

Capturing Connected Learning in Libraries (CCLL)

The CCLL project is a unique collaboration between researchers and practitioners advancing the implementation and understanding of connected learning in libraries—learning that leverages digital resources and is participatory, socially connected, interest-driven, and oriented towards educational opportunity. It addresses two research questions: What are appropriate learning outcomes of connected learning programs in libraries, and how can we measure them? What evaluation tools and practices can best support the development and improvement of connected learning spaces and programs in libraries?

Unlike a traditional research study, this project addresses these research questions by bringing researchers and practitioners together in a collaborative team to develop and pilot evaluation tools. It will inform the field of evaluation research by providing robust case studies of participatory evaluation, advancing our knowledge of connected learning outcomes and effective evaluation approaches for library settings. In tandem with developing these research findings, the project will also produce tools, guidelines, professional development resources, and case studies for practitioners and evaluators to use in evaluating and improving their connected learning spaces and programs.

1. Statement of Need

Libraries across the country are remaking spaces and programs to meet growing demand for digital and interactive content, and educational programming that promotes creativity, “making,” and broadened notions of literacy. These changes reflect a paradigm shift not only in the design of libraries and the roles of library professionals, but also in how libraries document and evaluate their effectiveness. The Capturing Connected Learning in Libraries (CCLL) project addresses the urgent and growing national need for evaluation approaches that reflect a new emphasis in libraries on digital, networked, and production-centered content, spaces, and programming.

The 2015 Pew Research Center report, *Libraries at the Crossroads*, describes the continued importance of libraries for the majority of Americans, particularly for lower income and minority families, to access digital and informational resources. At the same time, declining patronage by teens and young adults underscores the need for libraries to adapt to a changing technology landscape. Patrons are seeking spaces for community-oriented, educational, and creative activities, particularly those that develop digital literacy (Horrigan, 2015).

The Young Adult Library Services Association (YALSA) report on the Future of Libraries also argues that libraries and youth services must reimagine themselves as places where youth can access apps, experts, and educational programming in addition to the traditional offerings of books in quiet spaces. Library professionals are reshaping their programs to serve teens and young adults who “must be able to read, write, and interact across a range of platforms, tools, and media from signing and orality through handwriting, print, TV, radio, and film, to digital social networks” (Braun et al., p. 4). Both of these reports reflect a broad consensus that library spaces and services need to embrace social, creative, and digital programs and spaces that serve the information and educational needs of a rising generation, particularly for underserved youth.

While the national dialog and IMLS funding priorities reflect a growing consensus about how libraries must change, the tools for evaluating the effectiveness of these new offerings have lagged behind. “Public libraries...must move from documenting outputs, like the number of attendees at a particular program, to identifying outcomes—concrete and measurable changes for the teens participating” (Braun et al., p. 22-23). While library professionals have access to goals and guidelines for *designing* programs (e.g., YALSA teen programming guidelines 2015), such guidelines are helpful but insufficient for *evaluating* programs. Measuring learning outcomes for youth participating in these programs is particularly challenging. Learning outcomes measures,

whether for traditional or “21st century skills,” have generally been developed for in-school settings and do not always map onto library offerings. Even toolkits and approaches that have been developed for out-of-school programs tend to reflect a structured, educator-driven approach (e.g., Harris, 2011) that is not tuned to library patronage, which is often drop-in and interest-driven. Libraries lack evaluation tools, moreover, that are tailored to their unique strengths as knowledge hubs and access points for learner-centered and inquiry-driven learning. As libraries adopt new approaches to engage today’s youth (Braun et al., 2014; Ito et al., 2013; Penuel et al., 2015), they also need new ways to describe and improve services and document learning outcomes.

The Connected Learning Research Network (CLRN) is an interdisciplinary, cross-university group, established in 2011 and funded by the MacArthur Foundation, to conduct research in support of progressive and equitable educational technology adoption. The network’s work centers on connected learning—learning that is participatory, socially connected, interest-driven, and oriented towards educational opportunity. CLRN research has documented how wealthier families are increasingly investing in informal, interest-focused and digitally-supported learning, and has looked to libraries as a site for providing these kinds of opportunities for lower-income families. The connected learning approach is particularly well suited to library settings because of their emphasis on open access, inclusion, and informal, youth-driven learning. The YALSA *Future of Library Services* report describes the connected learning approach as “at the core of library services for and with teens. Connected learning provides a foundation for what teens need and want from libraries” (p. 10). Library spaces and programs designed around connected learning principles (1) are centered on youth interests and initiative, (2) engage participants in making and production, and (3) support social activity and relationship-building around shared projects and purpose. In addition, connected learning programs seek to leverage digital production tools and online networks in order to make creation more accessible and to amplify visibility and impact.

