Connected Libraries:

Surveying the Current Landscape and Charting a Path to the Future

Kelly M. Hoffman
Mega Subramaniam
Saba Kawas
Ligaya Scaff
Katie Davis

connectedlib

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About the Authors

Kelly M. Hoffman is a doctoral student at the University of Maryland's College of Information Studies. She has a decade of experience in corporate knowledge services and serves as a social media manager for the non-profit organization Random Acts. She holds a master's degree in library science from the University of Maryland, Her research interests include learning, behavior change, and persuasion through new media.

Mega Subramaniam is an Associate Professor at the College of Information Studies (iSchool) at the University of Maryland. She is the Associate Director for the Information Policy and Access Center (iPAC) at the University of Maryland and serves as the co-editor of School Library Research. Her research focuses on enhancing the role of libraries in fostering the mastery of information and new media literacies that are essential to STEM learning among underserved young people. Her work has been funded by the National Science Foundation and the Institute of Museum and Library Services. Mega received her Ph.D in Information Studies from Florida State University and her master's degree in Instructional Systems Technology from Indiana University, Bloomington.Learn more about her research at: https://terpconnect.umd.edu/~mmsubram/

Saba Kawas is a doctoral student at The University of Washington Information School. She holds two master's degrees, one from The University of Washington's College of Engineering and the other from North Carolina State University's College of Design. Her research interests consider how differently-abled and marginalized youth access learning opportunities in the digital age, and how to design tools to support inclusive learning experiences.

Ligaya Scaff is a doctoral student at The University of Washington Information School. Prior to attending the Information School, she was a Social Media Consultant and Community Manager for the University of Pittsburgh Medical Center. She has also served as an Information Literacy Librarian at the State University of New York at Buffalo. Her research interests focus on social media and identity, creative expression within online communities, and the use of digital media in informal learning settings.

Katie Davis is an Assistant Professor at The University of Washington Information School and a founding member of the UW Digital Youth Lab. Her research explores the role of new media technologies in young people's personal, social, and academic lives, with a particular focus on the intersection between technology and identity development during adolescence and emerging adulthood. Katie is the co-author with Howard Gardner of The App Generation: How Today's Youth Navigate Identity, Intimacy, and Imagination in a Digital World (2013, Yale University Press). She holds two master's degrees and a doctorate in Human Development and Education from Harvard Graduate School of Education. Learn more about her research at: www.katiedavisresearch.com

A full-text PDF of this report is available as a free download from: http://connectedlib.ischool.uw.edu/

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Introduction

Connected learning is a powerful educational framework that emphasizes creative and social learning experiences that are driven by learners' personal interests. The framework's core principles include learning contexts that are peer supported, interest powered, and academically oriented along with experiences that are production centered, openly networked, and bring together learners and adults around a shared purpose (Ito et al., 2013). The "connected" in connected learning refers to connecting in-school and out-of-school learning, connecting interests to opportunities, and connecting the learner to peers and mentors. In making these connections across the entire "youth learning ecology" (Martin, 2015), the connected learning framework promotes an equity agenda meant to help close the economic and cultural gaps faced by many non-dominant youth (youth from sociocultural groups who have historically been excluded from institutionalized sources of power) (Braun, Hartman, Hughes-Hassell, Kumasi, & Yoke, 2014; Ito et al., 2013). Success in today's information-based society requires not only access to information, but to the skills and literacy to use information to create value and knowledge (Garmer, 2014). The connected learning framework addresses this need.

As social and technological hubs for their communities, libraries are natural environments to connect learning, creativity, and knowledge production. The Institute of Museum and Library Services (IMLS) and the MacArthur Foundation have recognized this opportunity in their funding and research priorities (Braun et al., 2014; Institute of Museum and Library Services, 2014; MacArthur Foundation, 2015). While libraries are being recognized as ideal environments to promote connected learning opportunities for youth, most of the available literature on connected learning in libraries has been focused on individual case studies; it is therefore not generalizable to libraries of different sizes and capacities, and serving diverse populations (Hill, Proffitt, & Streams, 2015).

Our IMLS-funded project, ConnectedLib, seeks to fill this gap by examining the different types of connected learning that are happening in public libraries across the United States, shedding light on the challenges in facilitating connected learning in libraries, and providing the resources that are needed for teen librarians to implement connected learning successfully at their libraries. Our first step is to bring together and synthesize the existing relevant literature into a single overview—this document. In the following pages, we examine what connected learning is and how it has evolved. We provide examples of connected learning in libraries, discuss opportunities and challenges, and review existing resources for public librarians who wish to implement connected learning principles in their youth programming. We also discuss how the ConnectedLib project plans to address gaps in the existing connected learning research and resources for libraries.

What is connected learning?

