

Connections and Missed Connections in Scratch: The Role of Caring Peers and Adults and the Power of Social Capital

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For much of the history of modern education, informal learning has been separated from academic settings. Existing studies have indicated the importance of linking out-of-school learning to discipline specific learning (Gutstein, 2012; Nasir & Hand, 2008; Nasir, 2002). For example, mathematics occurs within contexts like basketball, where players solve complex problems involving averages and percents accurately, but the same youth might have difficulty solving these problems in the context of school (Nasir, 1996). A more recent body of literature, namely that of connected learning (Ito et al., 2013), examines what happens when the separate contexts of youth learning come together and youth are able to connect to opportunities that take youth beyond the boundaries or their interest and on to opportunities that can influence their future.

Connected Learning and Connecting Out

The connection between informal and formal learning can be seen as part of a youth's ecology of learning (Barron, 2004; 2006). There are many contexts of learning that can impact youth beyond school and between school and other settings. The focus needs to be on the "learning lives" of youth, as connections across time (Erstad & Sefton-Green, 2012), highlighting the interconnectedness of the different parts of a youth's life in which they are learning. Connected learning is a framework that conceptually breaks the larger learning ecology (Barron, 2004; 2006) into three spheres: peer, interest, and academic/future. Connected learning "advocates for broadened access to learning that is socially embedded, interest-driven, and oriented toward educational, economic, and political opportunity," (Ito et al., 2013). It focuses on connecting the disparate parts of youth learning, and translating and linking that learning to opportunities like academic and career success. This framework brings new focus and energy to an old agenda. Dewey (1938) posed that education is continuous across all aspects of life. For some youth this seamless education is already a reality, with divisions generally falling along socioeconomic lines. However, for a majority of youth the links between learning contexts remain unconnected.

Access to cultivated opportunities and social capital are needed, to help close equity gaps. It is necessary for learners to have access to continual opportunities for positive experiences that offer up future trajectories (Ahn et al., 2014). Despite the challenges that this type of learning approach offers, it is achievable for youth who can connect learning between contexts. This paper will explore the connections and disconnects that occur for youth in the Scratch community, and the role that social capital and cultivated opportunity can have in fostering opportunities beyond the Scratch community.

The Scratch Community

Scratch is a free online visual coding language, used for authoring multimedia projects. It is designed primarily for ages 8 to 16 (<https://scratch.mit.edu/parents/>), but the online community has participants younger than 8 through retirement age. Scratch launched in 2007 and was updated in 2016 to allow for social interaction. The community encompasses both those who participate in the online Scratch community and those who use Scratch in local groups.

The online community is made up of two main areas. The first is the projects, which are individual creations, and studios, which are collections of projects that members of the community put together. Scratchers can comment on both individual projects, studios, and the profiles of other Scratchers. The second area is the forums. Here members of the community ask and answer longer form and more technical questions, as well as discuss and propose changes to Scratch as a coding program and as a community. The Scratch community was chosen for its direct connection to informal STEM learning, as a way to examine how informal, interest-driven learning happens in online communities and local workshop designed to facilitate learning and interest in coding for non-dominant youth. This paper describes what facilitates connections and disconnects between learning contexts.

Methods and Data Collection

The study of the Scratch community used ethnographic methods for data collection (Hammersley & Atkinson, 2007). Observation of the community took place over a 12-month period, which created a deep understanding of the community's structure. Two types of fieldnotes were collected from the online community: descriptive, data taken directly from the forums, and reflective, data that combined insights of the researcher. A thorough reading of the text was necessary to develop understanding of the community's social norms, its priorities, how people interact, and what quality participation looks like. The fieldnote collection and semi-structured interview questions focused on topics related to connected learning.

	Online Community	Out-of-School
	N=29	N=41
Gender		
--Female	35% (10/29)	41% (17/41)
--Male	65% (19/29)	59% (24/41)
Race/Ethnicity		
--White	79% (23/29)	2% (1/41)
--Latin@	0%	61% (25/41)
--African-American	0%	20% (8/41)
--Asian-American	14% (4/29)	12% (5/41)
--Unknown/Undeclared	7% (2/29)	5% (2/41)

Table 1: Demographics for Interviews

Observations, including fieldnote collection in the online community, took place from October 2014 to October 2015. Interviews took place from February 2015 to August 2015. Seventy interviews were conducted, twenty-nine of the Scratchers were selected because they

participated actively in the online community, the remaining forty-one Scratchers were selected because they were from underserved areas and used Scratch in afterschool programs. Along with this online ethnography, part of this study was to observe in-person Scratch workshops held at libraries in underserved areas. In total 165 youth have participated in workshops between May 2014 and the August 2016. The data here is presented as case studies (Stake, 2013) offering preliminary analysis of the support of connections and the disconnections for those participating in the Scratch community.

Findings

Participation in Scratch can take many different forms, including: sharing projects online, commenting on other projects and studios, participating in the forums – which usually had more in depth discussions than the studios and projects, and finally creating projects and sharing them with a local group but not sharing them online. Across these types of participation Scratchers can potentially access supports that can create connections with other opportunities. In this community two types of supports were discovered.