IMLS, the MacArthur Foundation, and other funders have made substantial investments in supporting the development of connected learning *spaces* and *programs* in libraries. The YOUmedia Learning Lab network exemplifies the efforts to develop *spaces* for connected learning, and is part of a larger movement to establish maker spaces and other production-oriented spaces in libraries. The first YOUmedia Learning Lab opened in 2009 in the Harold Washington Library in Chicago, and was inspired by Ito’s research which described different genres of youth new media practices as “Hanging Out, Messing Around, and Geeking Out’ (HOMAGO) (Larson et al., 2013). A set of five expansion sites soon followed. IMLS and MacArthur later partnered to support the planning of HOMAGO-inspired YOUmedia spaces to support connected learning in twenty-four libraries and museums across the country (ASTC, 2014), expanding the network to over 30 institutions. YOUmedia Learning Labs offer youth-focused spaces, digital tools, and expert mentors for youth to engage in digital media production and informal learning. Expanding its support role for the first five YOUmedia Learning Labs, National Writing Project (NWP) has taken up the continuing task of professional development and community building for this emerging YOUmedia network.

In addition to the investments libraries are making in dedicated spaces for connected learning, libraries have also been developing connected learning *programs* which can operate in a wide range of settings including YOUmedia centers. The Los Angeles Public Library’s “Full STEAM Ahead” initiative is one example of this kind of programmatic focus. By developing curriculum and program materials, Full STEAM Ahead supports hands-on science, technology, and arts programming across the LAPL system. Attention is spent on ensuring that these programs can be offered in diverse settings with different levels of staffing, space, and resources. This initiative provides a window into connected learning programming across a large library system that serves a wide range of communities, and is thus a useful complement to the YOUmedia effort which

centers on flagship digital learning labs. See supporting materials for more background and case studies on connected learning in libraries.

Led by leading specialists in assessment and evaluation in informal settings, CLRN has developed and tested instruments for measuring connected learning that can be used for both improving services and demonstrating their value. This work has focused on examining experiences that cross settings, but not on features of specific programs (<http://researchtools.dmlhub.net>). Libraries need evaluation resources that help develop and improve their connected learning programming and document the critical outcomes for youth participants. Such resources should be adaptable to reflect the variations in program populations (e.g., youth of different ages and backgrounds), focus (e.g. digital arts, programming), and lengths (e.g., pop up, drop in, longer term). The development of these resources through a collaboration between CLRN researchers and library practitioners will provide new possibilities for improving and expanding connected learning programs. Our research questions are: (1) What evaluation tools and practices can best support the development and improvement of connected learning programs in libraries? (2) What are some appropriate learning outcomes of connected learning programs in libraries, and how can we measure them?

2. Impact

This project will support an urgent need for evaluation that specifically targets emerging connected learning practices and accelerates the development, improvement, and spread of connected learning in libraries, thereby advancing the IMLS strategic priority, “Learning in Libraries.” The project will result in (1) measures, evaluation tools, and approaches tailored to contemporary library spaces, (2) producing evidence-driven case studies of effective designs and practice, and (3) relationships and shared practices that connect evaluation researchers and library practitioners.

1) The project’s primary and most immediate impact will be in supporting and improving effective evaluation practice in libraries, with a focus on youth library services and spaces. We expect the following outcomes:

- Evaluation plans tailored to serve the needs of librarians developing connected learning spaces and programs. Building on the connected learning and program design principles outlined in the 2014 YALSA *Call to Action*, these will include:
 - Observational and program review instruments that highlight the key components of connected learning environments
 - Examples of program features and strategies for enacting those features
 - Scales for measuring youth outcomes aligned with the key features of programs
 - Sample evaluation plans for conducting evaluations in specific programs
- Professional development resources and recorded webinars for capacity building.
- Evaluation tools and professional development resources will be disseminated through existing librarian-centered sites, events and networks maintained by YALSA and NWP.

2) This project will also develop case studies of evaluations of library spaces and programs. The cases will provide the tools, plans and resources used, and explain how they were linked to the design and testing process. The cases will include spaces that are designed to support activities across the HOMAGO spectrum, and how specific features support different forms of engagement. Other cases will focus on the programs that are offered in both HOMAGO spaces as well as in more varied settings, and how practitioners conducted evaluations of program outcomes. An example of a related approach can be found at:

<http://researchandpractice.org/how-to-kick-off-a-collaborative-design-process/>.

3) The project will also model and develop guidelines for effective researcher-practitioner collaborations with out-of-school educational programs. The project will draw from participatory evaluation approaches of prior studies (Bevan et al., 2015; Lemke et al., 2015; Penuel et al., 2015; Remold et al., 2013) in order to develop participatory evaluation guidelines which can be tailored to a range of library-based connected learning programs. We know from prior work that research-practitioner collaborations work by building on problems practitioners face, finding a shared focus for mutually addressing the problems, and conducting inquiry on programs for the purpose of improving them. For example, STEM-oriented maker programs have benefitted from these types of partnerships to scale more effectively by identifying important learning outcomes, ways of recognizing whether those outcomes are being achieved, and means of designing and replicating programming to focus on supporting such outcomes. By developing guidelines tailored to the specifics of connected learning in library settings, this project will enable practitioners and evaluators to more effectively collaborate and achieve impactful outcomes.