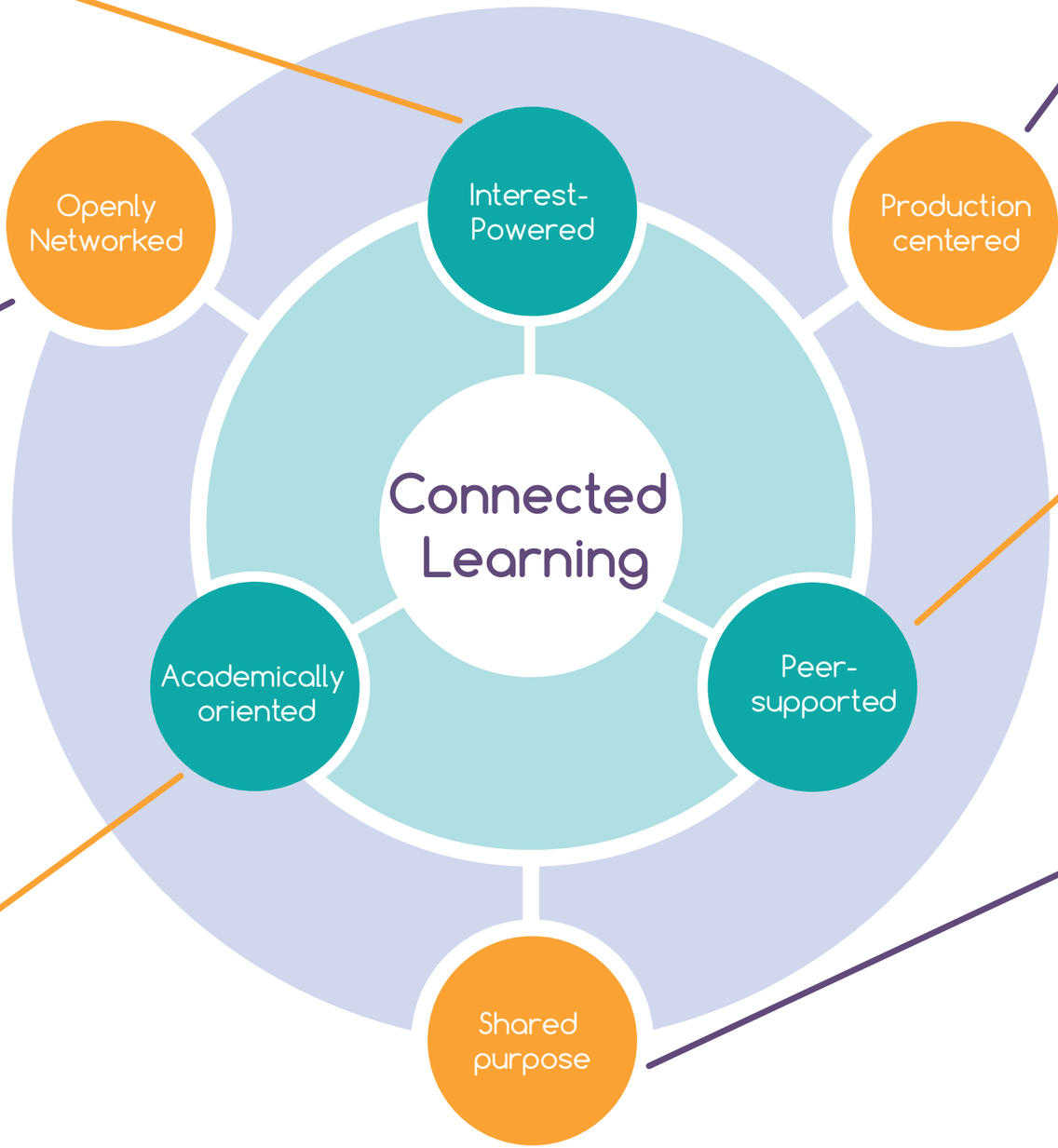
Connected learning is an educational framework that emphasizes learning experiences that are "socially embedded, interest driven, and oriented toward educational, economic, or political opportunity" (Ito et al., 2013, p. 4). Developed by Mimi Ito and colleagues, the connected learning framework involves learning contexts that are peer supported, interest powered, and academically oriented; the core properties of connected learning include experiences that are production centered, focus on a shared purpose, and take advantage of openly networked infrastructures. Connected learning is specifically driven by an equity agenda that focuses on increased opportunities for non-dominant youth (Gutiérrez & Rogoff, 2003; Ito et al., 2013; Jenkins, Purushotma, Weigel, Clinton, & Robison, 2009).

The connected learning framework draws on Ito et al.'s (2010) prior work around "HOMAGO," or "Hanging Out, Messing Around, Geeking Out"—three genres of participation and learning with technology that represent increasingly engaged modes of learning. "Hanging out" describes friendship-driven activities that are focused on connecting and socializing with peers. "Messing around" occupies the middle ground of engagement, where learners are exploring and "tinkering." "Geeking out" represents deep, interest-driven engagement.

Interest-powered refers to learning that is connected to a learner's individual and personal interests and passions. The connected learning framework embraces different levels of interest and engagement, recognizing that allowing youth to "mess around" with a subject can help develop sustained interest, eventually leading to "geeking out."

Building a network of resources outside of but connected to the library context—for instance, visits to non-library spaces, or displaying and publishing work outside of the library—enhances and strengthens learning connections and opportunities within the library. Digital tools and web platforms hold great potential for aiding in the openly networked nature of connected learning. Social media networks like Twitter, Facebook, and YouTube can help learners share work with each other as well as people outside their learning environment. As mobile uses of library resources increase, openly networked learning becomes more important (Horrigan, 2015).

Connected learning underscores the importance of helping learners form connections between their personal interests and academic, economic, or civic opportunities. Programs designed to support academic success, build career-related skills, or increase community or political engagement demonstrate this opportunity orientation.



Producing and creating are critical elements of the connected learning framework. Connected learning lets "gamers become builders, poets become filmmakers, coders become fashion designers, and musicians become engineers" (Institute of Museum and Library Services, 2014, p. 6). Production can be as high tech as 3D modeling or as low tech as a media-free poetry jam.

Peer-supported learning experiences are connected to learners' peer culture and involve sharing and socializing with their peer groups. Learners may be sharing ideas and interests, giving feedback to each other, or simply "hanging out" and "messing around" together (Ito et al., 2010a).

Connected learning encourages cross-generational and cross-cultural groups to collaborate on projects and activities. A shared purpose can be demonstrated through collective goals, competitions, and cross-generational ownership (Larson et al., 2013).

Equity agenda

As the youth population in the United States grows more diverse, it is critical for institutions of learning to evaluate their services to ensure they are meeting the needs of all their patrons. Helping teens develop 21st century skills (Institute of Museum and Library Services, 2015) and literacies can assist in closing the economic and cultural gaps that many non-dominant youth face.

The digital divide in the United States is no longer a simple divide between having access to the internet or not, but a spectrum of digital inclusion (Livingstone & Helsper, 2007). The Pew Research Center reports that only 25% of adults between the ages of 18 and 29 are truly "digitally ready," meaning they have the skills and trust to effectively use digital tools for information and learning (Horrigan, 2016). The equity agenda of connected learning focuses not just on providing access to technology, but also on building skills and competencies that will increase the opportunities available to non-dominant youth (Braun et al., 2014; Ito et al., 2013; Martin, 2016).

Sowing the seeds of connected learning

The progressive education movement, spearheaded in the United States by John Dewey (1897), laid the groundwork for the connected learning framework. Connected learning also draws from a number of different traditions within sociocultural approaches in the learning sciences. Sociocultural learning theory emphasizes the socially embedded nature of cognition and learning and underscores the importance of teacher–student collaboration, experiential learning, peer interactions, and problem-solving activities (Jaramillo, 1996; Vygotsky, 1978). Situated learning theory suggests that learning does not happen in the isolation of the mind, but is a social activity occurring through participation in communities of practice (Lave & Wenger, 1991). Connected learning also has elements in common with the educational theory of constructionism—the idea that humans learn best by building and sharing tangible creations (Ackermann, 2004; Harel & Papert, 1991) .

