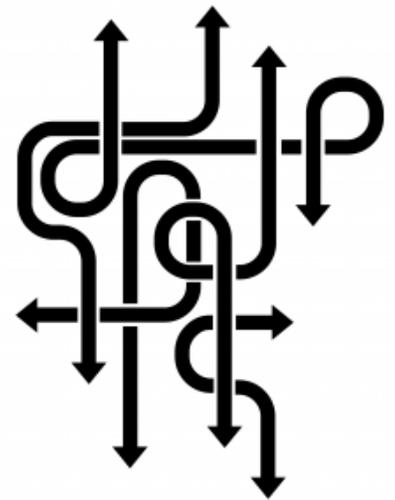


Hive Research Lab Interim Brief
Mapping Social Learning Ecologies of Hive Youth
April 2014
Youth Trajectory Research Strand



Prepared by Dixie Ching, with Rafi Santo, Chris Hoadley & Kylie Pepler

Hive Research Lab Interim Briefs are designed to provide the Hive NYC community with ongoing frameworks, findings and recommendations related to the Lab's two research areas: supporting **youth interest-driven trajectories and pathways**, and developing the Hive as a context for **networked innovation**. The briefs are part of a broader effort to connect current research and emerging findings to issues of practical importance to the community in order to improve network activity. Recommendations are preliminary and based either on existing literature or observations of practice within the network.

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Introduction

Young people learn and grow in a social context involving multiple relationships. Augmenting the “learning ecology” (Bronfenbrenner, 1979) of a youth with guidance and support from key individuals and organizations may lead to more positive academic and social outcomes, particularly for disadvantaged children. Providing access to resourceful adults and peers within afterschool programs is an especially salient issue for the Hive NYC Learning Network, as sustained engagement in digital media and technology-related activities often requires access to resources including equipment and expertise that may be challenging for youth to attain from their home environments.

In our second interim research brief on supporting youth trajectories of learning and development, we describe our recent work exploring how adults and peers have aided youth who participate in Hive member-affiliated activities, which include afterschool and summer programming, as well as one-off events.¹ Drawing from interviews conducted with our case study youth, we articulate a set of 16 supportive roles—encompassing Material, Knowledge Building, Emotional, Brokering and Institutional forms of support—that our youth identified as being important to them. We also describe how we developed visualizations of these supportive roles and the adults and peers behind them, forming maps of something we call a social learning ecology (SLE), or “*the assemblage of individuals including family adults, non-family adults and peers that provide material, knowledge building, emotional, brokering and/ or institutional forms of support for the purposes of initiating or sustaining a youth’s interest-related pursuit(s) at particular points in time.*” These maps may be used to better understand and characterize aspects of a young person’s SLE, such as *redundancy of support* and *diversity of sources* that we hypothesize may be consequential to sustained engagement in certain activities. Also, comparing a youth’s SLE map at different time periods demonstrates the dynamic nature of social learning ecologies generally and how certain providers (and thus forms of support) may be more transient in a young person’s life than others. Overall, we hope the findings summarized here may provide the Hive community with some useful insights into how a young person’s social learning ecology, with Hive educators as a critical aspect of it, may intersect with one’s ability to engage in interest-related pursuits.

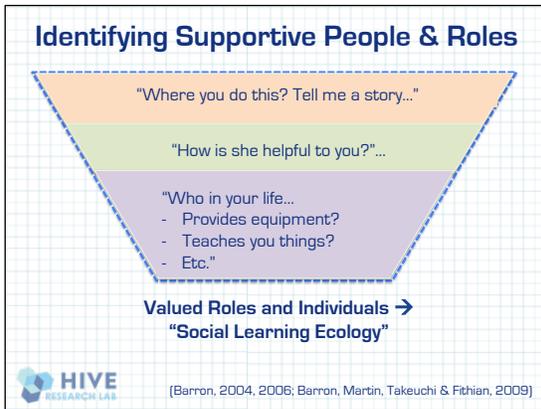
Methodology: Identifying supportive social roles

In order to identify important social roles for learning, we drew inspiration from the work of Barron, Martin, Takeuchi and Fithian (2009), who interviewed parents and middle school children from middle-class families and arrived at eight parental roles that were important to technical fluency (see Table 1 in the Appendix). Barron and colleagues intentionally chose participants who displayed high technological fluency in order to ensure that these learning roles would be salient in their data. We have extended this line of work by identifying learning roles consequential to an older, more ethnically and more socioeconomically diverse population of youth. We expected additional or different forms of support to emerge because of the important role that we’ve observed non-family adults such as mentors and program educators and other peers playing in the lives of our youth cases.² Our youth cases also showed more variability in terms of their level of expertise when it came to their interests.

