the particular inequalities that make the proposed study important.

A first step in establishing pathways across settings for engagement within technology-mediated learning is to examine the key features in each. Both Twin Cities' public library systems have recently enhanced their capacities to offer youth workshops for creating digital media. An increasing number of community-based organizations also are focused on digital media creation in order to offer youth access to 21st Century capacities for learning. Both Minneapolis and Saint Paul Public School districts have strong initiatives for integrating digital media creation and analysis into their curricula. This is an optimal time to study the intersection of setting, learning, and engagement in technology-mediated spaces. Ito et al., (2013), Halpern (2013), and Shernoff (2013) argue that institutions that support engaged learning must build bridges as well as cross-institutional knowledge so they can collectively better support youth. There is much to learn on local and national levels with this study, including a deeper understanding of how similar settings can better support youth and how formal and informal settings can be mutually informed, laying the ground work for coordinated, cohesive learning pathways (Halpern, 2013).

Advancing Theory and Research. Recent research has provided important findings about the learning affordances of specific digital tools and the characteristics, interests, and identities of the learners in using those tools in formal and informal settings (e.g., Black, 2008; Cohen, Kahne, Bowyer, Middaugh, & Rogowski, 2012; Gee, 2007; Hull & Katz, 2006; Ito et al., 2009). Missing from this body of work are close examinations of complex technology-mediated learning settings¹ “through the lens of equity and opportunity” (Ito et al., 2013, p. 25). Our research responds to this challenge by focusing on learning settings for minoritized youth that successfully incorporate technology as a tool within complex sets of interacting components.

To better understand this complexity and its effects on engagement in learning, Activity Theory (AT) serves as our theoretical framework. Our goal is to illuminate the dynamic and interdependent interactions among activity system features that include, for example, particular norms for interaction, divisions of labor, and forms of community ethos. Tseng and Seidman (2007) argue that research on settings for youth development would advance through a more complex vision of settings borrowed from cultural anthropologists, whose conceptual tools include observations of norms, activities, scripts for behavior and youth networks. As our methodology makes clear, these foci are similar to those used in Activity Theory, which builds on the Neo-Vygotskian work of cultural psychologists (e.g., Michael Coles, James Wertsch) and anthropologists (e.g., Barbara Rogoff, Jean Lave). Given our interest in learning within formal and non-formal settings, AT offers the added benefit of emphasizing the mediational role of signs and tools used in object- driven activities such as learning. This research is grounded in the theoretical and empirical scholarship of Activity Theory, connected learning, participatory culture, and engagement in learning.

The team introduces Activity Theory, which serves as their theoretical framework.

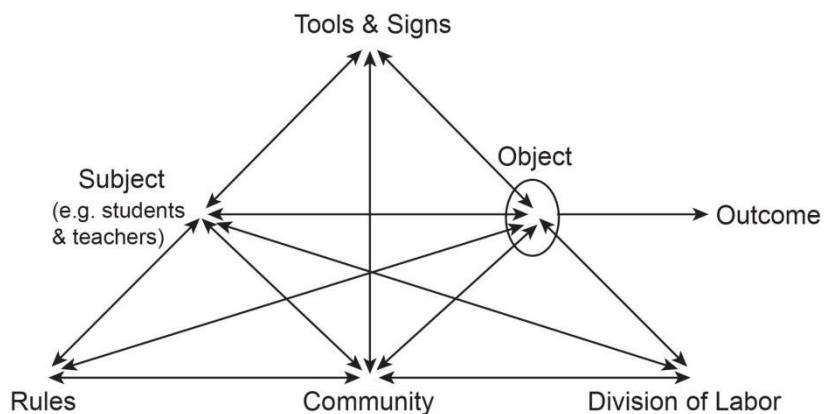
Theory and Literature Connections: Activity Theory. As a theoretical framework, AT is useful for understanding engaged learning in technology-mediated settings. Rooted in theories first developed by Vygotsky (1962) and Leont'ev (1974), AT suggests human activity is goal-oriented and mediated by symbolic and concrete tools which have particular social, cultural, and historical uses within the system (Engeström, 1999). In our research, youth are purposeful actors creating meaning with tools to meet goals within a system. Furthermore, our theoretical framework views learning not as primarily an individual mental act but as a social act dependent upon interaction among people and their tools and technologies (Rogoff, 1995; Wenger, 1998). In our research, the idea of learning as transformation through collective use of technology within social learning settings is central.

This section defines and describes the framework as it relates to the proposed project and the key themes of engagement and learning.

AT holds that individuals are indivisible from their contexts. Social settings shape the individuals who are situated within them and vice-versa. The activity that occurs within social settings “does not only transform the object, but also the participant and its mediated relations” (Cole & Engeström, 1993). This framework expands the unit of analysis to the activity within settings rather than the individual. Activity systems are not discrete, but rather intersect with other activity systems resulting in a framework for understanding settings and their effects on human action as a complex and dynamic interaction. In our study, the primary activity settings to be examined are our observations sites; however, as explained in our section on methodology, we will give secondary consideration to how each setting is shaped by its institutional context, both in terms of affordances and constraints related to engagement in learning with digital media.

¹ Using the phrase “technology---mediated” rather than “technology---integrated” is consistent with our focus on Activity Theory. Central to AT is the analysis of cultural tools that mediate between human action and institutional/historical/cultural settings (Wertsch, 1995). Thus, the concept of mediation is critical to our understanding of the role of technology in formal and non---formal settings for youth. We are interested in how technology as a cultural tool functions in activity settings that involve youth as central creators of their own learning. We want to better understand the affordances of the tool that link the youth to the setting and its goals and learning objectives. We use the terms “digital media” and “digital technology” depending on the term used by our participants and by the scholars we cite.

Activity systems evolve through dialectical contradictions within the system. The types of contradictions that drive the evolution of activity systems are important dimensions of analysis, as fully explained in the data analysis section of this proposal.



The diagram provides reviewers with a useful visual aid. This is a good use of space.

Figure 1: Illustration of Activity Theory (Engeström, 1999).

Within an AT framework, youth are purposeful actors who bring their own histories and cultural repertoires to collective activity, creating meaning with tools to meet goals within a socially and culturally meaningful system (Gutiérrez & Rogoff, 2003). The elements of activity systems delineated in our research questions interact in ways that must be understood in order to arrive at a nuanced understanding of engagement as a dynamic process with links to learning and participation. The section on data analysis delineates our method of analysis (and explains the components of the triangle that make up the activity system). Activity System Analysis (ASA) is the methodology aligned with an AT framework (Yamagata-Lynch, 2010).

The narrative consistently situates the discussion of prior work around Activity Theory and then relates it back to the proposed project.

Theory and Literature Connections: Connected Learning and Participatory Culture. The increasing emphasis on “transforming education” using technology-infused learning in national policy initiatives (e.g., USDOE, 2010; H.R. 521, 2013) underscores the importance of moving beyond nascent knowledge of technology skill acquisition to what some scholars are calling “connected learning” (Ito et al., 2013). Connected learning focuses on learning “pathways” that move across formal and informal settings to transform the very nature of learning – what it means, how it occurs, and where it takes place (Barron et al., 2010; Hobbs & Frost, 2003; Jenkins, 2009; Peppler, 2013). Such learning has been described as interactive, improvisational, participatory, and social (Jenkins, 2009), reflecting new epistemologies and pedagogies for learning that occur in flexible settings with learning extending beyond school. Knobel and Lankshear (2007) argue that new literacies have led to new social practices related to producing, representing, and consuming knowledge. Skills associated with “participatory culture” include such skills as “transmedia navigation” which involves “the ability to follow the flow of stories and information across multiple modalities” and “distributed cognition,” which involves the ability “to interact meaningfully with tools that expand mental capacity” (Jenkins, 2009, p. 4).

The research team develops a link between learning and engagement, and motivates the types of settings and experiences that will be studied.

Focusing on schools alone to develop these capacities is not the answer; instead, pathways for learning must be established in and across multiple settings (Halpern, 2013). Because youth often participate in new media culture independently, outside of any formal learning setting, Jenkins (2009) states that some educators feel that “youths can simply acquire these skills [media literacies] on their own without adult intervention or supervision” (p. 15). However, Jenkins argues that without adult intervention, three core issues of new media culture will not be addressed:

1. *The Participation Gap*: access to skills, opportunities, experiences and knowledge for full participation;
2. *The Transparency Problem*: challenges that youth face learning to critically evaluate the media they consume as well as create, and how media shape perceptions of the world;
3. *Ethics Challenge*: the breakdown of traditional forms of professional training and socialization that might prepare youth for their increasingly public roles as media makers and community participants.

The sites we propose to study address these core issues, which are important for youth as creators and as consumers of digital media. Our own research has shown the power of

participatory culture in an urban high school program focused on critical literacy and academic rigor through digital media studies. We found that students were engaged in learning when they had a chance to produce rather than merely analyze digital media, circulate their work for a range of audiences, use their work to represent their identities, and take up agentive stances to comment on injustice and effect change (e.g., Lewis & Causey, in press; Lewis, Doerr-Stevens, Dockter-Tierney, & Scharber, 2012).

Participatory culture is viewed as the basis for contemporary learning, civic engagement, and communication (Delwiche & Henderson, 2012; Kafai & Peppler, 2011; Rheingold, 2012; Soep, 2014). Low-income youth lag behind more well-resourced youth who regularly create digital content to participate in local and global meaning-making and communication. Because our research seeks to better understand what *is* working rather than what has not been effective in addressing this “participation gap” (Jenkins, 2009), our focus is on urban settings that provide regular opportunities for youth to use technology and that engage them in participatory culture. In their research on the factors that most influence eighth-grade students’ uses of technological tools for empowering and generative purpose, Barron et al. (2010) point out that although access to technology tools is important, “we need to attend to the broader learning ecologies that students access and develop, and find ways to make these more diverse, generative, and interconnected” (p. 188). However, before creating effective pathways across settings, we must fully understand how to create effective learning ecologies within settings where youth typically participate in technology-mediated learning. Our goal is provide a detailed account of such settings and their affordances and constraints in creating learning ecologies that engage youth.

The research team identifies limitations and gaps in the existing body of research evidence.

The team explicitly states how the proposed work will address gaps in the literature and extend prior research. The team also signals a shift in focus. They are moving from understanding what the problems are to identifying ways to address them. In proposals on reducing inequality, the narrative should include more information about how the research will shed light on ways to respond to these challenges.