Cultivated Opportunity

Cultivated opportunity is an experience created for youth by a caring adult or peer. It is more than just general participation in an afterschool club or program, it is a specific set of occurrences where youth are able to personally develop while at the same time seeing beyond their current circumstance to potential future paths. Laretha, an African-American 17-year-old from South Los Angeles, who was a teen instructor for Scratch workshops in South Los Angeles, was able to leverage an interest in STEM and coding to envisioning what she viewed as an unexpected career trajectory. Laretha applied for the position as a teen instructor, which was mentioned in class by a teacher. She had an interest in coding, but she did not actually have much interest in being a teacher. “It’s really interesting and kind of ironic because I always told my mom, ‘I’m never going to be a teacher, or this or that,’ or ‘I don’t work well with kids.’ But after I came here I realized that I do actually have a little interest in that because I find a way to guide them through, and they acknowledge that.” This opportunity was heavily cultivated by the librarian who monitored the teen instructors. She highlighted the importance of leadership as an instructor and gave the teens agency to run the workshops as they saw fit.

Social Capital

Social capital can be understood as “resources embedded in social relations and social structure which can be mobilized when an actor wishes to increase the likelihood of success in purposive actions” (Lin, 2001, p. 24). Being active in the Scratch community also provides opportunity for the development of social capital in the community. Damian, a 17-year-old active Scratcher for New England, is currently applying to college where he is planning on majoring in programming and mathematics. Damian is very personable to talk to, but only has a two friends on Scratch – despite his activity in the community. When he first started using

Scratch he did not communicate much with other Scratchers, but “Somewhere along there I became more active in the other areas of the Scratch website, like commenting on projects and leaving detailed reviews of what I thought the Scratcher could improve on their Scratch project.” During this phase of his participation in the community, he created a thread on the Scratch forum where he would workshop ideas with other Scratchers, helping them refine their concepts or offering the project ideas if they were stuck. “I guess eventually the Scratch team noticed my activity on Scratch and they offered me to become a Scratch mentor, which I accepted.” From his position as a Scratch mentor, he was later elected to be an administrator for the Scratch wiki, which is a resource that is completely community created and maintained. The social capital he developed within the Scratch community facilitated his earning leadership roles in the Scratch community.

Disconnects

Disconnects are a different issue these occur from lack of supports and barriers that youth experience. Romone, an African-American 14-year-old who uses Scratch at his school Cleveland, connects with Scratch in a much more utilitarian way. “I can use it for the schoolwork like presentations or I can use it when I need a PowerPoint.” For Romone, Scratch is just a tool. His introduction to Scratch through school has created a narrower view of Scratch, as simply a homework tool. Even though he is interested in coding his view of Scratch associated with school prevents him from maximizing the potential of his interest. Jessica’s story is another example of a disconnect. She a white 14-year-old and very active Scratcher. She encountered Scratch through her brothers who were all using it to learn basic coding. When she started using she found coding to be very difficult causing her to give up. Even though she had family members in her house who coded none of them would take the time to help her. Because she enjoyed being a part of the Scratch community she found another way to participate and focuses on making art projects. Her brothers have lost interest but she is still very active on Scratch, even though she has not learned to code yet despite her desire to. She sees the value in learning to code but cannot get past the barriers of frustration while learning and having no active support for her interest.

Discussion and Conclusions

For youth where connections are being created, brokering (Ching et al., 2015) is an important component of their success. This is true both on the part of the caring adult who brokered for Laretha in her cultivated opportunity, and for Damian who brokered opportunities from the social capital which had been developed within the community. Cultivated opportunities do not exist in a vacuum and generally require the thoughtful planning of the caring adult usually to in the form of someone who ran an afterschool group or program. This is an opportunity for programs that reach youth as well as those who provide internships and career focused opportunities. Creating cultivated opportunities can be fostered for youth even with limited resources. In the case of Laretha, the librarian had very limited means, but she was able

to set up a situation for the teen that gave her the opportunity to teach and lead. Although the librarian supervised the workshop, Laretha and another teen were completely in charge of the workshops and made modifications to the workshop materials as they made them best fit for the youth participating in their library branch. This agency was not something the youth had access to in the regular learning context. It also demonstrates the importance for youth being able to explore career/professional opportunities around their interest, whether directly or tangentially related. Social capital can be more complex to facilitate because of the need for a large network, and social capital can also be exclusionary if not created with equity in mind. Social capital research indicates that restricted access to certain types of knowledge about and access to 'mainstream' opportunities and resources can have particularly negative consequences among low-income youth of color (Stanton-Salazar, 2001). Scratch, which has low barriers to entry and whose online community is carefully managed, could offer an excellent place for non-dominant youth to develop social capital in an interest community and enjoy the benefits therein. What is missing is the pathways for non-dominant youth to connect to opportunities provided within the online community and beyond.

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