We conducted interviews with each of our youth cases to understand how they viewed social support in their environment. In order to ensure that we had an accurate picture of the supportive roles played by various actors in the lives of our youth and to try to also capture these examples in their own words,

¹ These opportunities have been supported through the Hive Digital Media Learning Fund as well as other sources.

² High-school-aged youth generally have more relationships beyond their family, compared with their middle-school counterparts (Steinberg, 1990); researchers have reported less parent technological knowledge and co-participation among families of non-dominant youth (Warschauer & Matuchniak, 2010); survey data from the Connecting Youth study indicate that 51 percent of sampled African American/Black youth reported living in single-parent homes, which may indicate that they have less contact with their parents as compared to youth whose live with both parents.



we created an interview protocol that would work like a funnel (see figure at left), starting with general questions and then narrowing and becoming more specific as we went along. First we asked youth to tell us how they pursue a particular interest (or discrete set of interests) over various settings, including home, school, afterschool programs and organizations, community centers, religious centers and online.³ Next, using a list of the people mentioned in these descriptions, we asked our youth to think about each person and to talk about all the ways that that person was helpful when it came to that youth's interest. And finally, taking the roles identified by Barron et al.

(2009) (Table 1, Appendix A), we asked youth to provide names of people (if any) who fulfilled each role, prompting youth to think of parents, relatives, siblings, cousins, friends and non-family adults in their lives. Taken together, this line of interviewing gave us information about the roles and individuals that youth identified as important to them.

Finding #1: Introducing a framework of supportive roles and categories

Our next step was to analyze this corpus of data to distill the various descriptions of support into a discrete set of roles. After multiple rounds of 'top-down' and 'bottom-up' coding, we identified 16 roles, comprising both the previously identified roles from Barron et al. (2009), as well as new roles that emerged from our interviews. We've organized these roles into five categories encompassing Material, Knowledge Building, Emotional, Brokering and Institutional forms of support. Also, we call this youth-centric accounting of support made up of helpful roles and the individuals who play them the *social learning ecology* around a particular interest. Table 1 provides brief descriptions of each category, the roles that we identified within each category, and some examples from our data.

Table 1. Social Learning Ecology: Description of Support Categories and Roles

<p>MATERIAL – support around providing access to material resources including equipment, software, etc. Our youth often discussed their (successful and unsuccessful) efforts to gain access to material resources such as laptops, video editing software, video cameras, and still photography cameras.</p> <p><i>Roles:</i></p> <ul style="list-style-type: none"> • <u>Buys/Lends Resources (Res1)</u>: Buys or lends out material resources. • <u>Allows Use of Resources (Res2)</u>: Lets youth use material resources at provider's location. <p><i>Examples:</i></p> <ul style="list-style-type: none"> • Freélyn's graphic design teacher gave her a computer mouse (<i>Res1</i>). • Hive org program facilitator gave Freélyn and Krissy permission to come by and use the office laptop (<i>Res2</i>).
<p>KNOWLEDGE BUILDING – support around helping a youth improve in her interest area. Our youth valued the access they had to teaching artists in their programs; they also often spoke about learning from other peers and teaching others. The roles in this category also include providing feedback as well as collaborating on a project, which often includes various opportunities for knowledge building.</p> <p><i>Roles:</i></p> <ul style="list-style-type: none"> • <u>Teaches (Teach)</u>: Teaches youth interest-related skills. • <u>Learns From (Learn)</u>: Learns something from youth or gives youth an opportunity to teach others. • <u>Gives Feedback (Feed)</u>: Provides feedback on something youth created. • <u>Collaborates (Collab)</u>: Collaborates with youth on a project. <p><i>Examples:</i></p> <ul style="list-style-type: none"> • Teaching artists were hired to provide video editing instruction for Freélyn, Krissy and Clarence (<i>Teach, Feed</i>). • Freélyn, Krissy and Clarence collaborated on their video projects (<i>Collab</i>). • MCMotherboard taught educators how to use Mozilla Webmaker tools (<i>Learn</i>). • Freélyn's professional photographer provides feedback as well as pointers on her videos (<i>Feed</i>).