The development of the connected learning framework grew out of the MacArthur Foundation's research investments in the 2000s. Work with experiential and interest-based, technology-enhanced learning in out-of-school experiences predates connected learning, of course, as illustrated by the Fifth Dimension program that began in the 1980s (Cole, 2006) and the Computer Clubhouse model that was developed in the 1990s (Kafai, Peppler, & Chapman, 2009). After a long and discouraging attempt to work directly with schools to improve learning outcomes, the MacArthur Foundation turned its focus to out-of-school learning in 2004 (MacArthur Foundation, 2015). Beginning in 2005, the Foundation's Digital Media and Learning Initiative funded an extensive three year ethnographic study, headed by Mimi Ito, called the Digital Youth Project (Ito et al., 2008, 2010; MacArthur Foundation, 2005). Under the same initiative (MacArthur Foundation, 2005), the Foundation funded Nichole Pinkard's Digital Youth Network (DYN) (Barron, Gomez, Pinkard, & Martin, 2014), Howard Gardner's research into the ethical dimensions of youth's digital media (James et al., 2009), Henry Jenkins' work on new media literacies (Jenkins et al., 2009), and Joe Kahne's research into civic engagement (Kahne, Middaugh, & Evans, 2009).
All of these youth-focused research agendas informed the development of the connected learning framework.

Ito's Digital Youth Project investigated how youth use new media and emerging technologies in their everyday lives and culminated in the HOMAGO report (Ito et al., 2010). The three genres of youth engagement identified in the report (hanging out, messing around, and geeking out), as well as the distinction between interest-driven and friendship-driven participation, informed the development of the connected learning framework.

Several initiatives and organizations were developed in parallel with HOMAGO and connected learning, varying in structure and purpose but united in their drive to revolutionize traditional learning. For example, the Institute of Play was founded by Katie Salen and other game designers in 2007 in order to study new models of learning and engagement provided by games (Institute of Play, n.d.). The Institute

developed Quest to Learn, a public middle- and high-school based around the principles of game design (Quest to Learn, 2016; Salen, Torres, Wolozin, Rufo-Tepper, & Shapiro, 2011). Another initiative is the Digital Youth Network (DYN), founded by Nichole Pinkard—a technology-rich curriculum and mentorship program that originally encompassed three charter schools in Chicago. It included in-school programs, afterschool programs, and self-directed activities at home all connected by an online platform called Remix World (Ito & Martin, 2013; Barron et al., 2014). DYN was also instrumental in founding the flagship YOUmedia lab at the Chicago Public Library in 2009, with support from MacArthur's Digital Media and Learning Initiative (Ito & Martin, 2013; Mayo, 2013). The YOUmedia lab was the first library space to put the HOMAGO ideas into practice.

In 2009, continuing the work of the Digital Media and Learning Initiative, MacArthur formed the New York City Learning Network. In 2011, the name was changed to the Hive NYC Learning Network and Mozilla took over as the "steward" of the network (Hive NYC, 2016). The Hive model describes three levels of learning infrastructure– one-time learning events, learning communities with regular meet-ups, and organized learning networks that unite businesses and community organizations with learners on a larger scale (Hive Learning Network, 2014). The network has over 50 members and a research arm, the Hive Research Lab (Hive Research Lab, 2013). Other Hives have developed in other areas, including Chicago (Hive Chicago, 2016), Pittsburgh (Hive Pittsburgh, 2016), and Toronto (Hive Toronto, 2016). Hive learning communities can be found even outside of North America in Berlin, Indonesia, and India (Hive Chicago, 2016; Hive India, n.d.).

The Digital Media and Learning (DML) Research Hub was also created in 2009, funded by the MacArthur Foundation, and now promotes research in this area through a series of reports, an annual conference, and weekly webinars. Projects supported by the DML Hub include the Connected Learning Research Network headed by Mimi Ito, the Youth and Participatory Politics network headed by Joseph Kahne, the Connecting Youth: Digital Learning Research Project led by Richard Arum, and the ConnectedLearning.tv website (DML Research Hub, 2016).

In 2012, IMLS and the MacArthur Foundation partnered to offer twenty-four initial "Learning Labs in Museums and Libraries" grants. Several public libraries were among the institutions awarded grants to design their own learning labs modeled after YOUmedia in Chicago (Institute of Museum and Library Services, 2014; Mayo, 2013). MacArthur's Cities of Learning program began in 2013 with a "Summer of Learning" in Chicago that quickly spread to several other U.S. cities (Reconnect Learning, 2014). Online platforms like ExploreChi encouraged youth to explore learning resources in Chicago by providing information and awarding digital badges for completed activities (Digital Youth Network, n.d.). In 2015, the MacArthur Foundation spun off $25 million into a nonprofit called Collective Shift. The organization's first project, LRNG, is building "ecosystems of learning" that connect not only traditional educational institutions like schools and libraries but also businesses, city governments, and other organizations (Herold, 2015; LRNG, 2016a).

The initiatives and support from various parties mentioned above spurred the implementation of connected learning across different communities and learning institutions. Connected learning has grown in popularity across a number of learning environments. It can be found in schools (Ito et al., 2013; Quest to Learn, 2016; Salen et al., 2011), online communities (Carfagna, 2014; Ito et al., 2013; Kow, Young, & Tekinbaş, 2014), juvenile detention centers (LRNG, 2016b), afterschool programs and book clubs (Brough, 2016; Davis & Fullerton, 2015; Kumasi, 2014), and museums and radio stations (Herr-Stephenson, Rhoten, Perkel, & Sims, 2011).

Libraries and connected learning

Modern libraries represent ideal environments for supporting connected learning. They are centers for knowledge creation and sharing, they support self-directed and interest-based learning, and they are inclusive public spaces that bring many different groups together. Once primarily thought of as information providers or repository managers, libraries have undergone a transformation (Braun et al., 2014; Garmer, 2014; Ito & Martin, 2013; Malin, 2012; Valenza, 2008). They are becoming "places to do stuff, not simply places to get stuff" (Williams as cited in Valenza, 2008), shifting "from a repository for materials to a platform for learning and participation" (Garmer, 2014, p. xi). Libraries' growing emphasis on participatory learning—a concept that IMLS sums up as "doing, together" (Hill et al., 2015) —is illustrated by the emergence in recent years of learning labs, Makerspaces, and other library resources and programming that go beyond simply training people how to use library collections. Library spaces like YOUmedia Chicago provide access to creative equipment like video cameras, art supplies, and specialized software, as well as the mentoring and expertise needed to learn how to use them (Larson et al., 2013). This shift makes libraries well suited to promote the creative, production-centered aspects of connected learning.