Theory and Literature Connections: Engagement and Learning. Engagement can be conceptualized as “the experience of simultaneous, heightened concentration, enjoyment, and interest” (Shernoff, 2013, pg. 12). All three of these elements are strongly related to learning (Shernoff & Csikszentmihalyi, 2009), with engagement increasing when youths’ passions, participation, and accomplishments are cultivated (Benson & Scales, 2007). This conceptualization of engagement is also referred to as “vital engagement” (Nakamura, 2001), “spark” (Benson & Scales, 2007), and “flow” (Csikszentmihalyi, 1990). Scholars working in the area of “connected learning” (already discussed) have built on these insights into engagement to emphasize the importance of what has been termed “interest-driven” learning (Ito et al., 2013; Peppler, 2013).

Sustaining the engaged learning these scholars describe requires conditions that support engagement. Recent scholarship on engagement advocates for a systems-oriented construct of engagement as the nexus linking young people’s agency to their social worlds and institutional culture of their school or other learning setting (Lawson & Lawson, 2013). Based on their meta-analysis of research on school engagement, Fredricks, Blumenfeld, and Paris (2004) conclude that research investigating the multidimensionality of engagement is needed in order to consider the dynamic interplay of the behavioral, emotional, and cognitive aspects of engagement. Bartko (2005) endorses the multidimensional nature of engagement and notes that the behavioral, emotional and cognitive dimensions may be equally, or even more, applicable for outside-of-school settings than school settings. Behavioral engagement is indicated through participatory involvement in activities (i.e., attendance, attention, preparation). Emotional engagement is indicated by a positive or negative attitude toward the setting (people and tasks) and a sense of belonging. Cognitive engagement is indicated by involvement and persistence related to tasks, such as task completion, and efforts to master skills as well as comprehending complex ideas. Fredricks (2011) calls for research that investigates the multidimensional view of engagement and examines influences that include characteristics of facilitators, peers, structures, and tasks. This proposed study answers this call through measures of all dimensions and by focusing on engagement through the sociocultural lens of Activity Theory.

This entire section provides an in-depth discussion of the literature on engagement and learning. The team clearly defines key terms and grounds the discussion in the framework (i.e., Activity Theory). This thoughtful presentation helps reviewers anticipate the study's likely theoretical contributions.

Complementing our multidimensional construct of engagement framework is our theoretical framework of learning that builds on Vygotsky (1935/1978) to situate learning not as primarily an individual mental act but as a social act dependent upon interaction among people and their tools and technologies (Engeström & Sannino, 2010; Lave, 1996; Rogoff, 1995; Wenger, 1998). Scholarship on learning as a social practice has many strands, and reviewing the distinctions among them is beyond the scope of this review of literature. However, scholarship that emphasizes participation in communities is especially relevant to our project and, thus, will be briefly summarized. For both Rogoff (1995) and Lave (1996), participation starts with high levels of scaffolding that are gradually released as learners take on more legitimacy and responsibility. Rogoff calls this process “participatory appropriation” (1995, p. 151), which defines learning as the process by which individuals make meaning of activities in communities and, through their participation, ultimately transform the self as well as the setting. This transformation of self can be viewed as developing a learning identity (Wortham, 2004) and integrally connects learning to social interaction (Lewis & Ketter, 2011). Based on her research on learning communities outside of schools, Lave argues that learning is about constructing

“identities in practice” (1996, p. 157). Wenger (1998) also views learning as arising from the identity work that occurs through participation in communities of practice, communities “created over time by the sustained pursuit of a shared enterprise” (p. 45). Participation in such communities is always a work in progress shaped by individual and collective efforts to create coherence through participation in varied social contexts. Related specifically to the scholarship on “communities of practice” (Lave & Wenger, 1991; Wenger 1998), Barton and Hamilton (2005) argue that this work does not sufficiently examine the mediating nature of language in learning. However, as Wells (1996) and Moje and Lewis (2007) have pointed out, AT is conducive to an examination of language use because it addresses norms of interaction as part of its emphasis on sign/tool use (language being a central ‘sign’ in the formation of community), a concept more fully developed in the methodology section of this proposal.

Renowned AT scholars, Engeström and Sannino (2010) have developed a conceptual model of learning—different from both the acquisition and participation models—called “expansive learning.” Expansive learning involves learners constructing concepts or objects through collective activity that then moves the collectivity toward transformation. In this way, settings are transformed by learners, just as learners are transformed by their social settings. The concept of learning as transformation is further elucidated by Stetsenko (2008) who contends that “the collaborative purposeful transformation of the world is the principled grounding for learning and development” (p. 471). In our research, this idea of mutual change through collective use of digital technology within social settings is central and aligned with our pilot study findings as described in the next section. As participant-observers in the settings we study we want to understand learning, as Vadeboncoeur (2006) suggests, not as a predetermined set of principles, but as it is defined by what counts as learning within each setting. To answer our third research question about what students learn, we will first determine what counts as learning within setting.

Pilot Study: Hypotheses and Findings. In 2012-2013, we conducted a funded pilot study of one site in each of three settings (S, L, C). This pilot helped us to refine our design, hone instruments, test hypotheses, and formulate preliminary findings (Scharber, Lewis, Isaacson, & Pyscher, 2014), all of which have informed this proposed study. For example, in addressing our second research question about particular aspects of the activity system that promote engagement, we hypothesized that the role of the facilitator would be central in making these systems “high quality,” but we wanted to learn more about *how* this happened as well as to explore the relationship between the facilitator (“subject”) and the “object” (problem space/purpose). Activity System Analysis (fully described in the section on methodology) helped illuminate that while the objects were different for each setting (e.g., developing expertise through mentorship (library), social justice/social critique (school), and community exploration with media skills (community-based organization)), the objects were collectively taken up by all social actors within each system. The settings shared the same assumptions about the nature of learning (e.g., learning is creation-centric, goal-driven, socially-embedded, peer/team orientated) and these assumptions co-occurred with youth engagement in the overarching object of each activity system.

The research team strengthens their case for the current work with evidence from a pilot study.

In their work on game-based learning, Barab, Gresalfi, and Ingram-Goble (2010, p. 526) describe three core elements of transformational play, which they equate with deep learning: “person with intentionality” (social actors have agency to act and transform signs and relationships) “content

with legitimacy" (conceptual/technical constructs are needed in order to solve problems) and "context with consequentiality" (social actors can modify contexts in ways that lead to new purposes and outcomes). These three elements of transformational play were present in all of our pilot settings. In all three settings, youth had multiple opportunities to make decisions, develop relationships, and transform signs – e.g. analyzing media in new ways to understand racism and producing media to interrupt racism. In all three, the problems posed required skills or academic content to complete, and in all three, the setting was modified by participants, thus leading to new purposes and outcomes. For example in the school setting, a student used a forbidden smartphone to provide the class with information about ethical relief organizations related to a book the students had read about Hurricane Katrina.

The facilitators played a crucial role in communicating, modeling, and reaffirming assumptions about learning that included these core elements of play/deep learning, and were expert at making the object/problem space compelling enough for deep investment from youth participants. The "bright star" element across these settings is that the object was not dictated but rather facilitators invited and expected youth to take up and transform the object, share in decision making and participation (e.g., equitable division of labor), and bring their own related purposes to bear. Moreover, although we had speculated that deep engagement might not hold in the classroom setting due to mandatory attendance, this did not emerge as a finding. Instead, youth were highly engaged in the classroom we studied with digital media creation as a central feature of an activity system that included extensive opportunities for connections related both to the students' identities and to the institutional community to which they belonged.

Contradictions between/among activity components drive change within the system or between intersecting systems. In our pilot study, for example, the larger library activity system had an impact on the sense of belonging present among the teen team members who facilitated weekly drop-in technology workshops for other teens. This team operated within in a small library setting within a high poverty area. The team lacked a designated space in the library to prepare for and conduct their workshops, as there were scheduling overlaps (in time and space) with an after-school homework help program. These realities caused the program facilitator to worry about what she perceive as the lack of value placed on the program. She also was concerned that the teen team would lack a sense of worth, that they would feel undervalued. She preferred the main library branch in another part of the city, which is a modern, newly designed space—where she occasionally met with the teen team to plan for their workshops with neighborhood youth back in their home library. However, the interviews with the teen team told a different story. The teen team actually preferred the small, cramped library in their neighborhood and felt connected to a larger purpose when in that space. Some youth talked about feeling very comfortable no matter how small or undesignated their program space. Instead, they saw themselves as representatives of the neighborhood library as a whole—not just the teen technology team. As researchers, then, it became even more important to understand how community norms were effectively co-constructed among the participants in this program and related to the larger institution, and AT helped us do this through understanding more about the social actors (teen tech team) in terms of their social and cultural histories and ties to the neighborhood.

The research team provided enough detail for reviewers to understand the programs, how they operate, the role of facilitators, and what youth did.

The description of the pilot study provides the questions motivating the work, explains what the pilot study allowed the researchers to do, (e.g., hone instruments and test hypotheses), and lays out how the pilot work will inform the proposed study.

Language proved to have a powerful, shaping influence on the formation of community norms and the establishment of trust in each of our pilot settings. In general, the language use in all settings was dialogic (Nystrand, Wu, Gamoran, Zeiser, & Long, 2003), characterized by student-generated questions, seamless weaving of formal and informal language, official and unofficial knowledge, “new” (digital media) and “old” (print texts) technologies, and animated sharing of multiple perspectives that continually referenced previous speakers, class texts, and media sources. This intertextuality (Bakhtin, 1986)—uses of language that are steeped in others’ words, ideas, and texts—was central to the dynamic process of establishing a learning community in each setting. Of course, even in optimum settings, communities have conflict and must negotiate the politics of participation that stem from unequal power relations and competing social and cultural histories (Lewis, Enciso, & Moje, 2007; Linehan & McCarthy, 2001). In our observations of the pilot school classroom, for example, early discussions proved to be dominated by white male students despite the fact that the majority of students in the class were African American, African, and Latino/a. From an activity theory perspective, however, this contradiction between nodes (social actors, community, and division of labor) drove change in that the form of dialogue led to new participation structures. All five of our focal students in this setting spoke to the importance of dialogue about difficult issues and their sense of trust in the community; and, although different issues arose, the role of language was very important to understanding engagement in learning within this classroom as well as in all three pilot settings. As already mentioned, several scholars have found that the scholarship on communities of practice does not adequately account for the role of language in learning and identity development. Although our pilot study did not include detailed discourse analysis, our methodology section proposes targeted uses of this method as an important addition to our proposed study.

When appropriate, the description links the pilot work back to theory.