³ Drawing from the Learning Ecology framework developed by Brigid Barron (2004, 2006)

EMOTIONAL – support around providing encouragement and acknowledgement around a youth’s interest. Youth discussed “emotional support” in many different ways, but the common thread was that this form of support contributed to developing a sense of community and belonging around an interest. This form of support may be especially important when the interest is relatively new to a youth.

Roles:

- Encourages (Enc): Provides encouragement, generally and specifically, around the youth’s interest.
- Talks shop (Talk): Has expert conversations or ‘talks shop’ with youth around interest-related activities.
- Follows Activity (Foll): Follows youth’s interest-related accomplishments in a way that is visible to youth.
- Recognizes Activity (Recog): Refers positively to youth’s interest or aptitude related to her interest in a way that is visible to youth.

Examples:

- Krissy’s boyfriend encourages her to identify what she’s interested in and pursue it (*Enc*).
- Skater youth organization executive director replied to a Facebook post in which Freélyn shared her video and thanked everyone involved (*Foll*).
- Anthony had a group of school friends in Jamaica who would trade accomplishments and news about mobile technology (*Talk*).
- Freélyn’s graphic design teacher designated her “Student of the Month” because of her work (*Recog*).

BROKERING – support around helping youth make important connections, to new people, new ideas, possible futures, as well as exposing youth to uncharted areas, models, and frames related to an interest. Our youth occasionally spoke about experiences that changed their perceptions of what was possible or what they should be striving for. They also valued individuals who helped them integrate an interest with their college or career plans. Obtaining academic and career advice was important to our youth because many of them felt they were on or nearing the ‘threshold of adulthood.’ This type of brokering support also aligns with recent calls for learning environment that more intentionally support youth who wish to extend their interests beyond informal or home spaces and into other institutional arenas (Ito et al., 2013).

Roles:

- Brokers Opportunities (Brok1): Seeks out and shares learning opportunities like programs, scholarships, competitions, speaking engagements, etc. related to youth’s interest.
- Brokers Resources (Brok2): Introduces or makes youth aware of other potential resource providers, institutions and/or information channels related to youth’s interest.
- Provides Academic Advice (Aca): Provides academic-related advice/assistance so that youth can continue engaging in interest in an academic setting.
- Provides Career Advice (Car): Provides work or career-related advice/assistance so that youth can continue engaging in interest in a work setting.

Examples:

- Anthony’s program coordinator sends out email blasts about upcoming events and programs (*Brok1*).
- For Clarence, working with his mentor has lead to friendships with other game designers, programmers (*Brok2*).
- Hive organization educators helped MCMotherboard with her college essays and scholarships (her interest is design and technology and she was applying to engineering colleges) (*Aca*).
- Anthony is interested in providing an online editing service in order to continue engaging in his interest in photography; his dad gave him some advice including explaining the principle of supply and demand (*Car*).

INSTITUTIONAL – support around giving youth a structured or formalized way to engage in her interest or conferring upon the youth some organizational affiliation. Getting an internship or being given some affiliation to an organization was motivating to our youth and seemed to boost their self-confidence.

Roles:

- Employs (Emp): Gives youth a structured or formalized way to engage in interest.
- Confers affiliation (Aff): Confers organizational affiliation.

Examples:

- Hive org educator hired Krissy, Freélyn and Clarence to be mentor-videographers or ‘Pros’ (*Emp*).
- The executive director of the skater youth organization provided Freélyn with an organization email account (*Aff*).