Libraries have long supported voluntary, interest-driven learning—what Bilandzic calls "free-choice learning" (2016). In contrast to schools—particularly under-resourced, public schools—which may not provide many opportunities for youth to explore their personal interests, libraries can tailor their programs to meet the diverse needs and wants of the young people in their communities (Davis & Fullerton, 2015; Herr-Stephenson et al., 2011). According to the Aspen Institute, public libraries are exemplary public spaces because they strengthen communities and offer resources and experiences to visitors (Garmer, 2014). The public nature of the space means that library programs can bring together people of different ages, backgrounds, and cultures who share similar interests (Bilandzic, 2016), creating what Gee (2004) calls "affinity spaces." These spaces encourage learning that is both peer supported and has shared purpose with others.

Below are notable examples of the trends and innovations in dynamic learning opportunities that are being created in libraries across the globe to support youth in exploring their interests, forming their identities, developing 21st century skills, and learning from peers and mentors. For each example, we call out the salient elements of connected learning.

HOMAGO-ing

Library programming can support all levels of HOMAGO—hanging out, messing around, and geeking out—sometimes at the same time. Providing entry points for people at various skill levels and levels of interest can help teens discover and explore new interests, or strengthen and deepen their skills in established areas of interest.

Offering both one-off and multi-week programs can accommodate different levels of interest. For instance, in 2015 the Houston Public Library offered two video game design classes. A single session class, intended to pique youth's initial interest in game design, used the game Portal 2 to teach participants about the principles behind designing game levels. A multi-week course let participants geek out by designing and developing an entire game of their own (Stout, 2015). [Interest powered, academically oriented, production centered]

Teens interest in fashion were able to geek out by designing and making their own dresses with Providence Public Library in Rhode Island.

Anime clubs, like this one at Kitsap Regional Library, let teens hang out and mess around with art.

The one-room public library in Simla, Colorado, provides low-tech options, like simple Makey Makey kits (JoyLabz LLC, 2016), for exploration and messing around. More sophisticated tools like Arduino boards are opportunities for geeking out. Such tools provide options for patrons of all experience and interest levels, even within a small space (Powell, 2014). [Interest powered, production centered]

Teen volunteers as colleagues

Public libraries are beginning to extend the impact of their teen volunteer programs. Instead of simply focusing on what services the teens can provide, library staff treat the programs as "shared purpose" projects providing mentorship and career development opportunities to teens.

Houston Public Library's summer volunteers are treated like regular staff to help them gain real-world work experience. The teens are also involved in programming and are asked to provide input on the library's offerings for teens (Stout, 2015). [Academically oriented, shared purpose]

Teens' creations are displayed in the windows of Providence Public Library in Rhode Island.

Chattanooga Public Library considers its volunteer program to be a form of workforce development, designed to allow teens to "gain valuable experience before they've even submitted their first job application" (Emery, 2016, p. 30). The program allows interested teens to geek out by designing their own program for other teens, with the mentorship of library staff (Emery, 2016). [Academically oriented, shared purpose]

Members of Kitsap Regional Library's teen intern program play a key role in the BiblioTEC program, a technology program for at-risk youth, and are treated as leaders, not assistants (Barnes, 2016; Kitsap Regional Library, 2014). Interns identify goals they want to achieve during their time at the library—like starting a blog or facilitating a program for teens—and work closely with library staff to achieve those goals (Barnes, 2016). [Academically oriented, shared purpose]

Building technical and professional skills.

Production-oriented programming often connects opportunity (whether academic or economic) with teens' interests. Whether youth are designing fashion, learning to DJ, or creating 3D models, developing professional skills early on can put them in a better position when applying for jobs or colleges.

Salvador Avila, branch manager at Enterprise Library in Las Vegas, turned his personal interest in music into a popular ongoing program for teens aptly called "Learn to DJ." Youth engage their passion for music while learning on professional DJ equipment, and sometimes progress to booking paid gigs. Avila encourages them to spend their earnings on their own equipment to help them establish themselves professionally (Herrera, 2016; Sampson, 2016). [Academically oriented, interest driven, production centered]

The Mix at San Francisco Public Library hosts yearly civic hackathons in partnership with TeenTechSF, a teen-led community group (TeenTechSF, 2016). In 2015, the first year of the hackathon, over 100 people gathered to create solutions to civic problems, such as a website to help people find a place to sleep at night during an emergency and an app that reads Wikipedia articles out loud for people with visual impairments. The projects are then shared on YouTube (TeenTechSF, 2015c, 2015a, 2015b). [Academically oriented, peer supported, production centered, shared purpose, openly networked]

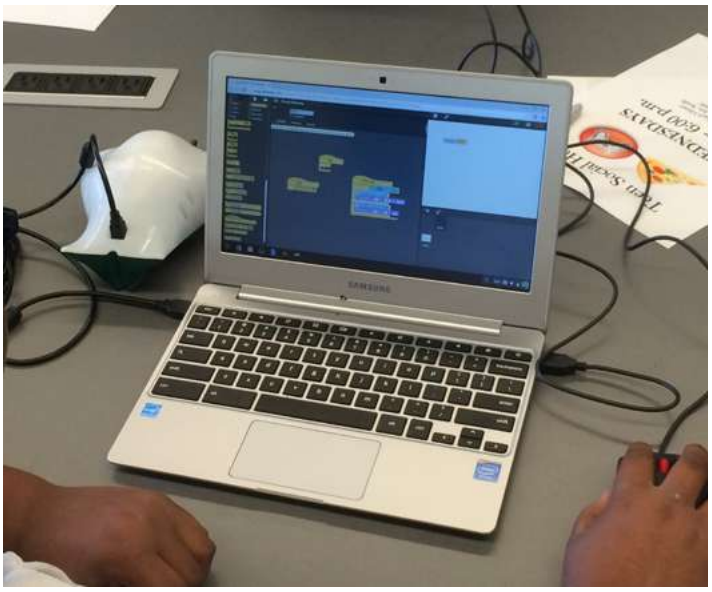
Wilmette Public Library in Illinois leveraged youth's interest in video games to teach them about game design. Younger or less tech-savvy participants could "mess around" using Scratch, and older or more advanced teens could "geek out" using Game Maker. These two programs were specifically designed to promote 21st-century digital literacy skills (Myers, 2008).

Community partners like the Rhode Island School of Design help Providence Public Library connect teens with professionals.