These findings provide promising threads to pursue in a more robust study of these high-quality settings. Due to funding constraints, our pilot study did not include the engagement surveys, engagement protocol, and other quantitative measures that will lead to richer analyses and more comprehensive findings in the proposed study. What makes these settings work well? These deep examinations of technology-mediated learning settings will inform both within and cross-setting knowledge, fuel potential collaborations, and enable us to better support urban youth. In their report on connected learning, Ito et. al. (2013) assert that without “a proactive reform agenda that begins with questions of equity, leverages both in-school and out-of-school learning, and embraces the opportunities new media offer for learning, we risk a growth in educational alienation by our most vulnerable populations” (p. 7). In closely examining settings that work well to engage youth in learning, we hope our research will provide a roadmap for such reforms.

The research team describes what the pilot study did not do, and sets up the proposed study.

Research Questions

How do school, library, and community-based urban settings position youth as engaged learners through the use of digital technologies?

The research questions are clearly defined and well situated from the prior discussion of theoretical context.

How do school, library, and community-based urban settings position youth as engaged learners through the use of digital technologies?

1. How is engagement demonstrated in each setting?
What are the expectations for engagement in each setting? How is engagement (cognitive, emotional, behavioral, sociocultural) evident? How are the expectations for engagement similar and varied across settings?
2. How do particular activities, digital technologies, and social relationships in each setting (S, L, C) influence youth engagement in learning?
How does each setting function as an activity system with digital technology as a central tool in object-driven activity? What do the activity systems have in common? How do the activity systems differ? How is each activity system shaped by its larger institutional context? How is engagement tied to individual and interdependent components of the activity system?
3. What do youth learn in each setting as they engage in these activities, digital technologies, and social relationships?
What assumptions about learning are evident in each setting? What expectations about learning are evident in each setting? What learning goals are explicit or assumed in each setting? How are these aspects of learning similar and varied across settings? What do youth learn in each setting?
4. For a subset of youth participants, how does engagement in learning vary in a comparison setting?
How is the comparison setting similar or different than the primary study setting in which the youth participates? How is the youth participant's engagement (cognitive emotional, behavioral, or sociocultural) evident in the comparison setting?

Research Methods

Overview. This two-year study (2015 & 2016) employs a mixed-methods embedded multi-case study design (Merriam, 2009) that includes both qualitative and quantitative measures of youth engagement in learning across formal and non-formal settings (see Appendix A, Figure 2). A funded pilot study was completed during 2012-2013. This pilot study enabled the research team to identify and coordinate appropriate research sites across the Twin Cities, test and select data collection instruments, and hone data collection and analysis strategies. We received IRB approval for the pilot and this proposed study in September 2012 (Assurance of Compliance Number: FWA00000312; IRB Number: 1209S19944) (see Appendix B).

Settings and Participants. The proposed study will focus on nine formal and non-formal learning sites within the Twin Cities where high-school aged youth (ages 14-18) actively use and create

with digital media through consistent and sustained access to technology. The focus is on school classrooms, library programs, and community based organizations because these are the three primary settings with clear boundaries where youth have opportunities to create and learn through the use of digital media. After-school programs were considered as an additional setting. However, we decided against adding this setting due to the characterization of after-school settings as frequently adopting school-based expectations and priorities (Sefton-Green, 2012; Vadeboncoeur, 2006), thus potentially blurring distinctions between settings and complicating data analysis.

Over the two-year duration of the study, three school classrooms (S1, S2, S3), three public library programs (L1, L2, L3), and three community-based organizations (C1, C2, C3) will serve as study sites. Library sites will include both open lab and focused workshop sites so that we can learn more about how different activity settings affect engagement in learning within the same institution. School sites will include high school English/Language Arts (ELA) classrooms. Limiting the focus to ELA classrooms is best suited to this study because the core standards for ELA include media literacy (21st century) standards that include both media production and analysis. Moreover, ELA classrooms tend to emphasize processes (e.g. writing/speaking/creating) over content, thus offering more opportunity for youth creation of digital media. Community-based organizations that highlight digital media creation in their informational documents will be selected so that researchers can count on extended durations for data collection that match the data collection periods (in duration rather than calendar schedules) for the library and school settings.

Participants will include youth and facilitators at each site. All youth and facilitators at each site will be recruited for participation in the study. Five to seven focal students will be identified at each site (9 sites) for individual interviews and more focused observations. In addition, two mini-case youth will be recruited from each setting (6 youth total; 2 S, 2L, 2C) to gather more information about their engagement in learning within another context outside of the primary setting (S, L, C) where we first encounter them.

Our collaboration with colleagues from the Center for Youth Development at the University of Minnesota confirmed our sense that communication, locally and nationally, across the three settings we wish to study has been rare. Together, in 2011, we formed a network of Twin Cities' youth workers and teachers with interests and experience in working with youth in technology-mediated settings (<http://lt.umn.edu/blog/updates/1081>). Network participants confirmed the lack of communication across settings, and expressed strong enthusiasm for developing resources and sharing knowledge to open new pathways for learning among youth. In response, we worked together to sponsor a well-attended symposium on digital media learning headlined by Dr. Nichole Pinkard (Co-Founder of the Digital Youth Network) that was attended by youth workers, media specialists, and teachers from across as well outside of the Twin Cities (<http://lt.umn.edu/blog/updates/1114>). We just hosted our second symposium for this network focused on youth production in digital-age civics in February 2014 featuring Dr. Elisabeth Soep (Senior Producer and Research Associate at Youth Radio) (<http://lt.umn.edu/blog/updates/446123>). We continue to be committed to conducting this research locally not only because the need is strong as discussed in our rationale, but also so that we can continue our work with local stakeholders, share findings, and collaborate together to offer Twin Cities' youth enhanced

opportunities to take up and design their own learning through digital media creation *within and across* multiple settings/institutions (Halpern, 2013; Ito et al., 2013). This focus on changing practice will also inform our work on local, state, and national advisory boards that inform policy.

Site Selection. We used criterion sampling (Patton, 2001) to identify case sites in our three setting categories. In order to select high-quality technology-mediated sites, we turned to criteria that are grounded in both practice and theory. Our pilot study aided in the selection of appropriate research sites. These practice-driven criteria are guiding our inclusion and selection of research sites:

- Youth actively use and create with digital media;
- Youth have consistent and sustained access to technology;
- Digital media production plays a central role in the learning processes;
- Recognition by external community or other entities as having quality programs (grants, awards).

The research team adopted a systematic approach to site selection.

In addition to being driven by practice-based criteria, our selection of research sites is also driven by theoretically-based criteria. Research sites must also meet three out of Jenkins' (2009) five criteria for encouraging "participatory culture:" (1) with relatively low barriers to artistic expression and civic engagement; (2) with strong support for creating and sharing one's creations with others; (3) with some type of informal mentorship whereby what is known by the most experienced is passed along to novices; (4) where members believe that their contributions matter; (5) where members feel some degree of social connection with one another. Specifically, we are interested in *how* strong sites that have these features of participatory culture engage youth in learning, and also in understanding the nuances within the complex nature of the "object" (problem space) of activity systems and how the object is fostered. Our research aims to understand how different settings (different activity systems) support *engaged learning*, an aim which extends the concept of "participatory culture" and links it to engagement and learning.

We have used a combination of strategies to identify sites that meet our selection criteria: (a) sites that received external grants (e.g. the large grants from funding agencies that were awarded to both library systems to support the development of teen technology spaces); (b) principal and co-principal investigators' experiences in other professional capacities that have resulted in a depth of knowledge about sites in each setting category (e.g. previous research conducted in a teacher's classroom that provided knowledge about her consistent and sustained use of technology); and (c) ongoing discussions with the local network of youth workers, media specialists, and teachers whose work with youth involves digital media content creation; and (d) site demographics such as high numbers of students on "free and reduced lunch" (indicating low income) in the case of the urban schools we selected and, in all sites, youth from non-dominant, minoritized groups.

The narrative delineates the theoretical criteria driving the site selection strategy and the steps the team taken in the field to try and meet them.

Three sites were included in our pilot study: one school classroom, one library, and one community-based organization. To date, six of the nine sites have been identified for inclusion in this larger study, including "Teen Tech" programs within both of the largest library systems in

the Twin Cities (*Hennepin County Library*: <http://www.hclib.org/pub/>, *St. Paul Public Library*: <http://www.sppl.org>), two high school ELA classrooms, and two community-based organizations that serve urban youth (*St. Paul Learning Network*: <http://spnn.org/youth> and *Intermedia Arts*: <http://intermediaarts.org>). Analysis and findings from our pilot study (Scharber, Lewis, Isaacson, & Pyscher, 2014) are guiding us in our selection of remaining sites based on a combination of the selection criteria already delineated and on our wish to select a range of sites that vary based on such factors as demographics and sources of funding.

Design and Data Collection Methods. We will employ a mixed-methods multi-case study design (Merriam, 2009), which will allow us to study several sub-units/cases (different sites) within each setting (case). We will utilize both qualitative and quantitative methods to study school (S), library (L), and community-based learning settings (C) over the course of two years. A mixed-methods design allows us to (a) take advantage of the strengths of qualitative research and the strengths of quantitative research, (b) compensate for the limitations of each method, and (c) triangulate our findings (Denzin, 2012; Patton, 2001). We will collect the qualitative and quantitative data in the same time frame and mix the data *within each site* throughout data collection, analysis, and interpretation—an integrated mixed-methods approach (Jang, McDougall, Pollon, Herbert, & Russell, 2008). The qualitative data will have priority during integration because we are using Activity Theory as the overall theoretical frame for the study. Activity Theory assumes that participants and settings are indivisible and co-evolve through interaction of different components of activity and this assumption is consistent with a qualitative research approach.

Each site will be examined in depth over the course of an academic school year for classrooms settings, or program duration and/or the carrying out of a specific project – from conception to completion – for library and community-based programs (e.g., **Y1:** S1, S2, L1, L2, C1; **Y2:** S3, L3, C2, C3). Our mixed methods design incorporates qualitative and quantitative measures of engagement and learning as well as detailed observation and analysis of each setting. Multiple sites within a case, multiple data sources, mixed-methods, and a team of researchers enable triangulation (Denzin, 1978, 2012) of our interpretations, thereby ensuring the validity and credibility of our findings, and adding depth to our case descriptions. We have strategically aligned our data, tools, and methods with our research questions (see Appendix C, Table 1) and created a data collection timeline for each measure within each setting (see Appendix C, Table 2). Intensive qualitative observations of each site combined with quantitative data will allow us to generate robust case descriptions for each setting as well as discern common and varying features across learning settings. In the following paragraphs, we describe in more detail our data collection measures/tools and methods.