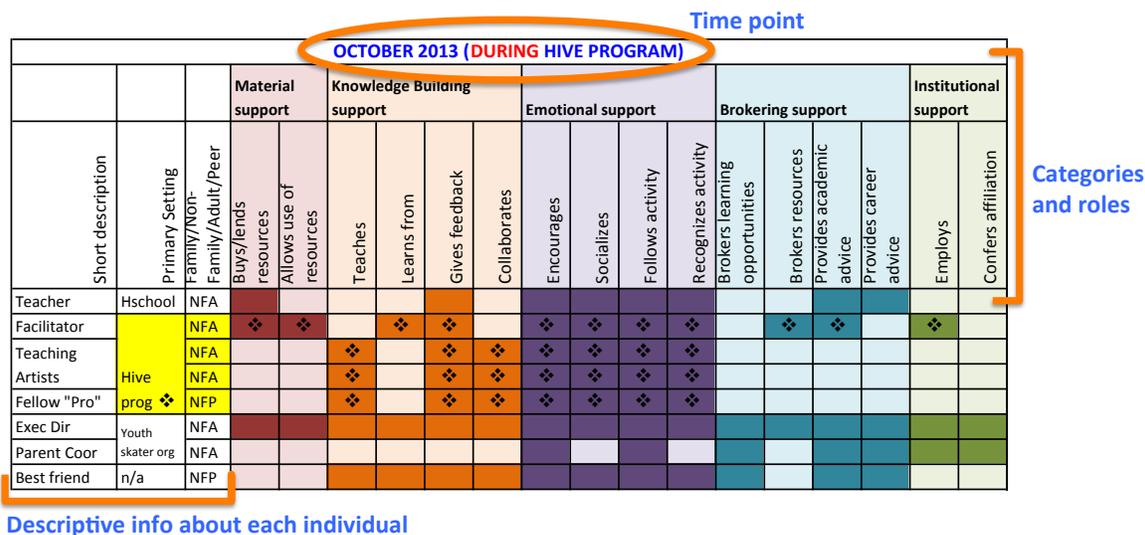
In the next section, we describe how we are using this framework of roles and categories to describe and learn more about the nature of support available to our youth. Since our interviews probed both for helpful roles as well as the people who fulfilled those roles, one reasonable next step was to integrate this information and form a map of one’s social learning ecology. In the next section, we

provide a few examples and discuss how such maps might be useful for understanding how to better support youth interest-driven pathways.

Finding #2: Social Learning Ecology maps as visualizations of supportive roles and categories

Using the categories of support in Table 1, we have been exploring useful ways to represent or map a young person’s social learning ecology (SLE), which we define as “the assemblage of individuals including family adults, non-family adults and peers that provide material, knowledge building, emotional, brokering and/ or institutional forms of support for the purposes of initiating or sustaining a youth’s interest-related pursuit(s) at particular points in time.” See Figure 1 for an example of how we’ve mapped the SLE of one of our youth participants, Freélyn, an 18-year-old female community college student who has strong interests in skateboarding, graphic design and filmmaking and who would one day like to start a skateboarding brand.

Figure 1. An example of a social learning ecology map.



The first row provides information about the general time period (“OCTOBER 2013”) during which this description of her SLE applies. The next two colored rows underneath correspond to the categories and specific support roles within each category as discussed above and summarized in Table 1. The remaining colored rows represent the individuals that comprise Freélyn’s SLE. Each provider has general descriptive information including 1) General title or relationship to Freélyn (i.e., teacher, program facilitator, teaching artist, etc.), 2) The primary setting of each provider (i.e., High school, Hive program, etc.); and 3) How the provider is related to Freélyn, (i.e., Family Adult-FA, Non-Family Adult-NFA, Family Peer-FP or Non-Family Peer-NFP). Finally, a darkened colored square indicates the type(s) of support each member provided, and a “❖” symbol was used to help visualize which sources of support were tied to a Hive NYC-affiliated program.

Of course, an important issue to always keep in mind is that there are people behind these supportive roles (which may seem disembodied when displayed as columns on a spreadsheet) and that the provision of support is a choice a provider makes, oftentimes based on the relationship she has with a youth. A critical question, once we have a better baseline sense of these Social Learning Ecologies, is how SLEs actually develop and become more or less robust, particularly from the perspective of ways youth exert their agency to recruit and leverage members of their SLE. In a forthcoming brief, we will be exploring this issue, taking into account the practices that young people enact to form these bonds as well as other contextual factors that may be at play.

Finding #3: SLE Characteristics: Family support, redundancy of support and diversity of sources

On a basic level, by mapping SLEs based on youth perspectives around how they are being supported and whom they feel they are being supported by (or choose to be supported by), we gain useful information

that could generally help how one might support youth. For example, SLEs may point out deficits in support that a program facilitator could try and funnel more assistance towards; a particular youth's SLE may also indicate which human channels that youth may choose to receive this support (i.e., hearing about learning opportunities through a Hive educator versus a best friend versus a teacher).