The CCLL project will amplify the impact for library professionals and researchers through:

- Training and professional development for researchers for effective evaluation of connected learning programs in libraries. CCLL co-PI Bill Penuel is teaching a class on evaluation for connected learning at CU Boulder and as an open online course for practitioners. This course will be a platform for ongoing researcher/practitioner engagement with this project.
- At least one journal article or report describing the key aspects of effective collaboration between evaluation researchers and libraries for supporting connected learning spaces and programs.
- YALSA and NWP will sustain the dissemination and renewal of this project's outcomes through their ongoing blogs, webinars, discussion sites, and events. Library professionals engaged in connected learning are already actively sharing their tools, tips, and lessons learned through the community discussions and webinars on the YALSA website, and the NWP hosted Educator Innovator and YOUMedia Community of Practice sites. We expect that the project outputs would be part of this ongoing community conversations.

Evaluation Plan: Progress towards project goals and effectiveness of the resources will be evaluated through:

- CU Boulder will assess whether the instruments and tools developed in this project match up with a representative set of common objectives and needs for resources among funded library programs.
- Feedback from librarian partners collected at project meetings and at the workshops in Y1 and Y2. We will also conduct surveys and interviews in Y2 and Y3 of YALSA members, LAPL librarians and the YOUMedia community in order to determine degree of uptake and value that the project outputs are providing.
- Metrics on the spread and uptake of the evaluation tools, case studies, and professional development workshops and materials. These numbers will be collected via online metrics and short surveys triggered when people download resources from the YALSA and NWP sites.
- Beth Yoke from YALSA and Elyse Eidman-Aadahl from NWP will take the role of evaluation advisors in order to provide feedback on the effectiveness of our practitioner partnerships and progress toward our goals.

3. Project Design

Project Approach and Methods

This project uses a participatory evaluation approach—researchers and practitioners participating together in the effort—to directly and pragmatically serve the needs of design and improvement of library spaces and programs. Although our results will be shared with the academic research community, this project is geared to outputs that directly serve our library partners. Our research questions include: (1) What evaluation tools and practices can best support the development and improvement of connected learning programs in libraries? (2) What are the learning outcomes of connected learning programs in libraries? We address these questions through an approach that brings together current thinking and methods in educational research so that researchers and practitioners can collaboratively identify relevant issues, define key connected learning outcomes, design research tools, collect data, and analyze results.

Five library professionals from the YOUMedia CoP and LAPL will be recruited to team members at the beginning of the project. Our project team reflects a participatory approach by including: (1) library partners (LAPL, YOUMedia), (2) the research team (CU Boulder, SRI, Stanford), and (3) research/practice coordination (UCI) in addition to dissemination and outreach partners at YALSA and NWP. We will conduct monthly online project-wide team meetings, and engage with the online communities, conferences, and dissemination channels of our partners.

A participatory approach to evaluation helps partners together explore programs' *theory of change*, the vision that practitioners have about how their program is expected to work. These expectations for the program will work guide the selection of measures of the program's context (e.g., community, influences), features, and outcomes for evaluative studies (Chen, 1990; Chen & Rossi, 1980; Donaldson, 2007; Rogers, Petrosino, Huebner, & Hacsí, 2000). By being part of the process of reflecting on desired outcomes, refining research instruments, collecting data, and analyzing results, program developers and other stakeholders work with researchers to define the theory of change (Cousins & Earl, 1992; Cousins & Whitmore, 1998). Program participants, such as clients and audiences, may also be involved (Penuel & Freeman, 1997; Sabo Flores, 2007). Participatory evaluation embraces democratic ideals of voice and inclusion (Hart & Rajbhandary, 2003; House & Howe, 2000), improves evaluation, and also fosters greater uptake of evaluations (Reeve & Peerbhoy, 2007). The approach can be broken down into a four step process of 1) developing a program's theory of change, 2) assessing its plausibility, 3) developing measures, and 4) embedding measures within an evaluation plan. We have added a fifth step for our project: evaluative review of our own process.

1. Engage in a participatory process to develop detailed program descriptions: The first step in developing evaluation plans will be eliciting ideas from key stakeholders and participants regarding how their programs will produce expected results. These *theories of change* will include clear descriptions of designed features, the activities and behaviors that those features are meant to support, and outcomes that emerge. They will also include descriptions of how all these elements link together; these links indicate the mechanisms or processes of change through which the program should impact outcomes (Donaldson, 2007). Ideally, a theory of change reflects both points of agreement and divergence of opinion among different stakeholders about the program goals and key features (Weiss, 1995). These theories will define what outcomes are most important to measure in our evaluations, as well as the features we will investigate.

For example a YOUMedia learning lab's theory of change might focus on providing digital tools and workshops in order to boost the digital literacy of underserved youth, thus providing new pathways to educational and career opportunity. Working together with researchers, practitioners in this scenario would examine the details of what kinds of guidance and tools they are providing that leaders believe are critical for promoting these outcomes, how youth are engaging, and how to measure digital literacy gains and the longer term impact for school and career choices.