Observations: Observations are our primary data source and will provide insights into the features of the activity system in each setting, as well as learning and engagement in each setting. Three methods will be used to collect data during observations: Qualitative fieldnotes and two separate formal protocols. The two formal protocols are an Activity System Observation Protocol (ASOP) and the Youth Program Quality Assessment (YPQA) (Smith & Hohmann, 2005) which will be analyzed using mixed methods.

During each site visit, researchers in the role of participant-observer will take

The data collection plan is clearly specified.

Information is provided about what will be noted and interpreted, as well as the two observational protocols that will structure data collection.

fieldnotes that focus primarily on description with some supplementary interpretive comments. Descriptive notes will include description of the activity and physical setting, accounts of students' behaviors, and reconstruction of dialogue. Interpretive notes, noted in italics, will include impressions and speculations related to observations (e.g. a speculation that a participant's visible change in behavior is related to an immediate change in the activity system/setting). Regular audio and pictorial and occasional short video-recordings of discussions and activities will supplement field notes and allow us to analyze the dynamics of discourse as well as nonverbal interaction.

The *Activity System Observation Protocol* (ASOP, see Appendix D) is our most important observational data source. We have developed and successfully piloted the ASOP to provide a detailed account of the components of a learning activity as enacted in a given session or class period. The ASOP directly connects to the study's research questions. Researchers will first complete fieldnotes for each observation and then select activities for further analysis using the ASOP multiple times per setting. Each ASOP will focus on one activity that the researcher finds particularly salient in answering our research questions. (The ASOP also has been successfully piloted in several research seminars at the University of Minnesota.)

The research team provides a well-developed observational protocol.

The *YPQA* is a formal observation protocol that measures instructional process best practices in a range of settings, including community organizations and schools. The YPQA has been validated in both formal and non-formal settings (Smith & Hohmann, 2005). We will use YPQA Form A: Program Offerings to collect quantitative data on three system features—safe environment, supportive environment, and interaction—and student engagement. Researchers will complete the YPQA 2 times *per month* for school sites, school-year library programs and programs at community-based organizations that are of a month or longer duration. We will also complete the YPQA at least 2 times for 6-week library programs and short-term programs in community-based organizations (see Appendix C, Table 1).

Site-specific indicators: Quantitative data from school and program records will provide information about performance related to cognitive and behavioral engagement as well as youth demographics. Data on cognitive and behavioral engagement will include rates of project completion as well as records of enrollment, attendance, graduation, and credit completion when applicable to specific sites. Demographic information will include age, gender, race/ethnicity and participation in the free- and reduced-price lunch program (an indicator of family socioeconomic status) as available in each setting's records.

Technology use survey: An online survey will quantitatively measure student/youth digital media use outside school and program settings (see Appendix E). The survey will be given at the start of each course or project to determine the nature of the technology used by youth and its frequency. Our survey is adapted from the Study of Social and Cultural Influence on Adolescent Literacy Development at the University of Michigan (Moje, Overby, Tysvaer, & Morris, 2008) and was tested during our pilot study.

The research team provides reasonable and similar levels of detail about each data source.

Project-specific engagement survey: An online survey will measure youth's perspectives about learning and engagement during a course or project (see Appendix F). The survey will include scaled and open-ended items for all dimensions of

engagement (behavioral, cognitive, emotional) as well learning goals/outcomes. Surveys will be given at the end of each project or unit. We implemented during the pilot study and are currently refining it. It is adapted from the following existing surveys: the School Engagement Survey by the National Center on School Engagement; a survey by the COMET® Program within the University Corporation for Atmospheric Research in Boulder, Colorado; the Engagement versus Disaffection with Learning survey by Skinner, Kindermann, & Furrer (2009); and the Cognitive Strategy Use and Self- Regulation Subscales of the Motivated Strategies for Learning Questionnaire by Pintrich & DeGroot (1990).

Experience Sampling Method: We will use the Experience Sampling Method (ESM) to collect qualitative and quantitative data on youth engagement “in the moment/in action” via iPod Touches (Hektner, Schmidt, & Csikszentmihalyi, 2007; Shernoff & Vandell, 2007). This method will provide data on what youth are thinking and feeling at specific moments in time while they participate in technology-mediated settings, as well as their level of engagement. Open-ended questions such as “What are you doing right now?” and “How do you feel about what you are doing?” and “Do you want to keep doing what you are doing or switch to something else?” will help to gauge in-the-moment reflections as a way to triangulate the retrospective recall required for interviews and surveys. A small selection of scaled items drawn from the project-specific engagement survey will allow researchers to compare youth’s self-reports of engagement in-the-moment (ESM) with their reports of engagement in the project as a whole, as measured by the engagement survey. This comparison will help corroborate youth’s responses from the project- specific engagement survey, which are dependent on their recall of experiences throughout the project.

The research team uses multiple methods and sources of information to bolster the strength of their evidence.

Student/youth interviews: Individual interviews with focal youth will be conducted with a focus on understanding how digital tools and activities affected their engagement and learning. These semi-structured interviews, which will be audio-recorded and transcribed, will follow interview protocols (see Appendix G). In each site, 5-7 focal youth will be selected to participate in the interviews based on the following criteria. We are looking for focal participants who are willing to participate who display *a range* of each of the criteria:

- a. Gender (as close to equal number of males and females as possible)
- b. Race/Ethnicity (students from different racial/ethnic groups if possible)
- c. Engagement in class/program activities based on observations, ESM, project-specific engagement surveys, and the facilitators’ impressions (a range of engagement levels)

Teacher/facilitator interviews: Individual interviews with teachers/facilitators will focus on understanding her/his perceptions of learning and engagement within the setting and the ways in which pedagogical practices and technology impacted these variables. These semi-structured interviews, which will be audio-recorded and transcribed, will follow interview protocols (see Appendix H). Within the formal classroom setting, these interviews will be conducted at the end of each grading period; within non-formal settings, interviews will occur at the end of programs.

Artifacts and/or documents: During our observation visits and interviews we will gather artifacts and documents such as mission statements, rules, expectations, guidelines, and curriculum materials for use in describing the features of technology-mediated activity systems within each setting. Photographs will also be used to document the learning space for use in describing the learning environment of each setting.

Youth-created products/projects:

Youth projects or products (both in-progress and final versions) will be collected and/or documented via photos. These projects relate directly to what youth learn in settings and will aid the research team in its understanding of the “outcome” of each activity system.

Mini-cases:

Two mini-case youth who demonstrate engagement in the original study learning setting will be recruited from each research setting (6 youth total; 2 S, 2L, 2C) to observe in a comparison setting (see Appendix A, Figure 2). Specifically, 2 youth participants from the library settings will be observed in a school or CBO; 2 youth participants from our school settings will be observed in a library or CBO; and 2 youth in a CBO setting will be observed in a library or school. Each mini-case will include 4-6 observations (field notes/ASOP) of the youth in the alternate learning context, ESM data in this context (as well as primary S, L, C), artifact collection (if permitted), and additional questions about this context during the interview.

Data Analysis Plan

Theoretical Framework: Activity Theory. Learning in activity systems occurs in the sociocultural activity of people, tools, and symbols within the system. The activity theory (AT) theoretical framework expands the unit of analysis to *the activity within settings* rather than the individual (Engeström, 1999). The following list identifies the components of activity systems that AT examines with special emphasis on the mediational means of carrying out the activity (e.g. digital technology) and the object of the activity; all activity is object driven, which gives meaning to human action within the system:

1. Subject(s): the social actors or people acting on the object;
2. Object: the purpose or problem space of the activity; what is driving the activity?
What can be learned from engaging in this activity?
3. Outcome: the result of the activity (e.g. learning goal achieved; product created);
4. Tools/Signs: artifacts and symbols that mediate activity. (e.g. what means are used to carry out the activity?);
5. Rules, norms: expectations or regulations for actions and interactions within the activity system;
6. Community: what is the environment, social group, or organization in which the activity takes place?
7. Division of labor: the division of activities among social actors within the system (e.g., who is responsible for what and how are the roles organized?).

The analysis plan is tightly tied to the theoretical framework. The list of component activities provides reviewers with a guide of how an Activity Theory analysis will be structured.

Activity systems evolve through dialectical contradictions or tensions within the system. Three kinds of contradictions drive the evolution of activity systems: (a) contradictions within nodes in the system (e.g. digital tools with blocked access in sites where the safety of youth is a concern); (b) contradictions between nodes in the system (e.g. tools and division of labor such as when youth who are most competent at using digital technology take control of group projects; and (c) contradictions between intersecting activity systems (e.g. conflicts between classroom culture and home culture) (Yamagata-Lynch, 2010). Tensions such as these fuel change in systems and are an important dimension of analysis, as we learned in our pilot study. For example, when youth in

the CBO setting had technology problems at a film location (contradiction between two nodes—tool and social actor) and experienced real embarrassment to have performed poorly in the professional role they were given, they convened, planned, prepared, and worked doubly hard the next time. Sometimes, of course, contradictions are more subtle yet still drive the activity system, as when students in a classroom create digital media to serve as a kind of counter-narrative to myths about urban youth. (See the earlier pilot study section for an example of a contradiction between intersecting activity systems and its importance to the analytic process.)

Case Study. Grounded in this AT theoretical framework, we will utilize an embedded multi-case study design (Merriam, 2009), which will allow us to study several sub-units/cases (different sites) within each setting (case). This design requires two stages of analysis; the first stage is the within-case analysis and the second stage is the cross-case analysis (Merriam, 2009). For the within-case analysis, each setting (S, L, C) is first treated as its own case with several embedded sub-units/cases of analysis (e.g. C1, C2). Next, in order to answer our fourth research question, “For a subset of youth participants, how does engagement in learning vary in a comparison setting?”, mini-cases will be developed from data collected on a subset of 6 youth drawn from each setting (2S, 2L, 2C). Once we have completed the analysis of each case and six comparison mini-cases, we will begin our cross-case analysis of technology-mediated learning settings (see Figure 3).

The research team provides a rationale for the mini-cases (e.g., linked to research question #4). They also acknowledge the limitations.