In this section, we will use Freélyn's map to discuss other characteristics of SLEs that may be salient when considering how to support interest-driven learning pathways. For instance, it appears that family members do not play a role in Freélyn's supportive network. This dearth of *family support* is also reflected in the conversations we had with Freélyn concerning the people she talks to about her interest-related activities, which include sharing artifacts like skate videos that she's produced. Freélyn mentioned to us that she doesn't tell her mom (whom she lives with) about her filming activities, preferring instead to share her work with individuals from the skateboarding world, including a professional photographer she met through her internship at the skater youth organization.

Interviewer: Does your mom hear about when you make a film?

Freélyn: No, not really. She doesn't even know how much I like filming.

Interviewer: Okay. How about [professional photographer], do you tell him about what you're doing?

Freélyn: Yeah...when I see him, I tell him what's going on with filming and stuff like that. I'm actually going to send him [my recent] edit. I forgot to do that, but he is the type of person who I would go to and say, "Hey, look at this. Tell me what you think," or something like that because he's [professional photographer].

Freélyn's social learning ecology also seems to have a fair amount of *redundancy of support*, in that more than one individual fulfills each role, with the most redundancy occurring in the Knowledge Building and Emotional support categories⁴—in other words, Freélyn benefits from knowing more than one person whom she could reach out to for equipment, who might offer encouragement or advice to support her dreams, and whom she could talk to about her future plans. We also note a *diversity of sources*, in that providers come from four different settings: School, Hive-affiliated programs and organization, the skater youth organization and 'n/a,' which is used when naming a single setting is not appropriate. Other factors that may affect robustness include the number of adults (versus peers) in one's SLE, as well as whether or not the individuals who provide 'redundant' forms of support come from different settings, an important distinction that we will discuss later.

As we move from identifying a comprehensive set of roles that would make up an SLE framework to using this framework to map out the learning ecologies of various youth, we may see how different patterns of abundance and scarcity might reflect important differences in the ways youth describe feeling supported to pursue their interests. For example, when a youth participant indicates that a provider offers multiple forms of support, this may signify a deeper and more enriched youth-provider relationship, compared with a provider whom a youth perceives as offering help more narrowly (Moll, Amanti, Neff & González, 2001). This is evident in the ways that Freélyn spoke about the individuals who provided multiple forms of support according to her SLE map. Said Freélyn about the Hive program facilitator: "She's my, my [Hive program] woman, like, I love [her] with all my heart. She's so sweet, so so sweet." Regarding the two founders of the skater youth organization (the executive director and parent coordinator), Freélyn said, "basically those two women are the most, the higher figures of my life." And finally, Freélyn's description of her former high school teacher, who introduced her to graphic design, also speaks of a close relationship:

Freélyn: He just...he threatens me, like "If you don't go to school, we're going to have problems" and all that stuff. But he's supportive, like he does it

⁴ This idea to describe the nature of support and of supportive relationships has been discussed by other researchers using different terms, including density and range (Barron et al., 2009), thick and multi-stranded (Moll, Amanti, Neff & Gonzales, 2001), and uniplex and multiplex or multi-stranded (Stanton-Salazar, 2001, 2011).

in a supportive way.

[...]

Interviewer: Aw, great. Does he also send you opportunities and urge you to sign up for things?

Freélyn: He would bust his butt just to look for a scholarship, many scholarships for me to sign up for, and I'm just like "Aw, thank you" you know? Yeah, he's like a brother. He's young, so I call him my brother.

Moll et al. (2001) also point out that individuals who provides multiple forms of support are likely have an increased awareness of who the youth is in terms of her needs, activities and future goals and thus may hold a richer portrait of her—for example, they may see her as a young woman who wants to be a graphic designer some day, who has an impressive portfolio of work, and who visits an organization every week to use a computer because she doesn't own a laptop, as opposed to simply observing that she is "someone who is interested in graphic design." In the end, when providers have a more multifaceted awareness of a young person, they are able to offer not only more but also more helpful forms of support.

This section introduced the concept of a social learning ecology map and discussed some ways that such a visualization may reveal important aspects of a youth's actual and perceived supportive environment. In the next section, we will also show how mapping support at critical time points brings to light the dynamic nature of this ecology.