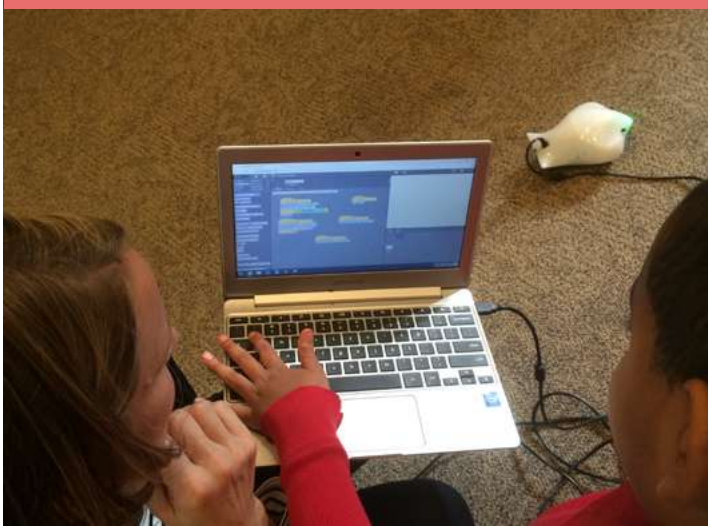
Promoting diversity, equity, & social justice

Connected learning's equity agenda is visible not just in programs specifically designed for non-dominant or vulnerable populations, but also in programs that bring together diverse groups that might not otherwise have the opportunity or inclination to interact.

Since 2011, a community hacker meetup called Hack the Evening (HTE), has met at the State Library of Queensland in Brisbane, Australia. The meetup brings together people from a variety of educational backgrounds, ethnicities, ages, and careers to collaborate informally on personal projects. In particular, the library's welcoming public setting attracted more women and teens than would normally visit the local Makerspace (Bilandzic, 2016). [Shared purpose, peer supported, production centered, interest driven]



Seattle Public Library offers youth access to technology and mentorship.



With funding from Collective Shift's LRNG project, Nashville Public Library is partnering with a juvenile detention facility to bring a digital media creation program to adolescent males, centered around the theme of "Uncaged: How do you define freedom?" When they leave the facility, participants will have developed interests and skills and will have a support network in place (LRNG, 2016b; Morris, 2016; Tognoni & Eidman-Aadahl, 2016). [Academically oriented, production centered, openly networked]

Reaching outside the library

Connected learning emphasizes openly networked connections outside of traditional learning spaces. Libraries can help forge those connections through social and digital media, through peer culture and teens' social lives, and by finding new audiences and outlets for youth's creative work.

The Digital Youth Network created a closed social network platform called "Remix World" (now called iRemix) to allow youth and mentors to engage each other in discussions about lessons and projects in an out-of-school context similar to the regular social networks the youth were accustomed to using (Zywica, Richards, & Gomez, 2013). [Openly networked, shared purpose, peer supported, academically oriented]

Kumasi (2014) tied peer culture into the Young Urban Scholars Book Club by asking participants to connect concepts from readings to "texts" from their own lives, like YouTube videos or song lyrics, and share them with the group. Video clips from popular African-American media figures like Dave Chappelle made abstract concepts like reparations more accessible to youth. [Peer supported, openly networked, academically oriented, interest driven]

Library of Games was a podcast and blog sponsored by YOUmedia Chicago. Content was created by Chicago high schoolers using YOUmedia's media production resources. The program morphed into a teen-driven Let's Play and tournament livestreaming program (Chicago Public Library, 2015, 2016). [Production centered, openly networked, interest driven, peer supported, shared purpose]

Providence Public Library partnered with Nordstrom to help teens explore fashion- and design-related career options.

Implementing connected learning in libraries: Opportunities and challenges

Library staff across the United States have encountered both opportunities and challenges while introducing connected learning in their libraries, from building relationships and finding professional development opportunities, to working around resource limitations and communicating the value of this new vision of youth programming. Below we discuss the opportunities that librarians have to truly embrace connected learning and the challenges they and other connected learning stakeholders face in planning and implementing connected learning activities and programming. When challenges are presented, we also share strategies that were used to mitigate and solve problems.

Building relationships with learners and partners

Reflecting its sociocultural roots, connected learning encourages building relationships—relationships among learners, between learners and experts or mentors, and between learners and people outside the learning context. Herr-Stephenson et al. state that

> *"in every example of afterschool programs using digital media and technology, human relationships prove more fundamental to the organization than the technological tools, whether they are mentoring relationships between adult staff members and youth or as peer relationships between participants"*(2011,p.35).

In this section, we discuss opportunities for developing positive relationships among diverse stakeholders, including librarians, youth, and community partners, and reflect on specific challenges that librarians face in their efforts to cultivate such relationships.

Adults who are "guides" and "collaborators," rather than instructors, are critical for engaging youth in rich learning opportunities (Austin, Ehrlich, Puckett, & Singleton, 2011). Personal relationships between individual library staff members and patrons can influence the success of library programming. A personal invitation to a program or event can have a greater impact than traditional marketing efforts (Larson, 2014).

It can be difficult, however, for mentors and staff to strike the right balance between peer or collaborator and authority figure as they enforce appropriate rules of conduct for teens and policies for use of the teen space and materials (Austin et al., 2011; Sebring et al., 2013). Additionally, building relationships with teens requires flexibility and responsiveness that may be difficult for some library staff (Austin et al., 2011). Mentors must be willing to be co-learners exploring new

topics and skills alongside youth, enhancing peer-supported learning by acting as peers themselves (Martin, 2015).

Mentors at the Digital Youth Network are encouraged to treat every interaction with youth as a chance to support their digital literacy development (Barron et al., 2014) One way to start building relationships with teens even early on in a library's process of implementing connected learning principles is to involve teens in the planning and design of youth-focused programming (Institute of Museum and Library Services, 2014). Librarians and other library staff can talk to youth individually, leveraging a teen advisory board or teen volunteers, and conduct surveys of youth patrons to develop a full picture of youth interests and needs (Martin, 2015; Mayo, 2013). Volunteer or even internship positions, whether as part of an advisory board or some other role, can provide deep learning experiences for a smaller number of teens (Stout, 2015). Cooperative inquiry techniques can facilitate collaboration between youth and librarians, and also demonstrate how participatory design can be a form of connected learning itself (Martin, 2015; Subramaniam, 2016).