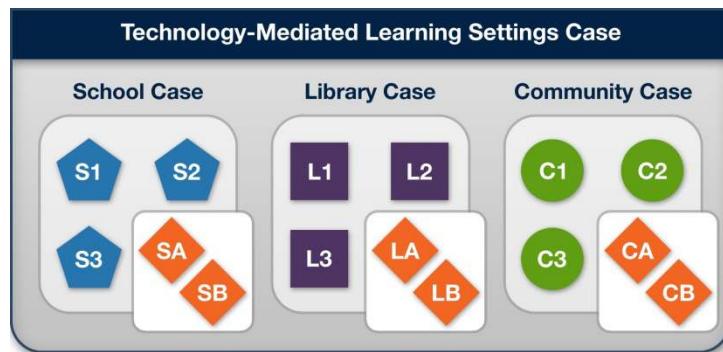


Figure 3. Illustration of the embedded multi-case study, where orange diamonds represent the six mini-cases.

Both stages of case analysis will use Activity System Analysis (ASA) (Yamagata-Lynch, 2010). For each site observation, fieldnotes will be completed. Then, selected activities from the observations found to be particularly salient in addressing our research questions will undergo further examination using the Activity System Observation Protocol (ASOP), which is grounded in ASA. ASOP observations and fieldnotes are this study’s primary qualitative data sources and the interviews and artifacts are the secondary data sources. Primary quantitative data sources include YPQA and surveys. Frequency and type of data collection varies by setting to accommodate individual site duration and length of program or grading period (see Appendix C, Tables 1 and 2).

Qualitative Data Analysis: Activity System Analysis. An activity system is not discrete, but rather intersects with and nests inside other activity systems resulting in a framework for understanding settings and their effects on human action and outcomes as a complex and dynamic interaction.

This study focuses on each site (e.g., S1, S2, S3) as a primary activity system. We will analyze each site as an embedded sub-unit/case within the larger setting category (case) of school (S), library (L), or CBO (C) (see Figure 3). Whereas our primary activity sites within each setting (e.g., S1, L2, C3) will be foregrounded, we will examine intersecting systems as they become salient through data collection and through targeted data sources connected to one of our sub-questions for the second research question, “How is each activity system shaped by its larger institutional context?” For example, in the section on pilot study findings, we discuss the contradiction between the teens’ perception regarding the program space compared to the facilitator’s perception. This indicated the need for more information about the larger institution (library) in terms of how it characterized this program in informational and public relations material and how the facilitator viewed her program’s status within the larger library context. For the proposed study, we will collect artifacts and documents as well as research the specific institution online to help us understand and define its institutional characteristics.

The ASOP was designed to help us map and delineate the components of activity and understand the relationships between the system and its components. Each ASOP component (i.e., subject, object, community, division of labor, rules, tools, outcome) will be entered into a data analysis program (Dedoose). Next completed ASOP data for each component will be uploaded and coded by research team members for patterns within each AT component (e.g. under ‘tools’, our pilot study included such codes as ‘competence,’ ‘affordance,’ ‘shaping curriculum’). Fieldnotes will also be coded using the ASOP categories in order to understand the primary observational data from an activity system perspective. In keeping with our research questions, we will identify patterns that show *how* features of each setting work to enhance engagement in learning. For example, in the pilot CBO, we were able to connect how features of that program nurtured the development of technical media production skills (e.g., using Adobe Premiere Pro CS6 to edit video, conducting interviews with camera and sound equipment) as well as vocabulary and conceptual knowledge of media production (e.g., “We have to put B-roll right here,” Tia, during week 5) necessary for the creation and composition of documentary videos. The additional sites included in this proposal will allow us to test our pilot study findings for convergence and contradiction within the broader institutional settings (library, school, and community). The goal of this ASA analysis is to understand how parts of each activity system work together as a whole and how parts are connected, contradictory, and dependent on each other. In addition, interviews with facilitators/teachers and youth will be coded and analyzed to triangulate the analysis of the observations (including areas of convergence, inconsistency, and contradiction).

The research team offers a clear roadmap for the analysis with enough details for reviewers to evaluate.

To enrich our analyses, we will develop mini-cases based on data collected on a subset of 6 mini-case youth drawn from each setting (2S, 2L, 2C) (see Figure 3) in order to address our fourth research question, “For a subset of youth participants, how does engagement in learning vary in a comparison setting?” Each mini-case will include data collected from a specific youth in both the primary setting and a comparison setting to allow for comparisons across settings. Qualitative data from observations and interviews will be analyzed using Activity System Analysis (ASA) (Yamagata-Lynch, 2010) as described above. In addition, quantitative data from ESM will be analyzed, as described below, to provide information about the youth’s levels of engagement in both primary and comparison settings. Due to the small sample size, we will not be able to conduct any statistical tests to determine the statistical significance of any observed differences in engagement, as measured by ESM. The purpose of the qualitative and quantitative min-case

analyses is to identify, for each youth, (a) how the comparison setting is similar or different than the primary study setting in which the youth participates, (b) how the youth participant's engagement is evident in the comparison setting, and (c) how engagement in learning might vary in a comparison setting.

Qualitative Data Analysis: Discourse Analysis. Decades of research have supported the central role of talk in teaching and learning. For the most part these studies have repeatedly shown the ubiquitous occurrence of teacher dominant interaction patterns (Cazden, 2001). However, another strand of research shows the positive effects on learning when youth have the opportunity to explore ideas in open-ended discussion rather than being limited to the display of factual knowledge (Mercer, 2008; Nystrand, Wu, Gamoran, & Zeiser, 2003). Research in non-formal learning settings has illustrated similar results. Heath & Roach (1999), for example, have tracked interactional patterns in community arts programs and found that the emphasis on imaginative problem solving in an apprenticeship-like environment leads to language use (such as 'what-if' speculations) that support deep learning.

Given the central role of language in learning, our study will employ discourse analysis (DA) as a secondary analytic method to aid in deepening our understanding of each site (e.g., L2, L3) and in revealing interactional patterns and anomalies within and across settings (S, L, C). Language use and interaction is often neglected in studies focusing on activity systems but several scholars (including the PI for this research) have productively combined the use of AT and DA (Moje & Lewis, 2007; Wells, 1996) in ways that illuminate how language (as a sign/tool) is implicated in components of activity. In particular, DA will be useful in understand how rules/norms have been constructed within each site and what this means for interaction with digital tools. If, for example, the ASOP reveals that youth work together on digital projects and that the division of labor is fairly equal, then using DA to determine the role of language in these processes can be illuminating (e.g. youth using speaking turns to refer to peers' ideas and build connections to those ideas).

The DA approach we will use combines interactional sociolinguistics (Erickson, 2004; Gumperz, 1992) with sociocultural discourse analysis (Gee, 2010). We will use the ASOP to identify strong patterns or perplexing contradictions related to our research questions that would benefit from a closer look at language use. Related segments of audio recordings from site observations will be transcribed for discourse analysis. Approaches to interactional sociolinguistics will provide a method for examining participant structures and contextualization cues (such as how topics are initiated, controlled, shifted, rules of entry, length and frequency of speaker turns, and so forth) that reveal classroom interaction patterns but, more importantly, youth acceptance, manipulation, and/or resistance to those patterns. To better understand the values at work in the activity system, the situated meanings of words and the belief systems that shape those meanings will be examined. For example, a youth's interaction with a facilitator or peer about the hip-hop music she loves can mean different things to different people in the setting, depending on their identities and affiliations. Whether or not the youth feels comfortable incorporating her passion for hip-hop into a digital media project (as background music or as the focal point of a poetry project) will depend on how community is created within the activity system and how acceptable behavior and content are regulated within

The research team discusses the general reason for their analytic approach (e.g., discourse analysis and the central role of language in learning).

The research team discusses the specific ways they will use discourse analysis and offer concrete examples to demonstrate what they mean.

the setting. The youth's comfort level may also relate to her competence with digital tool use and in meeting the goals of the activity. All of these possibilities exist in a view of the setting as an activity system with norms for language use and structures for participation. Discourse analysis is especially useful in examining anomalies or contradictions, and is often used to better understand data that appears to disconfirm a coding category or that is nuanced in a way that defies categorization. This function of data analysis is in keeping with our focus on settings as complex activity systems, which we intend to examine in order to understand the engagement in learning in technology-mediated settings.

As mentioned earlier, findings from our pilot study related to interaction patterns was important to our understanding of the settings, particularly related to the interactional norms and anomalies that related to the co-construction of community. In the library, for example, the language of mentorship was especially important (not surprising given that the program we studied was a peer mentoring program). Youth were invited to take a prominent role in sharing their knowledge related to the use of digital tools as well as working with their peers in both formal and informal situations. Adults did not provide youth with explicit answers to technology issues, and instead frequently called upon them to find solutions on their own and share them with the group. A closer analysis of this interactional pattern will help us to understand how this division of labor shaped engagement in learning for the peer mentors. We did not audio-record these interactions in the pilot study, but thus far, interviews indicate that the youth were motivated to problem solve and felt trusted in these exchanges. Closer analysis of discourse following the procedures described in the previous paragraph will provide more detailed information about *how* the interactions work to propel youth to deeper learning as they embrace the problem space.

When relevant, the team brings the reader back to the findings of the pilot study and links it to the proposed work.

Quantitative Data Analysis. The quantitative analysis will occur in two stages. During the first stage, we will calculate descriptive statistics for each quantitative measure from the data collected within each site. In the second stage, we will integrate the quantitative and qualitative data within each site to give us a richer, deeper, complementary data set that will extend, reinforce, or complicate the qualitative data pertaining to engagement in learning within the site. The quantitative data will be analyzed as follows within each site:

YPQA observation protocol: For each observation, the YPQA results in a score for each of four dimensions (safe environment, supportive environment, interaction, and engagement) plus an overall score. To summarize the distribution of a score, say, the overall score, across the observations we will calculate three measures of central tendency (mean, median, mode) and one measure of variability (standard deviation). We will also create a bar chart to graphically represent the dispersion of the score across observations. Three different measures of central tendency will be calculated because in data sets that contain extreme, or outlier, scores and data sets that are small, the median or the mode may be a more accurate summary statistic than the mean.

Technology use survey: We will calculate the number and percent of youth choosing each response for the scaled response items. Then we will calculate a technology access sub-score for each youth by adding up their responses to the items that measure access. We will also calculate an outside of school activity sub-score for each youth by adding up their responses to the items that measure this kind of activity. Then, for the group of youth as a whole within each site, we

will calculate descriptive statistics, as described for the YPQA above, and create box-and-whisker plots for each sub-score.