Finding #4: Youth's social learning ecologies are dynamic

Using the mapping framework described above, we are also able to create a snapshot of a youth's perceived social learning ecology at critical moments in time. In our previous brief, we considered the effect that losing access to "program-embedded" resources (i.e., video equipment and teaching artists that are available only for the duration of the program) might have on a youth's efforts to continue engaging in her interest-driven pursuits. Here, we can visualize what this withdrawal of resources means in terms of the kinds of support that a youth might experience.

For example, note how Freélyn's SLE changed from one time point to another (figure 2): in early October when she was still participating in a Hive program as a mentor-videographer/'Pro' (left pane) and then two months later, about a month after the program had ended (right pane). Comparing both maps, it is evident that there was a loss of support originating from the Hive organization—a phenomenon we have called a "post-program slump" in support in our previous brief. This change in program-embedded support corresponds with the interviews and fieldnotes we captured during those time periods as well. While the program was in session, all youth serving as Pros had access to video cameras, laptops with editing software, and professional video editors who provided instruction, feedback and advice; when the program officially ended, participants stopped meeting and the Pros no longer had regular access to the organization's laptops and equipment; also, the teaching artists began focusing on other employment prospects and engagements and generally did not have any further contact with any of the Pros or other youth participants.

Despite the official withdrawal of support, the maps in figure 2 also show that it is still possible for youth to access program-embedded forms of support, depending on the relationships that youth and providers have managed to form. In the case of Freélyn, after the program had ended, she maintained ties with the Hive program facilitator, who agreed to let Freélyn borrow the organization's video camera on occasion and also to come by the office to use the organization's laptop for her video editing. Also, the program facilitator continued to follow Freélyn's accomplishments after the program ended and provided encouragement around the subsequent video projects Freélyn was engaging in.⁵

⁵ Freélyn's SLE at the second time point also shows how social learning ecologies can change in the positive direction as well. Her SLE grew in December because she was accepted into an amateur skateboarding team as their videographer (see "Skate team," right pane, highlighted in blue).

Using SLE maps as a complement to our interviews and observational fieldnotes, we can also begin to elucidate the relationships between social learning ecologies and the development of long-term interest-driven pathways. As an example, we introduce the SLE map of another youth who was also hired as a mentor-videographer/‘Pro’ in the Hive program, along with Freélyn and Clarence (figure 3). Krissy, who is Freélyn’s best friend, is also 18 years old and attends the same community college as Freélyn. Despite the fact that they know many of the same people including individuals connected to the Hive program and the skater youth organization, our two youth cases reported different patterns of engagement in filmmaking post-Hive program: During the period covering November 2013 to January 2014, Freélyn was asked by a friend connected to the skate youth organization to produce a short skateboarding video and joined an amateur skate team as a videographer. In contrast, Krissy did not report any significant interactions with resource providers during that same time period. And although Krissy had expressed an intention to pursue video editing as a career⁶ while she was enrolled in the Hive program, when we interviewed her after the Hive program ended, we found that her interest in filmmaking had become more tentative: She did not end up buying a laptop to continue building her video editing skills as she had stated she would; also during one interview, she announced her decision to keep her college major as criminal justice, and mentioned that she had been soliciting advice about working in the security sector. Although Krissy did eventually switch her major to Video, Art and Technology, looking back on that period between the end of the Hive program and the start of classes at her community college, Krissy said, “It was my lost moment. I didn’t have the filming interest anymore.”

What could be contributing to the differences in interest-driven learning trajectories between these two youth cases? Interest level is of course an important factor. In all our interviews with Freélyn, she has spoken consistently about her passion for skateboarding, graphic design and filmmaking. Krissy, by contrast, has shown to be more tentative about her interests, which include criminal justice, art and filmmaking—in fact, participating in the Hive NYC program was Krissy’s first hands-on experience with filming and video editing. Another compelling factor could lie in the differences in the redundancy of support and diversity of sources in their social learning ecologies. Both Freélyn and Krissy lost a major source of support after the Hive NYC program ended, especially in the knowledge building, emotional, and brokering support realms. And while both young women had redundant sources of support in those areas, Freélyn’s sources were adults with significant resources and more social and human capital compared to Krissy’s sources, who were peers (i.e., her best friend Freélyn and her boyfriend). In addition, Freélyn’s primary sources of support—her former teacher, the Hive organization program facilitator, and the founders of the skater youth organization—represent individuals from three different settings (i.e., reflecting an SLE with a *diversity of sources*). This is important for the robustness and resiliency of one’s social learning ecology because it may allow for people and sources of support to drop out (temporarily or permanently) due to general life course changes (i.e., graduating from high school, finishing an afterschool program, moving, etc.) without instrumentally affecting one’s ability to draw upon the necessary support to continue pursuing an interest.