The relationships between library staff and entities outside of the library that are invested in the learning process are also important to the success of connected learning programs. Partnerships with government agencies, schools, local businesses, or community organizations and non-profits can play a key role in expanding the variety of services that a library offers its patrons, and particularly in connecting teens with learning and mentorship opportunities in their areas of interest (Larson, 2014; Mayo, 2013; St. Paul Public Library, 2015; Struck, Staloch, Kirschmann, McGhie, & Vue, 2014; Turner, 2013). Mentoring programs (run by the library or facilitated by a community partner) can connect interested youth to professionals in specialized areas like fashion design or sound recording, providing expertise beyond what library staff can provide on their own (Larson, 2014; Turner, 2013). Mentors can also help youth navigate the information overload of online resources in their interest area (Rafalow & Larson, 2014; Subramaniam et al., 2015). The library's role in connecting youth to knowledge and opportunities through mentors can be thought of as "brokering" learning (Ching, Santo, Hoadley, & Peppler, 2015). Such community partners can participate and contribute to the professional development activities that further build the capacity of librarians in certain areas (St. Paul Public Library, 2015; Turner, 2013). Partners can also provide resources for connected learning programs, such as space for mobile learning labs or Makerspaces (Stout, 2015).

Building and sustaining partnerships with outside partners is not effortless; it can be challenging to initiate and sustain ongoing communication with partners when their norms and terminology are different than those of a public library (Mayo, 2013). Chicago Public Library and the MacArthur Foundation developed several best practices to consider when they were choosing partners for the first YOUmedia lab: a good partnership is one that is mutually beneficial to both organizations; the partners must agree on a shared vision; and both must be willing to be flexible and innovative in order to take full advantage of the partnership (Austin et al., 2011). Professional development opportunities *(discussed in the next section)* that involve partners alongside library staff can help create and solidify a shared vision between organizations (Larson, 2014; Larson et al., 2013).

Professional development for connected learning

Connected learning demands new competencies from youth-serving librarians that graduate programs in library and information science do not always provide, and may require a shift in thinking for some librarians and outside partners. Four categories of interrelated knowledge and skill sets emerged in recent reports and literature describing the nature of skills and abilities that librarians must have to promote connected learning among youth. First, they must be ready and willing to transition from expert to facilitator, engaging in active and continuous learning with teens and for teens and embrace new ideas of what teen spaces and services should be (Braun et al., 2014; Hill et al., 2015). Secondly, youth librarians need to apply interdisciplinary approaches to establish equal partnership and learning opportunities that facilitate discovery and use of digital media (Arup University, 2015; Bertot, Sarin, & Percell, 2015; Garmer, 2014; Hill et al., 2015). Third, they should be able to develop dynamic partnerships and collaborations that reach beyond the library into their communities (Braun et al., 2014). Finally, they should be able to evaluate connected learning programs and utilize the evaluation results to strengthen learning in libraries (see the following section on measuring and communicating impact) (YALSA, 2010). To address these needs, individual library systems, library and information science schools, professional organizations, and non-profits have been working to develop relevant training for pre-service librarians and continuing education opportunities for in-service librarians.

Individual library systems may create in-house professional development programs based on a specific need of the system. For example, the Saint Paul Public Library found it critical for staff and partners to understand and accept the HOMAGO model of youth learning and participation (Larson, 2014). Together with their main partner, the Saint Paul Parks and Recreation department, they began to describe their spaces as "calm, creative, and active zones" instead of as "library" and "recreational" zones (Institute of Museum and Library Services, 2014). A professional development program focusing on managing the library's teen programs and the digital learning lab helped staff from both the library and the Parks and Recreation department develop the skills they needed to serve their youth patrons effectively (Larson, 2014).

The Digital Youth Network (DYN) created a professional development program for their mentors, recognizing that expertise in a technical area may not be accompanied by expertise in teaching and relating to youth. Even within their field, DYN mentors also have access to workshops to build their technical skills. DYN professional development workshops are often led or co-led by other DYN mentors (Barron et al., 2014). At YOUmedia Chicago, DYN included library staff in professional development programs for mentors, resulting in the youth making no distinctions between library staff and official YOUmedia mentors (Larson et al., 2013).

After entering the workforce, librarians and library staff need continued support and development (Larson, 2014; Stout, 2015). Library staff should be able to "get their own hands dirty" with the same learning tools that will be used in their programs, allowing them to have the same kind of participatory learning experiences that they will provide their patrons (Hill et al., 2015, p. 6).
To help in-service library staff continue learning, professional organizations such as the Young Adult Library Services Association

(YALSA) have offered connected learning-related webinars discussing connected learning in the context of summer reading programs (Luetkemeyer, n.d.), library–museum partnerships (Twiggs, 2016), and designing teen spaces (Velásquez & VanOrsdel, 2016). The ConnectedLearning.tv website (2016), originally developed by the Digital Media and Learning Hub, provides a number of webinar series that cover a wide variety of topics, from the specific ("Minecraft in Education") to the more high-level ("The Future of Education"). Managed by the National Writing Project, the YOUmedia community of practice at http://youmedia.org/ is a platform for librarians, museum workers, researchers and other educators to discuss connected learning and how to implement it in their institutions (YOUmedia Network, n.d.). The site also provides a toolkit for organizations that are interested in developing learning labs (National Writing Project, 2015).

William Penuel developed a free and open online course on the evaluation of connected learning programs (2016). Looking forward, a formal educational experience will soon be available at the College of Information Studies at the University of Maryland (funded by IMLS), where an online post-graduate certificate program in youth experience will be offered with the ultimate goals of developing the needed skills for in-service librarians to work with-youth-for-youth, to facilitate design thinking projects, and to be able to build and sustain strong community partnerships that enhance their connected learning programs and offerings. The first cohort will begin in the fall of 2017 (Subramaniam, Clegg, Jaeger, & Waugh, 2016).

Overcoming resource limitations

Resource limitations, particularly space and funds for technology, represent a persistent challenge in libraries. Dedicated teen spaces facilitate "hanging out" and "messing around" by being more comfortable and social than the rest of the library (Herr-Stephenson et al., 2011; Yoke, 2016), but many libraries do not have a teen space or the ability to create one in every (or any) branch. Some libraries lacking a dedicated teen space, or with too many branches to accommodate extensive space and technology configurations, create mobile learning labs or Makerspaces (Larson, 2014; Powell, 2014; Stout, 2015). Mobile experiences not only save space, they can also help take the library to new contexts like senior centers, schools, or underserved neighborhoods (Hill et al., 2015; Mayo, 2013).