For CCLL, our program theories will be developed by the project team, informed by a broader set of interviews and surveys of library professionals, and refined in the workshops with LAPL and YOUMedia stakeholders. Because we are conducting evaluations of multiple programs, we will compare individual program theories and select measures that will enable comparison across settings and programs. We expect YOUMedia learning labs and STEAM oriented connected learning programs will have commonalities in how they are designed and the desired outcomes, and thus could use common measures and evaluation plans. We will be able to identify the appropriate learning outcomes and evaluation approaches for connected learning that generalize beyond the specific programs involved in this study.

2. Examine existing literature to assess theories of change: Evaluating whether programs' initial theories of change are likely to work as expected will be the next step in developing our evaluation plans. Not every theory of how to effect change is likely to produce the outcomes that designers hope for or expect. The research team will assess plausibility by considering past research and evaluation studies for evidence that similar designs can produce the kinds of outcomes designers seek. When no past program research is available, basic research on the learning processes associated with particular outcomes will be consulted. The team will develop an evaluability assessment (Wholey, 2004) for each program's theory in order to refine the theory, and help librarian partners refine and improve program designs, even ahead of designing the evaluation. To return to the YOUMedia learning lab example, prior research might indicate that in order for digital literacy developed in workshops to reliably connect to school and career opportunity, the program must also broker connections to learning opportunities in organizations outside of the library.

3. Develop and test measures for common program features, activities, and outcomes: Developing new measures will be an integral part of this project because few "off the shelf" measures are available or appropriate to use. The CU Boulder team will take the lead in creating measures, drawing from well-respected frameworks (National Research Council, 2001). The process will begin with identifying the program features, activities, and outcomes to be measured and then move to create items (for surveys), questions (for interviews), or protocols (for observations) that elicit relevant evidence for testing assumptions about how and how well programs work (Love, 2004; Yarbrough, Shulha, Hopson, & Caruthers, 2011). Outcomes measures will focus on short-term, immediate, and long-term effects of participation in the program (Ruiz-Primo & Furtak, 2007). Broader dimensions such as location, population, and other community resources can also be important factors to continue (Durlak & DuPre, 2008). To continue with the YOUMedia learning lab example, we would decide which program features to document (such as instructional methods and instructor preparation) and how to capture digital literacy, school, and career outcomes. We might also consider what are likely to be relevant contextual factors that could influence outcomes, such as the proximity of the library to residences and schools, and the availability of related programming in the local community.

Our library partners will be consulted on an ongoing basis during monthly project meetings as measures are developed. At the workshops with LAPL and YOUMedia networks, the research team will test measures with practitioners, using a modified "design charrette" to define constructs and initial measures (see, Penuel et al., 2015, for an example). After testing, the research team will analyze qualities of measures for reliability and their ability to discriminate among different "levels" or "qualities" of the outcome or implementation.

4. Embed measures within evaluation plans: After developing a set of measures, the project team will collaboratively develop evaluation plans to guide effective evaluation. The plans will specify what measures are to be collected, from whom, and when. In addition, plans will describe how

data will be analyzed, how the results can be used in program improvement and how the plan can help build an argument about the value of the program (House, 1977). The plans will also provide guidelines for how practitioners and evaluation researchers can work together, and what kinds of resources are needed in order to be effective.

5. Evaluate our progress: Throughout the project, we will monitor, measure, reflect, and revise as needed to improve our progress towards project goals, as specified in our evaluation plan in the earlier impact section of the narrative. Our findings about the appropriate learning outcomes and the most effective evaluation tools and practices for connected learning in libraries will be documented in our case studies and research papers.

Timeline and Activities

YEAR 1: In its first year, the project will focus on three core activities, (1) partnering with library professionals to constitute a project team and specify program theories, (2) surveying and reviewing existing instruments and practices, and (3) developing an initial set of instruments and evaluation plans to test at pilot sites.

1. Partnering: Five youth librarians and administrators will be recruited from the YOUMedia network and LAPL in order to constitute a project team that reflects a range of spaces and programs aligned with connected learning. The two networks of library professionals will represent two different types of contexts for connected learning in libraries: learning lab *spaces* for connected learning and *programs* that can be implemented in more varied and pop-up settings. We will select library partners based on their degree of alignment with connected learning goals, as well as based on the populations they are serving. In order to meet the digital inclusion goals of the project, we will seek partners who serve groups with limited access to high tech tools, bandwidth and programs. The project team will meet regularly, including a monthly project-wide meeting, to develop a set of program theories that are aligned with connected learning goals defined by YALSA. In order to refine these program theories we will coordinate one workshop in LA for the LAPL network. A second workshop will be conducted in coordination with NWP for the YOUMedia community of practice. UCI would lead on the recruitment and workshop coordination.
2. Surveying: The research team will survey 40-50 youth librarians within the LAPL, YALSA, and NWP networks to create (a) a needs assessment and (b) a review of existing measures being used in evaluating connected learning services. As part of this, we will also review existing library evaluation frameworks and efforts such as those developed by the Public Library Association, libraryedge.org, ACRL, and the Children's Museum of Pittsburgh's IMLS funded Making and Learning project in order to harmonize our efforts.
3. Development: The CU Boulder team will adapt the existing instruments, and refine them through the two workshops with library partners. The workshops will include co-design meetings aimed at brainstorming evaluation designs and items and providing feedback on instruments.