We are still in the early stages of considering useful and impactful ways of representing a young person’s social learning ecology. Classification frameworks, such as the one we present here, are not meant to be universally generalizable; they are designed with a certain purpose in mind, and as such, will always carry certain biases and limitations. A primary drawback to the current representation is that it does not convey well the relative impact that each member has (nor do we specifically measure that through our existing protocols). Nevertheless, SLE maps do seem to confer some degree of usefulness by aiding us in generating hypotheses regarding contextual factors affecting a youth’s supportive ecology at a given point in time, and contributing to our emerging understanding of how SLEs (both writ large and through the effects of individual members) may mediate engagement in interest-related pursuits.

⁶ See our Interim Research Brief introducing our youth cases: <http://hiveresearchlab.org/2014/02/24/youth-trajectories-interim-brief-1-introduction-to-case-portraits-of-hive-youth>

Conclusion

When looking to engage youth in an activity, there is often a focus on their passions, based on the reasoning that youth will always be motivated to pursue activities that they are “interested in.” This brief, however, raises the possibility that decisions around interest-driven pursuits may involve a more complicated calculus. As the case of Krissy helped to illustrate, when certain forms of support become inaccessible (from a youth’s standpoint), it may decrease one’s motivation to continue pursuing activities around an interest that require those resources, especially when that interest is new. When Krissy was part of a Hive-affiliated afterschool program, she spoke about interacting with knowledgeable adults and peers and cultivating friendships with them, building skills and knowledge, using equipment and tools, and hearing about other learning opportunities. Once the program was over, Krissy did not (or felt unable to) access many of the forms of support she had before. One can imagine how her appraisal of this change in “support opportunities” may have affected her motivation to continue engaging in her interest in filmmaking, which was already somewhat tentative to begin with. Among our youth cases, it also seemed that those who have a strong affiliation with a particular organization that meets many of their interest-related needs (i.e., MCMotherboard) or who have close ties to many resource providers, including teaching artists who engage with the Hive (i.e., Clarence Johnson) seem to report SLEs with the kind of redundancy of support and diversity of sources that can act as a buffer against any sort of slump. Young people who don’t have a “home organization” or a robust network of providers are likely the most vulnerable to and affected by losses in program-embedded support.

Also, we did observe activity on the part of Hive adults in terms of striving to maintain certain forms of support and connections after the end of a program—Hive educators sharing learning opportunities with youth on their mailing lists was probably the most prevalent example of this. Youth also showed agency in this regard. Freélyn, for instance, asked the Hive organization program facilitator if she could borrow the organization’s camera and laptop, an arrangement the facilitator agreed to although it created some minor inconveniences with other organization staff, who also needed to use this equipment. The facilitator also talked to us about her efforts to continue providing support to the skater youth population in general, saying that when a program is over, “[It] doesn’t mean you can just say ‘sorry that relationship doesn’t exist until we have funding again.’ [It’s] important to keep that relationship going over the long term especially with this population [of youth]...and I don’t know, I enjoy those kids, I like them and this seems worth spending my time on.” Accordingly, in January this Hive educator co-organized an event with the founders of the skater youth organization for youth to come by and receive free legal counseling and college planning advice; the Hive educator has also been helping one of the program’s former youth participants with his college applications.

Overall, as heartening as it is to hear about individuals in the Hive who are devoting extra time and energy to supply youth with a consistent source of support (and sometimes even causing strain within their organization in order to do so) this is not a sound or scalable solution. We look forward to an opportunity to discuss and design with the Hive community ways to create more efficient and streamlined approaches to providing all Hive youth with social learning ecologies that are redundant, diversely sourced and resilient to change.