Teen spaces must serve a variety purposes, and libraries should not feel that they need to conform to a "correct" configuration. In the Learning Labs program, for instance, the spaces were highly individualized and specific to each library and museum context—the important elements were the "ways of thinking, behaving, and working that emerge within [the space]" (Institute of Museum and Library Services, 2014, p. 12). Even the four Createch spaces of the St. Paul Public Library in Minnesota are unique in response to the individual needs, challenges, and neighborhoods of each branch (Struck et al., 2014).

Chicago Public Library identified five different types of teens in YOUmedia, each with their own way of using the spaces in the library. Socializers connected with friends and spent the most time in the gaming and performance areas. Readers/studiers congregated to the study areas, the stacks, and the front desk. Experimenters worked in the computer areas, while creators took advantage of the workshops, production studio, and performance areas. Floaters tended to use several different spaces for different purposes on a single visit (Sebring et al., 2013).

Although these are certainly predictable uses for teen spaces, Velásquez (2016) cautions against making assumptions and strictly defining the expected use of teen spaces before seeing how teens actually behave in them. Velásquez recommends creating "flexible" and "neutral" spaces that will allow teens to determine the best way to use them at any given moment (2016, p. 31).

There is also often a misconception that connected learning must involve expensive or cutting edge technology. Although many connected learning programs focus explicitly on technology and related digital literacy skills, others use technology as a supporting resource in a program with a non-technological focus (Herr-Stephenson et al., 2011; Rafalow & Larson, 2014). Even technology-related skills like design thinking can be learned using low- or no-tech methods. The process of researching, planning, prototyping, and testing can be learned with duct-tape wallets just as effectively as it can be with Scratch games or Lego robotics (Braun, 2016). Similarly, an introduction to architecture can be taught by physically measuring the library space and drawing it on paper rather than using expensive software like SketchUp and Photoshop (Davis & Fullerton, 2015). The tools developed by the HackHealth project help youth learn to research health information with resources found in any library (HackHealth Program, 2014). In partnership with IMLS, Kitsap Regional Library in Washington is developing a "roadmap" and "playbook" to help libraries of all sizes and resource levels develop effective STEM programming (Kitsap Regional Library, 2015).

Librarians should not allow their vision to be hampered by resource limitations. Thinking big can allow planners to consider all the possibilities before them and possibly identify new innovations or workarounds. Many libraries are able to develop new programs and spaces by sharing their goals in proposals to funders (Kepple, 2013; Powell, 2014). As Jamie Mayo of the Kansas City Public Library in Missouri says:

> *"We have to think bigger, create a compelling program unhampered by thoughts of limited funds, and share these visions with funders who can appreciate the importance of what we expect to accomplish"*(Mayo, 2013, p. 33).

Measuring the impact of connected learning programs

Capturing the impact of connected learning programs is vital for program designers, library administrators, and funders (Hill et al., 2015). Yet, connected learning presents challenges for traditional measures of impact. Library success, like academic success, has traditionally been measured quantitatively, such as documenting the number of children participating in a summer program and its impact on their reading and writing scores (Dynia, Piasta, Justice, & Columbus Metropolitan Library, 2015). The impact of an out-of-school connected learning experience may not be well captured in the number of attendees or via test scores (Hill et al., 2015; Kumasi, 2014). By definition, connected learning takes place across multiple environments, not just the library, so libraries must learn how to define "success" in a way that reflects the learning that youth are taking home or to school with them (Ito & Martin, 2013). Additionally, parents can only comprehend the power of connected learning programs when the value of such programs is communicated in a way that resonates with them. Past research has documented that parents are known to perceive out-of-school experiences that are not explicitly linked to

learning standards as not valuable to their children's academic or professional prospects and therefore not worth their children's time when they have competing activities (Herr-Stephenson et al., 2011; Kumasi, 2014).

One of the challenges in communicating the impact of connected learning programs stems from unclear or broad goals set during the initial conception phase of such programs. For instance, overly broad and undefined outcomes posed a problem early on for YOUmedia Chicago when planning for assessment (Austin et al., 2011). To make assessment easier and more meaningful, YOUmedia now measures clearly articulated "social and relational outcomes" of their programs like the relationships developed by youth, and how they connected their interests to concrete opportunities such as being invited to write for Huffington Post or developing a photography portfolio to supplement art school applications (Larson et al., 2013; Sebring et al., 2013). Larson et al. (2013) also point out that connected learning outcomes can and should be evaluated at both the individual and collective levels.

In recent years, the eagerness and urgency to document the impact of connected learning programs has resulted in the use of many types of specialized evaluation tools. Programs that aid deeper learning may have a larger impact but with fewer attendees than other programs. Defining success outside of attendance numbers represents a new, potentially challenging way of thinking for many librarians (Powell, 2014).

However, broadening one's set of evaluation strategies has the potential to communicate more powerful impacts, as in the case of a YOUmedia Chicago participant whose writing skills improved dramatically after he started to blog about the video games he played in the library (Austin et al., 2011). IMLS recommends carefully planning qualitative assessments for the transformative impact of participatory and connected learning programs (Hill et al., 2015).

Quest to Learn, the connected learning-based school, uses rubrics, observations, interviews, interpretive representations, discourse analysis, and games as assessment tools (Flatt, 2014; Salen et al., 2011). The DML Research Hub has developed a series of assessment tools designed to capture and document learning that happens in connected learning programs. The surveys and questionnaires, which are designed to be modular and can be used together or piece by piece, measure how well programs implement connected learning principles, how youth experience interest-based activities, what youth experience in programs, and the outcomes of the programs (Maul et al., 2016; Penuel, Van Horne, et al., 2015; Penuel, Dadey, & Van Horne, 2015; Van Horne, Penuel, & Michalchik, 2015a, 2015b). Additionally, researchers have started developing in-house and more targeted connected learning evaluation tools such as the pre and post-program interviews that are administered to HackHealth (an afterschool health literacy program) participants (HackHealth, 2014).

At the time of writing, William Penuel, Mimi Ito, and colleagues from YALSA and the DML Research Hub are working on an IMLS-funded project called Capturing Connected Learning in Libraries. The project will develop tools and methods for the documentation, evaluation, and assessment of connected learning programs in libraries (Ito, Mack, Michalchik, Podkul, & Yoke, 2016).