Project-specific engagement survey: For each administration of the survey within a site we will calculate the number and percent of youth choosing each response for the scaled response items and the number and percent of youth selecting each level for the rubric type item. Then, for each youth we will calculate sub-scores for each type of engagement (behavioral, cognitive, emotional) and an overall engagement score. For the group of youth as a whole within each site we will calculate descriptive statistics and create box-and-whisker plots for the sub-scores and the overall engagement score.

Experience Sampling Method: For each administration of the ESM survey within a site we will calculate the number and percent of youth choosing each response for the scaled response items. We will also calculate an overall engagement score for each student by adding up each youth's responses to the scaled response items. Then, for the group of youth as a whole within each site, we will calculate descriptive statistics and create a box-and-whisker plot for the overall score.

Because each youth will complete multiple ESM surveys over the duration of a project and/or their course/program, we will also calculate an average across surveys for each youth on each scaled response item and their overall engagement score. We will compare these results with youth reports of engagement in the project as a whole, as measured by the project-specific engagement survey to determine the accuracy of the engagement reported by youth on the project-specific survey. For the group of youth as a whole within each site, we will also create a series of box-and-whiskers plots to show the overall engagement score at each measurement point during the project. Youth responses to the open-ended items on the ESM survey will be included in the qualitative analysis.

Site-specific data: The site-specific data will be summarized as follows for each site:

Age – descriptive statistics will be calculated; *Gender, Race/ethnicity, Free and reduced lunch, Grade level, Initial and final enrollment* – the number and percentage of students in each category of the variable will be calculated; *Compiled attendance records* at the end of each semester or program – the attendance rate for each student will be calculated (number of sessions attended/number of sessions offered) and then descriptive statistics will be calculated for each site; *Grades* – the number and percentage of students receiving each grade will be calculated as one indicator of what youth participants learn; *Project completion* – the number and percentage of students who completed a project will be calculated; *Credit completion* – descriptive statistics will be calculated.

Integrating Qualitative and Quantitative Data. The research team will meet bi-monthly throughout data collection, and also during within-case analysis and interpretation phases of the study to integrate the qualitative and quantitative data. For example, during data collection we will 1) use data from the Technology Use Survey and ESM to select focal youth for the interviews, and 2) use data from the ESM survey during the interviews to help youth recall their experiences during the project. During data analysis phases, we will use the quantitative data to triangulate the observation and interview data (including areas of convergence, inconsistency, and contradiction) *within* each site. For example, we will compare the quantitative data from the YPQA to the observation and interview data to triangulate the qualitative data about the

The narrative attends to why a mixed method approach was adopted.

features of technology-mediated activity systems. We will use data from the ESM survey and the project-specific engagement survey to triangulate observation data on student engagement because it can be difficult to observe youth's cognitive and emotional engagement. Through comparative analyses of the qualitative and quantitative data we will determine the degree of convergence (Patton, 2002) between the qualitative data and the quantitative data and this will deepen our understanding of the complexities inherent within settings and engagement in learning. In our analysis and interpretation, the qualitative data will receive more weight than the quantitative data because AT is the driving theoretical framework for the study.

Cross-Case Analysis. Case narratives will be composed for each site (e.g., C1, C2) and each setting (e.g, all school sites). Narratives will be based on both qualitative and quantitative data analysis from each site. Coding of ASOPS will be primary data compared across sites to aid in development of case narratives focused on each setting. These narratives will include both commonalities and differences across sites. Case narratives of settings will then serve as the cases to be used for cross-case (S, L, C) analysis. Again, these cross-case narratives will include comparisons and differences across settings. Using these analytic procedures for our pilot study (albeit with only one site per setting) allowed us to arrive at the cross-case findings reported in an early section of this proposal. By composing case narratives for each setting based on coding and analysis of ASOPs, fieldnotes, and interviews, we were able to richly describe and interpret how each setting worked to engage youth in technology-mediated learning. We found that the problem space (object), the interactional patterns (language use), and the facilitator's assumptions about learning were central to engagement across all three settings. These findings are the result of comparing across case narratives. We expect that our cross-case narratives will be more robust for this proposed study, in that they will include quantitative data and more cases at the site level. Based on our pilot data, we speculate that we will find differences among the settings (S, L, C) related to the kind of technology-mediated learning each supports. For example, school classrooms with innovative teachers often have a curriculum that challenges youth to think critically over time across genres and modes. Library settings, on the other hand, tend to be organized as drop-in sites and, thus, engage learners through interest-driven activities rather than sustained critical thinking. We speculate that we will learn more about what engaged learning means in each setting and the conditions that create these meanings. Cross-case analyses will help us to examine these speculations and consider how they are confirmed, contradicted, or complicated by the data. This level of analyses promises to yield richly detailed results through an analytic procedure that is straightforward in its focus on comparison of commonalities and differences across settings.

References

- Bakhtin, M. M. (1986). *Speech genres and other later essays*. Austin: University of Texas Press.
- Barab, S. A., Gresalfi, M.S., & Ingram-Goble, A. (2010). Transformational play: Using games to position person, content, and context. *Educational Researcher*, 39(7), 525-536.
- Barron, B., Walter, S. E., Martin, C. K., & Schatz, C. (2010). Predictors of creative computing participation and profiles of experience in two Silicon Valley middle schools. *Computers & Education*, 54(1), 178-189.
- Bartko, T. W. (2005). The ABCs of engagement in out-of-school programs. *New Directions for Youth Development*, 105, 109-120.
- Barton, D., & Hamilton, M. (2005). Literacy, reification and the dynamics of social interaction. In D. Barton & K. Tusting (Eds.), *Beyond communities of practice: Language, power and social context* (pp. 14-35). Cambridge: Cambridge University Press.
- Benson, P., & Scales, P. (2007, November). *Search Institute's ongoing development of the theory of thriving*. Presented at the Healthy Communities Healthy Youth Conference, Rochester, NY.
- Black, R. W. (2008). *Adolescents and online fan fiction*. New York: Peter Lang.
- Cazden, C. B. (2001). *Classroom discourse: The language of teaching and learning*. Portsmouth, NH: Heinemann.
- Christenson, S. L., Reschly, A. L., & Wylie, C. (Eds.). (2012). *Handbook of Research on Student Engagement*. New York: Springer.
- Cohen, C. J., Kahne, J., Bowyer, B., Middaugh, E., & Rogowski, J. (2012). *Participatory politics: New media and youth political action*. Chicago, IL: MacArthur Foundation.
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper Collins.
- Cole, M., & Engeström, Y. (1993). A cultural-historical approach to distributed cognition. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations* (pp. 1-43). New York: Cambridge University Press.
- Delwiche, A., & Henderson, J. J. (2012). *The participatory cultures handbook*. New York: Routledge.
- Denzin, N. K. (1978). *The research act: A theoretical introduction to sociological methods* (2nd ed.). New York: McGraw-Hill.
- Denzin, N. K. (2012). Triangulation 2.0. *Journal of Mixed Methods Research*, 6(2), 80-88.
- Engeström, Y. (1999). Activity theory and individual and social transformation. In Y. Engeström, R. Miettinen, & R. Punamaki (Eds.), *Perspectives on Activity Theory* (pp. 19-38). Cambridge: Cambridge University Press.
- Engeström, Y. & Sannino, A. (2010). Studies of expansive learning: Foundations, findings and future challenges. *Educational Research Review*, 5, 1-24.
- Erickson, F. (2004). *Talk and social theory: Ecologies of speaking and listening in everyday life*. Cambridge, UK: Polity Press.
- Erstad, O., Gilje, O., Sefton-Green, J., & Vasbo. K. (2009). Exploring “learning lives”: Community, identity, literacy and meaning. *Literacy*, 43(2), 100-106.
- Finn, J. D. (1989). Withdrawing from school. *Review of Educational Research*, 59, 117-142.
- Finn, J. D., & Zimmer, K. (2012). Student engagement: What is it? Why does it matter? In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 97-131). New York: Springer.

- Fredricks, J. A. (2011). Engagement in school and out-of-school contexts: A multidimensional view of engagement. *Theory into Practice*, 50, 327-335.
- Fredericks, J., Blumenfeld, P. & Paris, A. (2004). School engagement: Potential of the concept, state of evidence. *Review of Educational Research*, (74), 59-105.
- Gee, J. P. (2007). What video games have to teach us about learning and literacy (revised ed.). *Good video games plus good learning* (Vol. 27). New York: Palgrave Macmillan.
- Gee, J. P. (2010). *How to do discourse analysis: A toolkit*. New York: Routledge.
- Gumperz, J. J. (1992). Contextualization and understanding. In Duranti, A. & C. Goodwin (Eds.). *Rethinking context: Language as an interactive phenomenon*. New York: Cambridge University Press.
- Gutiérrez, K., & Rogoff, B. (2003). Cultural ways of learning: Individual traits or repertoires of practice. *Educational Researcher*, 32(5), 19-25.
- H.R. 521. (2013). Transforming education through technology act. Congressional bill of the 113th United States Congress. Retrieved from <http://beta.congress.gov/bill/113th-congress/house-bill/521>.
- Halpern, R. (2013). *Youth, education, and the role of society: Rethinking learning in the high school years*. Cambridge, MA: Harvard Education Press.
- Heath, S. B., & McLaughlin, M. (1994). The best of both worlds: Connecting schools and community youth organizations for all-day, all-year learning. *Educational Administration Quarterly*, 30(3), 278-300.
- Heath, S. B. & Roach, A. (1999). Imaginative actuality: Learning in the arts during the nonschool hours. In E. B. Fiske (Ed.), *Champions of change: The impact of the arts on learning* (pp. 19-34). Washington, D.C.: Arts and Education Partnership and the President's Committee on the Arts and Humanities.
- Hektner, J. M., Schmidt, J. A., & Csikszentmihalyi, M. (2007). *Experience sampling method: Measuring the quality of everyday life*. Thousand Oaks, CA: Sage Publications.
- Hobbs, R., & Frost, R. (2003). Measuring the acquisition of media-literacy skills. *Reading Research Quarterly*, 38(3), 330–355.
- Hull, G., & Katz, M. (2006). Crafting an agentive self: Case studies of digital storytelling. *Research in the Teaching of English*, 41(1), 43-81.
- 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 Media and Learning Research Hub.
- Ito, M., Baumer, S., Bittanti, M., boyd, d., Cody, R., Herr, B., ... Tripp, L. (with J. Antin, M. Finn, A. Law, A. Manion, S. Mitnick, D. Schlossberg and S. Yardi) (2009). *Hanging out, messing around, and geeking out: Kids living and learning with new media*. The John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning. Cambridge & London: MIT Press.
- Jang, E. E., McDougall, D. E., Pollon, D., Herbert, M., & Russell, P. (2008). Integrative mixed methods data analytic strategies in research on school success in challenging circumstances. *Journal of Mixed Methods Research*, 2(3), 221-247.
- Jenkins, H. (2009). *Confronting the challenges of participatory culture: Media education for the 21st century*. Cambridge, MA: MIT Press.
- Kafai, Y., & Peppler, K. (2011). Youth, technology, and DIY: Developing participatory competencies in creative media production. In V. L. Gadsden, S. Wortham, and R.