In this brief, we discussed our work with high school students and recent high school graduates around identifying additional helpful roles that are important for supporting their interest-driven pursuits. Drawing from interviews conducted with our case study youth, we demonstrated how these supportive roles, along with the individuals that play them, may form dynamic maps of a youth’s social learning ecology and how such visualizations could reveal insights that might spark discussion about mentorship within the Hive NYC community. Our next steps include applying this framework to other youth cases in order to test the applicability and alignment of these roles and categories with a wider range of youth in the Hive. Once we have a more finalized framework of supportive roles, we hope to explore how mapping SLEs can not only reflect a youth’s experiences but also may point to important areas of support that a youth may not be taking advantage of. Overall, we hope that our work in this area will contribute to the design of both Hive and other learning environments.

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Appendix.

Table 1. Coding categories for parent learning roles (from Barron et al., 2009)

Teacher (T)	Parent has taught child how to do something on the computer over some period of time, which can be either low or high fluency in nature (i.e., word processing to programming). Parent possesses more knowledge about subject than does child.
Project Collaborator (PC)	Parent has collaborated with child on a project. Parent may or may not know more about subject than does child. Project is a shared learning experience.
Learning Broker (LB)	Parent seeks learning opportunities for child by networking, searching the Internet, talking to other parents, and using other sources of information. Signs child up and provides necessary support for endeavor.
Resource Provider (RP)	Parent has provided resources to child beyond the family computer (e.g., books, video equipment, software, online accounts) in support of child's technology learning. Resources can be those owned by parent and used by child or purchased specifically for child.
Nontechnical Consultant (NTC)	Parent provides information/advice to child on nontechnical issues such as business or artistic design. Role also covers times when parent provides basic encouragement or advice on topics such as project management and learning organization in order to encourage child to continue his or her learning.
Employer (EMP)	Parent employs child for technical services rendered. Role can include a formal paid position or more informal activities such as technical support for a home computer.
Learner (LRN)	Parent learns technical skills/content from child.
Monitor (MON)	Parent imposes rules or limits on child's technology use (time, activities, websites, etc.) out of concerns for child's safety, identity, balance, academic performance in other areas, health, etc.

Table 2. Brief description of five youth case studies¹

Clarence Johnson is a 19-year old male of South Asian heritage. He and his older sister currently live with their mother. Bengali and English are spoken at home. He graduated last June from a public high school in Manhattan. His interests include: photography, video editing, creative coding, industrial design, longboarding, and education reform. Clarence is/has been a part of four Hive-affiliated programs/events: as a participant and later mentor of a wearable technology game design program, as an exhibitor at a youth technology and design fair, and as a mentor-videographer of a game design program for skater youth.

Freélyn Sapphire Domenico is an 18-year old female of Dominican heritage. She lives with an older brother and sister and their mother. Spanish and English are spoken at home. She and Krissy each call each other their best friend. Her interests include: photography, graphic design, filmmaking and skateboarding. Freélyn has participated in two Hive-affiliated programs targeting skater youth organized by the same Hive organization. The first program focused on filmmaking and the second program focused on Arduino-based game design. Like Clarence and Krissy, Freélyn was brought on as a mentor-videographer. Freélyn currently attends community college in Manhattan, where she is majoring in graphic design.

Krissy is an 18-year old female of Dominican and Pakistani heritage. She lives with her younger sister and their mom. Spanish and English are spoken at home. She and Freélyn each call each other their best friend. Her interests include: film editing, skateboarding, and law. Like Clarence and Freélyn, she was a mentor-videographer at the Hive-affiliated program targeted at skateboarder youth. This program was her first exposure to filmmaking. Krissy currently attends community college in Manhattan, where she is majoring in video, art and technology.

MCMotherboard is a 17-year old female who emigrated from Nigeria about five years ago. She and her two siblings currently live with foster parents. English and Yoruba are spoken at home. She's a senior at a public high school in Manhattan. Her interests include: technology, engineering, design, volleyball and reading. For the past 4 years, she's been a member of a year-round technology and design program. She has been very active in Hive opportunities including serving on a youth committee that helps plan a youth technology and design fair and presenting at a popular DIY/maker festival in Queens.

Anthony is a 16-year old male who emigrated from Jamaica about a year ago. He and his parents and his three younger siblings are currently living with relatives. English and Jamaican Creole are spoken at home. He is a sophomore at a small public high school in Brooklyn. His interests include: tinkering with technology, Spanish and photography. Anthony has participated in two Hive-related activities: a one-day design challenge aimed at spreading awareness of teen sexual cyberbullying, and a program to develop a location-based mobile game.