How the **ConnectedLib** Project will help

In light of the current landscape of connected learning literature and resources, the ConnectedLib Project will address three main needs. First, it will add to the research in the fields of digital media and learning and library and information sciences. Existing literature involving youth, technology, and libraries is primarily anecdotal in nature, focusing on particular programs or advice for practitioners (Herr-Stephenson et al., 2011; Hill et al., 2015). IMLS emphasizes the importance of integrating research and practice more closely instead of simply focusing on case studies (Hill et al., 2015). Addressing this need, the ConnectedLib team conducted interviews and focus groups in 2015–2016 with over 80 teen librarians and youth-serving library staff nationwide from libraries of all sizes in urban, suburban, and rural areas. Our analysis of these interviews and focus groups identified librarians' challenges and needs in developing connected learning programs for their teens—even if they do not think of their current programming in connected learning terms.

Second, using the insights from this research, the ConnectedLib project will develop and disseminate a scalable set of resources for teen librarians to help them learn about connected learning principles and apply them to their programs, regardless of their library's budget or size. The end product will be a set of free, online modules that will provide continuing education units to public library staff who work with teens.

Conclusion

Connected learning is an innovative framework for designing learning experiences that are creative, social, and engaging, and are particularly suited for addressing social inequity in today's youth. As public and informal learning spaces that are already embedded in their communities, libraries are well positioned to be excellent sites for connected learning. Many public libraries in the United States have begun to incorporate connected learning into their services and even their spaces for youth, but adoption of the framework is not yet widespread.

The purpose of this white paper was to synthesize what is known about connected learning and libraries, and collect examples and trends around what libraries are currently doing with connected learning. We also identified existing challenges and gaps in the knowledge and research surrounding connected learning in libraries. Finally, we showed how our ConnectedLib project, introduced in the last section, will address these challenges and gaps in an effort to support and promote connected learning in libraries across the country and beyond.

KEY PUBLICATIONS

If you'd like to learn more about connected learning and its role in youth services in public libraries, we recommend the following resources:

Hanging Out, Messing Around, and Geeking Out: Kids Living & Learning with New Media.

Mizuko Ito et al. The MIT Press, 2010.

The MacArthur Foundation's Digital Youth Project culminated in this ethnographic report of young people's use of new media. The report Living and Learning with New Media: Summary of Findings from the Digital Youth Project (Ito et al., 2008) provides a condensed summary of the findings reported in the longer publication.

Quest to Learn: Developing the School for Digital Kids

Katie Salen, Robert Torres, Loretta Wolozin, Rebecca Rufo-Tepper, and Arana Shapira. The MIT Press, 2011.

Although it describes the context of an elementary school, this book provides an in-depth look at developing engaging programs using game-based learning.

Connected Learning: An Agenda for Research & Design

Mizuko Ito et al. DML Hub, 2013.

This is the most fundamental resource on connected learning, defined as "learning that is socially embedded, interest-driven, and oriented toward educational, economic, or political opportunity." It includes several case studies and describes the learning contexts, experiences, and environments that make up the connected learning framework.

Connected Learning and the Future of Libraries

Mizuko Ito and Crystle Martin. In *Young Adult Library Services*, Fall 2013

Summarizes a series of webinars and discussions held between YALSA and ConnectedLearning.tv in May 2013, specifically focusing on connected learning in libraries. They discuss how teens should be given guidance and support on how to use the technology they have access to at the library, and how conversations need to focus more on learning and less on technology.

Safe Space and Shared Interests: YOUmedia Chicago as a Laboratory for Connected Learning

Kiley Larson et al. DML Hub, 2013.

Covers the history of YOUmedia Chicago, including several case studies, a discussion of outcomes and goals, and detailed profiles of five library programs.

The Digital Youth Network: Cultivating Digital Media Citizenship in Urban Communities

Brigid Barron, Kimberly Gomez, Nichole Pinkard, and Caitlin K. Martin. The MIT Press, 2014.

Recounts the history and development of DYN, including several case studies and implications for future research and program design.

ConnectedLearning.tv

This resource from the Digital Media and Learning Research Hub and their spin-off project, the Connected Learning Alliance, houses a large number of webinars on the topic of connected learning, ranging from specific applications to high-level concepts.

The Future of Library Services For and With Teens: A Call to Action

Linda W. Braun, Maureen L. Hartman, Sandra Hughes-Hassell, Kafi Kumasi, & Beth Yoke. YALSA, 2014.

A YALSA and IMLS report that begins by arguing that library services for teens are endangered by budget cuts, yet are more important than ever, both due to changing demographics (such as ethnic diversity and the number of children living below the poverty level), social problems like cyberbullying, and rapidly changing technology and information literacy requirements for the modern workplace. The report moves on to describe a "paradigm shift" for libraries, which need to engage more dynamically with teens to serve their broader and deeper needs. The "equity agenda" of connected learning can help libraries address these needs.

IMLS Focus: Learning in Libraries

Chrystie Hill, Merrilee Proffitt, and Sharon Streams. IMLS, 2015

Synthesizes the presentations and discussions from a May 2015 forum hosted by the Institute of Museum and Library Services (IMLS) to discuss the themes that make up their current funding priority, "Learning in Libraries." It includes sections on participatory learning, early learning, creating bridges from practice to research and back, and digital literacy and inclusion

On-ramps, Lane Changes, Detours and Destinations: Building Connected Learning Pathways in Hive NYC through Brokering Future Learning Opportunities

Dixie Ching, Rafi Santo, Chris Hoadley, and Kylie Peppler. Hive Research Lab, 2015

Presents Hive NYC as a program that "brokers" learning by connecting youth to knowledge, mentors and opportunities, with a focus on building relationships with youth.

Designing the Library of the Future For and With Teens: Librarians as the "Connector" in Connected Learning

Mega Subramaniam. In *Journal of Research on Libraries and Young Adults*.

Describes several ways that librarians can leverage cooperative inquiry techniques to develop connected learning programs for teens, emphasizing non-dominant youth and the perspective of Radical Change theory.

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helping librarians use digital media to make learning connections with youth

ConnectedLib is helping librarians incorporate digital media into their work with youth to promote connections across learning contexts. We are teaming with public libraries to create professional development resources that support librarians in their efforts to leverage new media technologies and promote youth's connected learning experiences in libraries. With the help of our public library partners—Providence Public Library, Seattle Public Library, and Kitsap Regional Library—we are creating a suite of professional development resources aimed at building librarians' capacity to engage and promote connected learning and 21st century skills among today's digital youth.
To learn more, visit us on the web at http://connectedlib.ischool.uw.edu/

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COLLEGE OF
INFORMATION
STUDIES

4105 Hornbake Building, South Wing
College of Information Studies
University of Maryland College Park
College Park, MD 20742

Mary Gates Hall, Ste. 015
Digital Youth Lab | Information School
University of Washington
1851 NE Grant Ln, Seattle, WA 98195