YEAR 2: In the second year, the CCLL project will (1) pilot and refine the evaluation plans and tools developed in the first year, and (2) begin outreach to a wider network of libraries and librarians.

1. Piloting: The project team will pilot the initial evaluation plans with the five LAPL and YOUMedia project team library sites. CCLL researchers will note needs not met by existing resources and develop and pilot new instruments to meet those needs. The UCI team will organize another set of workshops with the project team librarians and the broader LAPL

and YOUMedia networks aimed at continued co-design work, and development of professional development approaches and materials.

2. Outreach: Building on the workshops with the project team librarians, the UCI team will produce an online resource site and professional development webinars. These webinars and materials will be offered through YALSA and NWP's channels, and will be tailored to different library programs. One series of webinars will focus on evaluation needs of YOUMedia-like spaces, and another on programs and initiatives that can be offered in any library setting, that builds on the LAPL experiences.

YEAR 3: In its third year, CCLL will (1) refine and package the evaluation and professional development, while shifting focus to (2) synthesizing findings and producing case studies, and (3) broader outreach to events and other library and researcher networks.

1. Refining: By the third year, the evaluation tools and professional development materials will be packaged for easy online access on NWP and YALSA sites. The UCI team will produce additional webinars based on feedback from prior webinars.
2. Synthesis: We will analyze and synthesize data, drawing from the studies to highlight key program elements that support connected learning, as well as synthesizing evaluation results across our network. Outputs will include cross-case analyses of design features and outcomes, journal articles, and research reports tailored to key audiences which include practitioners, researchers, funders, and policy makers.
3. Broader Outreach: The final phase of the project will focus on embedding project outcomes within existing professional communities of researchers and librarians. We will conduct professional development workshops at relevant conferences, and develop materials that would enable others to conduct these workshops. We will disseminate the evaluation tools, case studies, and reports through existing channels and communities where stakeholders are already connected, including youmedia.org, informalscience.org, and LearnDBIR.org.

4. Diversity Plan

Libraries are well positioned to address an equity gap in connected learning because of their strong connections to low-income populations that lack digital tools and access at home; they are among the "community institutions that are best positioned to help meet the challenges of digital exclusion within their communities" (Jaeger et al., 2012, p. 10). This project will develop concrete measures and strategies for libraries to evaluate their progress towards these equity and diversity goals. These would include guidelines and ways of measuring whether groups at risk of digital exclusion are being served, and whether their participation is sustained. For example, prior research on the YOUMedia learning lab at Chicago's Harold Washington Library indicates that the space was successful in enlisting African-American youth at levels higher than comparable digital media programs. Serving this population was an important program goal (Larson et al., 2013). This project would support programs in making their diversity goals explicit, and developing approaches for how they can capture data to document their progress towards these goals in relation to relevant benchmarks.

5. Project Resources: Personnel, Time, Budget

Research Leads and Personnel

This project builds on the existing collaboration among Ito, Penuel, and Michalchik as part of the CLRN, which includes 17 faculty PIs and advisors in 14 universities. Informed by the broader research agenda of the network, Penuel and Michalchik have led in the development of measures of connected learning for the network and conducted a longitudinal study of youth development outcomes using the measures. Penuel will lead on adapting and tailoring measures for libraries; this project will cover a summer month of his time and a half-time postdoc to lead in the

development of measures. Working closely with Podkul at SRI, who has been a longtime collaborator on CLRN measurement studies, Michalchik will interface with library partners and conduct the data collection associated with the pilot evaluation plans. Michalchik will be provided with a consultant agreement to cover leave time from Stanford, and the SRI contract will cover Podkul's time at SRI to participate in this project.

In addition to being chair of the CLRN, Ito is also Research Director of the Digital Media and Learning Hub (DML Hub) at UC Irvine, which coordinates research, communication, and connections to educational partners across all of the MacArthur Foundation's Digital Media and Learning Initiative research projects. The DML Hub has coordinated meetings and research collaboration, and facilitated partnerships with educators, and will continue to play this coordinating role for this project. The DML Hub includes a team of 12 researchers, administrators, and communication staff who will support this project. The DML Hub is housed at the University of California Humanities Research Institute which includes an additional ten administrative, technology, and communications staff who support the activities of the DML Hub. Amanda Wortman is the research manager of the DML Hub and will manage this coordination. Ito and Wortman's time are dedicated full-time to the work of CLRN and the DML Hub, so this project will be part of their ongoing organizational responsibilities. For the first half of the project, Ito, Wortman, and administrative and communication staff time at UCI will be provided as a cost-share through existing MacArthur grants at UCI with aligned goals. Resumes and letters are attached for the following team members:

- Mizuko Ito, Professor in Residence, University of California, Irvine
- Bill Penuel, Professor of Educational Psychology and Learning Sciences, University of Colorado, Boulder
- Vera Michalchik, Director of Evaluation and Research, Stanford University
- Timothy Podkul, Research Social Scientist, SRI International
- Amanda Wortman, Collaborative Research Manager, University of California, Irvine

Library Partners and Personnel

NWP will be the point of contact for the YOUMedia network and online Community of Practice (community.astc.org), and YALSA for the broader community of youth librarians. LAPL will be involved with recruiting librarians as partners across a diverse system, and will pilot the program-focused evaluation plans through the Full STEAM Ahead initiative. With supervision from Elyse Eidman-Aadahl, K-Fai Steele will lead the coordination with the YOUMedia CoP. Candice Mack will take the role of project liaison for LAPL, and Beth Yoke for YALSA. This project will support the existing priorities of these partner organizations by providing evaluation tools, resources, training, and capacity. Resumes and letters are attached for the following library partners and personnel:

- Candice Mack, Interim Director, Young Adult Services, Los Angeles Public Library
- Beth Yoke, Executive Director, YALSA
- Elyse Eidman-Aadahl, Executive Director, National Writing Project
- K-Fai Steele, Program Associate, National Writing Project

In addition to these project partners and personnel, we will recruit five librarian professionals from the LAPL and YOUMedia networks to join the project team. Funds for leave time will be provided for project team librarians, and for K-Fai Steele and partner liaisons at LAPL and YALSA. We will also provide resources in the form of travel stipends and leave time to attend project workshops. In addition to the project team, we expect to involve 100-140 library professionals in workshops to develop and disseminate the measures and evaluation plans developed by this project.

6. Communications Plan

Our communications plan is integrated within the partnership and participatory design. The project brings together key stakeholders in educational research and public libraries to expand access to connected learning. We target evaluation researchers through DML Hub channels, and national networks of library practitioners via YALSA and NWP, as well as a local urban system through LAPL in order to serve a wide range of library stakeholders. As detailed in the project plan, we will engage and survey library partners early and often, and will solicit engagement from the broader research community through an open online course and ongoing events and communications hosted by the DML Hub. The DML Hub has a communications teams that can coordinate the production of publications and webinars and the overall dissemination effort with dissemination partners. All partners in this project have well-established communication channels, online communities, and events that serve the key stakeholders: the DML Hub, YALSA, NWP (via Educator Innovator and the YOUMedia Community of Practice), and LAPL. The evaluation plans, measures, case studies, and webinars resulting from the project will be disseminated and maintained through these existing channels, as summarized in the dissemination plan table. We will also disseminate the final products of this work through other sites reaching relevant stakeholders such as youmedia.org, informalscience.org, and LearnDBIR.org and others identified in our review of existing measures and evaluation plans.

Summary of Project Dissemination Channels:

The **Digital Media and Learning Hub** is an international research center that provides thought leadership on digital media and learning for academics and educators. Since the launch in 2009, DML Hub websites have been visited by over a million users. Media and communications assets include: 1) *Communication platforms*: Connected Learning Alliance (CLA) social media (Twitter, Facebook, Google+ community); DML Central blog (dmlcentral.net), 2) *Online Communities*: DML Commons open online courses (dmlcommons.net), and 3) *Events and Convenings*: Annual DML Conference.

The **National Writing Project's** constellation of sites and resources for professional development reach over 600,000 educators across the US. Their communication and dissemination assets include: 1) *Communication platforms*: Educator Innovator blog (<http://educatorinnovator.org>); YOUMedia Community of Practice (community.youmedia.org), 2) *Online Communities*: Connectedlearning.tv webinar series; YOUMedia Community of Practice webinars, and 3) *Events and Convenings*: Annual YOUMedia workshop.

The **American Library Association** and the **Young Adult Library Services Association** serve as the backbone for librarian professional development and resources across the US, with the former serving 58,000 members and the latter reaching over 5,100 young adult librarians. Their online resources are seen by thousands every month (e.g., YALSA blog averages 12,000 views per month alone). The communication and dissemination assets they will be contributing to this project include: 1) *Communication platforms*: YALSA contact/ mailing list; YALSA Blog; YALSA weekly e-newsletter; YALS quarterly journal of best practices; JRLYA Journal of Research on Libraries and Young Adults; ALA Journals, such as: Library Journal, School Library Journal, Library Trends, and 2) *Events and Convenings*: the annual YA services symposium; ALA annual and midwinter conferences.