- Lukose (Eds.), Youth cultures, language and literacy. *Review of Research in Education*, 35(1), pp. 89-119.
- Kelly, S. (2008). Race, social class, and student engagement in middle school English classrooms. *Social Science Research*, 37, 434-448.
- Kelly, S., & Price, H. (2014). Changing patterns of engagement in the transition to high school. In D. J. Shernoff, & J. Bempechat (Eds.), *Engaging youth in schools: Evidence-based models to guide future innovations*. New York: NSSE Yearbooks by Teachers College Record.
- Klem, A. M., & Connell, J. P. (2004). Relationships matter: Linking teacher support to student engagement and achievement. *Journal of School Health*, 74(7), 262-273.
- Knobel, M., & Lankshear, C. (2007). Sampling "the new" in new literacies. In M. Knobel & C. Lankshear (Eds.), *A New Literacies Sampler* (pp. 1-24). New York: Peter Lang.
- Lave, J. (1996). Teaching, as learning, in practice. *Mind, Culture, and Activity*, 3(3), 149-164.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Lawson, M. A., & Lawson, H. A. (2013). New conceptual frameworks for student engagement research, policy, and practice. *Review of Educational Research*. doi: 10.3102/0034654313480891
- Leont'ev, A. (1974). The problem of activity in psychology. *Soviet Psychology*, 13(4), 33.
- Lewis, C., & Causey, L. (in press). Critical engagement in digital media studies: An activity and nexus analysis. In E. Morrell & L. Scherff (Eds.), *English education for the 21st century: Teaching, teacher education, research, assessment, and advocacy*. New York: Rowman & Littlefield Publishing Group.
- Lewis, C., Doerr-Stevens, C., Dockter Tierney, J., & Scharber, C. (2012). Negotiating identities in the market economy: An analysis of critical literacy and media production. In J. Avilia & J. Zacher Pandya (Eds.), *Critical digital literacies as social praxis: Intersections and challenges* (pp. 179-196). New York: Peter Lang.
- Lewis, C., Enciso, P., & Moje, E. B. (2007). Introduction: Reframing sociocultural research on literacy. In C. Lewis, P. Enciso, & E. B. Moje (Eds.), *Reframing sociocultural research on literacy: Identity, agency, and power* (pp. 15-48.) New York: Routledge.
- Lewis, C., & Ketter, K. (2011). Learning as social interaction: Interdiscursivity in a teacher and research study group. In R. Rogers (Ed.), *An introduction to critical discourse analysis in educational research* (2nd edition) (pp. 117-146 or 119-153). Mahwah, NJ: Lawrence Erlbaum Associates.
- Li, Y., Bebiroglu, N., Phelps, E., Lerner, R. M., & Lerner, J. V. (2014). Out-of-school time activity participation, school engagement, and positive youth development: Findings from the 4-H study of positive youth development. *Journal of Youth Development*.
- Linehan, C., & McCarthy, J. (2001). Reviewing the "community of practice" metaphor: An analysis of control relations in a primary school classroom. *Mind, Culture, and Activity*, 8, 129-147.
- Mercer, N. & Hodgkinson, S. (2008). *Exploring talk in school*. Thousand Oaks, CA: Sage Publications.
- Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.
- Minnesota Department of Education. (2013). *Minnesota Comprehensive Data Assessment (MCA II) tests results*. Retrieved from <http://education.state.mn.us/mde/index.html>

- Moje, E. B., & Lewis, C. (2007). Examining opportunities to learn literacy: The role of critical sociocultural literacy research. In. C. J. Lewis, P. Enciso, & E. B. Moje (Eds.), *Reframing sociocultural research on literacy: Identity, agency, and power* (pp. 15-48). Mahwah, NJ: Lawrence Erlbaum Associates.
- Moje, E. B., Overby, M., Tysvaer, N., & Morris, K. (2008). The complex world of adolescent literacy: Myths, motivations, and mysteries. *Harvard Educational Review*, 78(1), 107-154.
- Nakamura, J. (2001). The nature of vital engagement in adulthood. *New Directions for Child and Adolescent Development*, 93, 5-18.
- Nystrand, M., Wu, L. L., Gamoran, A., Zeiser, S., & Long, D. A. (2003). Questions in time: Investigating the structure and dynamics of unfolding classroom discourse. *Discourse Processes*, 35(2), 135-198.
- Papert, S. (1980). *Mindstorms: Children, computers, and powerful ideas*. New York: Basic Books.
- Patton, M. Q. (2001). *Qualitative evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Peppler, K. (2013, July). *New opportunities for interest-driving arts learning in a digital age*. The Wallace Foundation.
- Pintrich, P. R., & DeGroot, E. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82(1), 33-40.
- Rheingold, H. (2012). Participative pedagogy for a literacy of literacies. In A. Delwiche & J. Henderson (Eds.), *The participatory cultures handbook*. New York: Routledge.
- Rogoff, B. (1995). Sociocultural activity on three planes. In J. V. Wertsch, P. Del Rio, & A. Alvarez (Eds.), *Sociocultural studies of mind* (pp. 139-164). New York: Cambridge University Press.
- Rowan, A. H., Hall, D., & Haycock, K. (2010). *Gauging the gaps: A deeper look at student achievement*. Washington DC: The Education Trust.
- Scharber, C., Lewis, C., Isaacson, K., & Pyscher, T. (with G. Hull & N. Pinkard) (2014, April). *Technology-mediated settings as pathways for engaged learning of urban youth*. Symposium presented at the annual meeting of the American Educational Research Association (AERA), Philadelphia, PA.
- Sefton-Green, J. (2012). Learning at not-school: A review of study, theory, and advocacy for Education in Non-Formal Settings. *The John D. and Catherine T. MacArthur Foundation Reports on Digital Media and Learning*. Cambridge, MA: The MIT Press.
- Shernoff, D. J. (2013). *Optimal learning environments to promote student engagement*. New York: Springer.
- Shernoff, D. J., & Csikszentmihalyi, M. (2009). Flow in schools: Cultivating engaged learners and optimal learning environments. In R. Gilman, E. S. Huebner, & M. Furlong (Eds.), *Handbook of positive psychology in schools* (pp. 131-145). New York: Routledge.
- Shernoff, D. J., & Vandell, D. L. (2007). Engagement in after-school program activities: Quality of experience from the perspective of participants. *Journal of Youth and Adolescence*, 36, 891-903.
- Shin, M., & Yoshikawa, H. (Eds.). (2008). *Toward positive youth development: Transforming schools and community programs*. New York: Oxford University Press.
- Skinner, E. A., Kindermann, T. A., & Furrer, C. J. (2009). A motivational perspective on engagement and disaffection: Conceptualization and assessment of children's behavioral

- and emotional participation in academic activities in the classroom. *Educational and Psychological Measurement*, 69, 493-525.
- Skinner, E. A., & Pitzer, J. (2012). Developmental dynamics of engagement, coping, and everyday resilience. In S. Christenson, A. Reschly, & C. Wylie (Eds.), *The Handbook of Research on Student Engagement* (pp. 21-45). New York: Springer Science.
- Smith, C., & Hohmann, C. (2005). *Full findings from the Youth PQA validation study*. Ypsilanti, MI: HighScope Educational Research Foundation.
- Soep, E. (2014). *Participatory politics: Next-generation tactics to remake public spheres*. Cambridge, MA: MIT Press.
- Stetsenko, A. (2008). From relational ontology to transformative activist stance on development and learning: Expanding Vygotsky's (CHAT) Project. *Cultural Studies of Science Education*, 3, 471-491.
- United States Department of Education (USDOE). (2010). "Transforming American Education: Learning Powered by Technology." Retrieved from <http://www.ed.gov/technology/netp-2010>
- Tseng, V., & Seidman, E. (2007). A systems framework for understanding social settings. *American Journal of Community Psychology*, 39, 217-228.
- Vadebonceur, J. (2006). Engaging young people: Learning in informal contexts (pp. 239-278). In J. Green & A. Luke (Eds.), *Rethinking learning: What counts as learning and what learning counts*. Washington, DC: AERA.
- Vygotsky, L. (1935/1978). *Mind in society* (A. Luria, M. Lopez-Morillas, & M. Cole, Trans.). Cambridge, MA: Harvard University Press.
- Vygotsky, L. S. (1962). *Thought and language*. (E. Hanfmann & G. Vygotsky, Trans.). Boston, MA: MIT Press.
- Warschauer, M. (2003). *Technology and social inclusion: Rethinking the digital divide*. Cambridge: MIT Press.
- Warschauer, M., Knobel, M., & Slone, M. (2004). Technology and equity in schooling: Deconstructing the digital divide. *Educational Policy*, 18(4), 562-588.
- Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, 34(1), 179-225.
- Wells, G. (1996). Using the tool-kit of discourse in the activity of learning and teaching. *Mind, Culture, and Activity*, 3(2), 74-101.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. New York, NY: Cambridge University Press.
- Wertsch, J. V. (1995). Mediated action and the study of communication: The lessons of L. S. Vygotsky and M. M. Bakhtin. *The Communication Review*, 1(2), 133-154.
- Wortham, S. (2004). The interdependence of social identification and learning. 2004. *American Educational Research Journal*, 41, 715-750.
- Yamagata-Lynch, L. C. (2010). *Activity systems analysis methods: Understanding complex learning environments*. New York: Springer.
- Yazzie-Mintz, E. (2010). *Charting the path from engagement to achievement: A report of the 2009 High School Survey of Student Engagement*. Bloomington, IN: Center for Evaluation & Education Policy.

Zickuhr, K., & Smith, A. (2012, April 13). Digital Differences. In *Pew Research Center's Internet & American Life Project*. Retrieved from <http://pewinternet.org/Reports/2012/Digital-differences.aspx>

Engagement in Learning

School Case

Library Case

Community Based
Organization Case

★ Mini-cases

★ Mini-cases

Table 1. Alignment of Research Questions and Data Sources

	Data Sources									
	YPQA Observation Protocol	ASOP Observation & Fieldnotes	Artifacts and Documents	Interview: Youth Participants	Interview: Teacher/ Facilitator	Youth-Created Projects and Products	Project-Specific Engagement Survey	Experience Sampling Method (ESM)	Technology Use Survey	Site-Specific Data
R1: How is engagement demonstrated in each setting?										
What are the expectations for engagement in each setting?		X	X		X					
How is engagement (cognitive, emotional, behavioral, sociocultural) evident in each setting?	X	X		X		X	X	X		X
How are the expectations of engagement similar and varied across settings?	X	X		X	X	X				X
R2: How do particular activities, digital technologies, and social relationships in each setting (S, L, C) influence youth engagement in learning?										
How does each setting function as an activity system with digital technology as a central tool?		X	X	X	X	X			X	
What do the activity systems have in common?		X	X	X						
How do the activity systems differ?		X	X	X						
How is each activity system shaped by its institutional context?		X	X		X					X
How is engagement tied to individual and interdependent components of the activity system?	X	X		X	X		X	X		
R3: What do youth learn in each setting as they engage in these activities, digital technologies, and social relationships?										
What assumptions about learning are evident in each setting?			X	X	X					
What expectations about learning are evident in each setting?		X	X	X	X	X				
What learning goals are explicit or assumed in each setting?		X	X	X	X	X				
What do youth learn in each setting?		X	X	X	X	X				X

R4: For a subset of youth participants, how does engagement in learning vary in a comparison setting?									
How is the comparison setting similar or different than the primary study setting in which the youth participates?		X	X	X					
How is the youth participant's engagement (cognitive, emotional, behavioral, or sociocultural) evident in the comparison setting?		X		X				X	

Table 2

Data Collection Frequency and Timeline Within Each Setting

RQ1: How is engagement demonstrated in each setting?	
Data Collection	Frequency
Setting: 3 High School Classrooms in urban high schools (one semester each)	
Fieldnotes	8-10 observations per classroom (frequency determined by the study's focus on technology-mediated object-driven activity)
ASOP	5-7 full ASOPs completed per classroom based on which fieldnotes best answer our research questions
Project-specific engagement survey	Administered at the culmination of major projects (2-3X per semester)
EMS (using iTouch for texting response)	1X per week from each student in class 1X per observation for focal students
Interview (student)	1X (5-7 focal students)
Youth products/projects	Collected throughout the duration of the class
Site-Specific data	Initial and final enrollment, attendance records, behavior records
YPQA	2X per month per class
Setting: 3 Library Programs (2 libraries; 2 six-week summer programs and 1 school-year program)	
Fieldnotes	15-20 observations for year-long programs; 6-10 for shorter programs
ASOP	8-10 ASOPs (longer programs) or 3-5 ASOPS (shorter programs) completed based on fieldnotes
Project-specific engagement survey	Administered at the culmination of projects (1-2 for 6-week programs and 4-6 for school-year programs)
EMS	1X per week from each youth in program 1X per observation for focal youth
Site-specific data	Demographics, initial and final enrollment, attendance per program
Interview (youth)	1X (5-7 focal youth)
Youth projects/projects	Collected throughout the duration of the program
YPQA	2X per 6 wk programs; 2X per month for school-year programs
Setting: 3 Community-based organizations (3 different programs, one at each CBO, duration will vary)	
Fieldnotes	15-20 observations for year-long programs; 6-10 for shorter programs
ASOP	8-10 ASOPs (longer programs) or 3-5 ASOPS (shorter programs) completed based on fieldnotes
Project-specific engagement survey	Administered at the culmination of projects (1-2 for every 6-weeks of programming and 4-6 for school-year programs)
EMS	1X per week from each youth in program 1X per observation for focal youth
Interview (youth)	1X (5-7 focal youth)

Site-specific data	Demographics, initial and final enrollment, attendance per program
Youth projects/projects	Collected throughout the duration of the program
YPQA	2X per 6 wk programs; 2X per month for school-year programs

RQ2: How do particular activities, digital technologies, and social relationships in each setting (S, L, C) influence youth engagement in learning?	
Data Collection	Frequency
Setting: 3 High School Classrooms in urban high schools (one semester each)	
YPQA	2X per month per classroom (GA4)
Fieldnotes	8-10 observations per classroom (frequency determined by the study's focus on technology-mediated object-driven activity)
ASOP (Classroom Focus)	5-7 full ASOPs completed per classroom, based on fieldnotes that reveal most about typical and atypical aspects of the activity system
ASOP (School Focus)	2 ASOPs focusing on the school as the larger activity system with a focus on its goals/initiatives, establishment of community, positioning of social actors, and division of labor
Site-specific data	Initial records of F&R lunch, reported demographics
Student products/projects	Collected throughout the semester
Artifacts/documents	Collected throughout the semester (e.g. curriculum materials; school docs)
Technology use survey	1X in September
Setting: 3 Library Programs (2 libraries; 2 six-week summer programs and 1 school-year program)	
YPQA	2X per 6 wk programs; 2X per month for school-year programs
Fieldnotes	15-20 observations for year-long programs; 6-10 for shorter programs
ASOP	8-10 ASOPs (longer programs) or 3-5 ASOPS (shorter programs) completed based on fieldnotes
Site-specific data	Demographics, reports
Youth products/projects	Collected throughout the duration of the program
Artifacts/documents	Collected throughout the duration of the program
Technology use survey	1X at start of each program
Setting: 3 Community-based organizations (3 different programs, one at each CBO, duration will vary)	
YPQA	2X per short-term programs; 2X per month for programs > 1-month
Fieldnotes	15-20 observations for year-long programs; 6-10 for shorter programs
ASOP	8-10 ASOPs (longer programs) or 3-5 ASOPS (shorter programs) completed based on fieldnotes
Site-specific data	Demographics, reports
Youth products/projects	Collected throughout the duration of the program

Artifacts/documents	Collected throughout the duration of the program
Technology use survey	1X in at start of each program

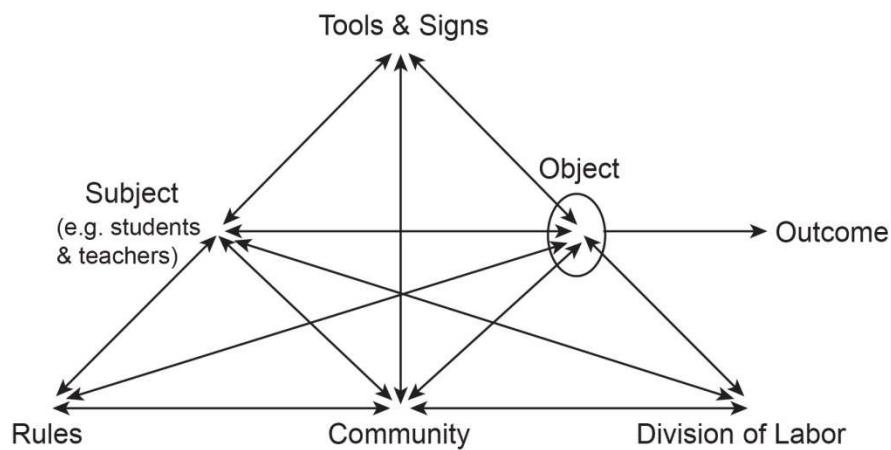
RQ3: What do youth learn in each setting as they engage in these activities, digital technologies, and social relationships?

Data Collection	Frequency
Setting: 3 High School Classrooms in urban high schools (one semester each)	
Fieldnotes	8-10 observations per classroom (frequency determined by the study's focus on technology-mediated object-driven activity)
ASOP	5-7 full ASOPs completed per classroom, based on fieldnotes that best answer our research questions
Artifacts/documents	Collected throughout the semester (e.g. assignments, curricular materials, evaluation of student work)
Site-specific records	Grades, credit completion per class, school initiatives, reports
Interview(facilitator)	1X
Youth projects/products	Collected throughout the duration of the program: completed projects collected or documented; in-progress work documented through screenshots and drafts
Setting: 3 Library Programs (2 libraries; 2 six-week summer programs and 1 school-year program)	
Fieldnotes	15-20 observations for year-long programs; 6-10 for shorter programs
ASOP	8-10 ASOPs (longer programs) or 3-5 ASOPS (shorter programs) completed based on fieldnotes
Artifacts/documents	Collected throughout the duration of the program (e.g. curricular materials, evaluation of youth products)
Interview(facilitator)	1X each facilitator
Site-specific records	Collected throughout the duration of the program: Any organization records that indicate what youth are learning (e.g. outcomes as reported to funders, institutional reports)
Youth projects/products	Collected throughout the duration of the program: completed projects collected or documented; in-progress work documented through screenshots and drafts
Setting: 3 Community-based organizations (3 different programs, one at each CBO, duration will vary)	
Fieldnotes	15-20 observations for year-long programs; 6-10 for shorter programs
ASOP	8-10 ASOPs (longer programs) or 3-5 ASOPS (shorter programs) completed based on fieldnotes
Artifacts/documents	Collected throughout the duration of the program (e.g. curricular materials, evaluation of youth products)
Interview(facilitator)	1X each facilitator
Site-specific records	Collected throughout the duration of the program: Any organization records that indicate what youth are learning (e.g. outcomes as

	reported to funders, institutional reports)
Youth projects/products	Collected throughout the duration of the program: completed projects collected or documented; in-progress work documented through screenshots and drafts

Interview (youth)	1X for each of 6 youth (2 from each original study setting)
Fieldnotes	5 observations
ASOP	2X
Experience Sampling Method	2X

EXCERPT from Appendix D:
Activity Theory Analysis Protocol (ASOP)



Directions:

Select one activity from your observed activities to complete this ASOP protocol. Bundle and upload your ASOP descriptions with your fieldnotes and any relevant images, video, or audio.

1) Description of Activity

Activity description/focus

- What activity is being observed?
- What is the genre of this activity? (e.g. assignment, rules, forms--such as Q&A or brainstorming)
- What assumptions about learning are embedded in the activity? (e.g. youth learn when they are motivated and collaborative)

2) Activity Components

Object or problem space of activity – the larger purpose or motivating problem

- What is the purpose of the activity? (stated and/or unstated)
- What are the learning goals? (stated and/or unstated)
- How much awareness of learning goals or larger purposes do social actors possess?

Outcome of activity

- What is the expected outcome of the activity?
 - Short-term (e.g. in class) student-produced work
 - Long-term (e.g. culminating project) student-produced work
- What position did social actors take related to the outcome? (e.g. motivated to complete, resisted completion)