The **Los Angeles Public Library's** 73 locations serve the largest population of any public library system in the US, with each branch responsive to the needs of millions of LA residents by providing social, cultural, and educational services. During fiscal year 2014-2015, the LAPL offered over 24,000 programs for children, teens, adults and seniors, and hundreds of opportunities to volunteer. The LAPL serves as a key recruitment and outreach partner. We will engage with the

YEAR 1 (6/1/2016 - 5/31/2017)

Activity	2016							2017				
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Year 1: Partnering, Surveying and Development												
Activity 1: Partnering												
Recruit 5 youth librarians to form project team (UCI coordinates)												
Activity 2: Surveying												
Needs assessment and review of existing measures (CU Boulder)												
Survey 40-50 librarians (Stanford/SRI)												
Activity 3: Development												
Develop initial instruments and program theories (CU Boulder)												
Workshops for LAPL and YOUMedia networks to refine program theories (UCI coordinates)												

Color legend

UCI	
Stanford/SRI	
CU Boulder	
Multiple teams	

**Schedule of Completion
Capturing Connected Learning in Libraries**

YEAR 2 (6/1/2017 - 5/31/2018)

Activity	2017							2018				
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Year 2: Piloting and Outreach												
Activity 1: Piloting												
Pilot and revise evaluation plans (Stanford/SRI, CU Boulder)												
Workshops with LAPL and YOUmedia networks (UCI coordinates)												
Activity 2: Outreach												
Produce case studies and an online resource site (UCI)												
Professional development webinars and workshops (all hands)												

Color legend

UCI	
Stanford/SRI	
CU Boulder	
Multiple teams	

YEAR 3 (6/1/2018 - 5/31/2019)

Activity	2018							2019				
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Year 3: Refining, Synthesis, and Broader Outreach												
Activity 1: Refining												
Package evaluation tools & PD materials for easy online access (Stanford/SRI, CU Boulder)												
Professional development webinars (UCI coordinates)												
Activity 2: Synthesis												
Analyze and synthesize data (Stanford/SRI, CU Boulder)												
Produce case studies, reports, and articles (all hands)												
Activity 3: Broader Outreach												
Professional development workshops at conferences (all hands)												
Disseminate evaluation tools, case studies, reports through existing channels and broader communities (all hands)												

Color legend

UCI	
Stanford/SRI	
CU Boulder	
Multiple teams	

DIGITAL STEWARDSHIP SUPPLEMENTARY INFORMATION FORM

Introduction

The Institute of Museum and Library Services (IMLS) is committed to expanding public access to federally funded research, data, software, and other digital products. The assets you create with IMLS funding require careful stewardship to protect and enhance their value, and they should be freely and readily available for use and re-use by libraries, archives, museums, and the public. However, applying these principles to the development and management of digital products is not always straightforward. Because technology is dynamic and because we do not want to inhibit innovation, we do not want to prescribe set standards and best practices that could become quickly outdated. Instead, we ask that you answer a series of questions that address specific aspects of creating and managing digital assets. Your answers will be used by IMLS staff and by expert peer reviewers to evaluate your application, and they will be important in determining whether your project will be funded.

Instructions

If you propose to create any type of digital product as part of your project, complete this form. We define digital products very broadly. If you are developing anything through the use of information technology (e.g., digital collections, web resources, metadata, software, or data), you should complete this form.

Please indicate which of the following digital products you will create or collect during your project

(Check all that apply):

	Every proposal creating a digital product should complete	Part I
	If your project will create or collect	Then you should complete
<input checked="" type="checkbox"/>	Digital content	Part II
<input type="checkbox"/>	Software (systems, tools, apps, etc.)	Part III
<input checked="" type="checkbox"/>	Dataset	Part IV

PART I.

A. Intellectual Property Rights and Permissions

We expect applicants to make federally funded work products widely available and usable through strategies such as publishing in open-access journals, depositing works in institutional or discipline-based repositories, and using non-restrictive licenses such as a Creative Commons license.

A.1 What will be the intellectual property status of the content, software, or datasets you intend to create? Who will hold the copyright? Will you assign a Creative Commons license (<http://us.creativecommons.org>) to the content? If so, which license will it be? If it is software, what open source license will you use (e.g., BSD, GNU, MIT)? Explain and justify your licensing selections.

All digital content produced by the project will be assigned the Creative Commons Attribution-NonCommercial 4.0 International License. Under this license, others will be able to share, redistribute, remix, and build upon our work non-commercially. They agree to the terms of attribution, and not using the content for commercial gain.

The research datasets created by the project will be deposited in institutional repositories, and all research articles produced from the data will be published free, online at the Digital Media and Learning Research Hub's website and through our partner's sites. Open-access journals will be sought out when publishing in discipline-specific venues as well.

Per university guidelines, the researchers collecting the data will hold the copyright of any datasets produced.

In addition, all University of California policies regarding Intellectual Property will apply.

A.2 What ownership rights will your organization assert over the new digital content, software, or datasets and what conditions will you impose on access and use? Explain any terms of access and conditions of use, why they are justifiable, and how you will notify potential users about relevant terms or conditions.

The digital content we create is intended to be widely available, with attribution. There will be no conditions on access or personal use of the content. As interested parties will be other like-minded individuals and institutions, we do not anticipate any issues with access and use. Our Creative Commons license (referenced in A.1) will be clearly displayed on all digital content.

A.3 Will you create any content or products which may involve privacy concerns, require obtaining permissions or rights, or raise any cultural sensitivities? If so, please describe the issues and how you plan to address them.

All research will be carried out under the guidelines of each university's Office of Research and will adhere to strict Human Subjects Research guidelines. As such, consent will be obtained from all research participants on a form which outlines all that participation entails.

Part II: Projects Creating or Collecting Digital Content

A. Creating New Digital Content

A.1 Describe the digital content you will create and/or collect, the quantities of each type, and format you will use.

Surveys of librarians will be collected via an online portal and stored as spreadsheets.

Data from librarian interviews and workshops will be audio recorded and transcribed into text.

The online resource site will house professional development webinars, evaluation tools, cross-case analyses, and research reports. The toolsets, case studies and reports will be downloadable as PDFs, and webinars will be hosted on YouTube, and downloadable by request.

A.2 List the equipment, software, and supplies that you will use to create the content or the name of the service provider who will perform the work.

The online resource site will be hosted by the Digital Media and Learning Research Hub at the University of California, Irvine. Wordpress will likely be used for the creation and management of content hosted on the server.

A.3 List all the digital file formats (e.g., XML, TIFF, MPEG) you plan to create, along with the relevant information on the appropriate quality standards (e.g., resolution, sampling rate, or pixel dimensions).

Survey data will be stored in .xls or .csv file format. Audio files of workshops and interviews will be stored as .mp3 or .m4a files and transcribed into .docx files. Online resources will be disseminated as .pdf files. All will be stored and disseminated at the highest quality level possible, but lower resolution content will be available upon request so institutions with slower download speeds can still access them.

B. Digital Workflow and Asset Maintenance/Preservation

B.1 Describe your quality control plan (i.e., how you will monitor and evaluate your workflow and products).

The quality control plan is embedded in the larger work plan of the Capturing Connected Learning in Libraries project. The completion of the project builds on earlier phases of the work so deadlines will need to be strictly adhered to. The initial needs assessment and survey of librarians is imperative to craft later portions of the work. Feedback from librarians will be solicited often and resources will be updated with their feedback. As our team and partners have been collaborating since 2011, we have established guidelines and protocols for monitoring work flow and evaluating processes.

B.2 Describe your plan for preserving and maintaining digital assets during and after the award period of performance (e.g., storage systems, shared repositories, technical documentation, migration planning, commitment of organizational funding for these purposes). Please note: You may charge the Federal award before closeout for the costs of publication or sharing of research results if the costs are not incurred during the period of performance of the Federal award. (See 2 CFR 200.461).

Digital content produced by the grant will be published and maintained on the Digital Media and Learning Research Hub's website, as well as partner's websites. As this project is linked with other research and Hub work, the site is expected to be maintained and running for years. Project datasets uploaded to institutional repositories will be stored indefinitely and the respective university's shoulder that long-term cost.

C. Metadata

C.1 Describe how you will produce metadata (e.g., technical, descriptive, administrative, or preservation). Specify which standards you will use for the metadata structure (e.g., MARC, Dublin Core, Encoded Archival Description, PBCore, or PREMIS) and metadata content (e.g., thesauri).

We have no specific plans to collect or create metadata for this purposes of this project.

C.2 Explain your strategy for preserving and maintaining metadata created and/or collected during and after the award period of performance.

N/A

C.3 Explain what metadata sharing and/or other strategies you will use to facilitate widespread discovery and use of digital content created during your project (e.g., an API (Application Programming Interface), contributions to the Digital Public Library of America (DPLA) or other digital platform, or other support to allow batch queries and retrieval of metadata).

Because our content is intended for a particular audience of librarians and museum practitioners, we expect much of the discovery of our project work will be pushed out by our partners in YALSA, National Writing Project, and American Library Association.

D. Access and Use

D.1 Describe how you will make the digital content available to the public. Include details such as the delivery strategy (e.g., openly available online, available to specified audiences) and underlying hardware/software platforms and infrastructure (e.g., specific digital repository software or leased services, accessibility via standard web browsers, requirements for special software tools in order to use the content).

Project content will be freely and easily accessible to the public through our website, and the websites of our partners. No specific software or infrastructure will be required. We will make every effort to ensure a quality experience across all major web browsers.

These sites will be actively promoted to librarian and museum practitioner communities via our partners and listservs, Twitter and other social media sites.

D.2 Provide the name and URL(s) (Uniform Resource Locator) for any examples of previous digital collections or content your organization has created.

dmlhub.net/publications
researchtools.dmlhub.net
learndbir.org
researchandpractice.org

Part III. Projects Creating Software (systems, tools, apps, etc.)

A. General Information

A.1 Describe the software you intend to create, including a summary of the major functions it will perform and the intended primary audience(s) this software will serve.

A.2 List other existing software that wholly or partially perform the same functions, and explain how the tool or system you will create is different.

B. Technical Information

B.1 List the programming languages, platforms, software, or other applications you will use to create your software (systems, tools, apps, etc.) and explain why you chose them.

B.2 Describe how the intended software will extend or interoperate with other existing software.

B.3 Describe any underlying additional software or system dependencies necessary to run the new software you will create.

B.4 Describe the processes you will use for development documentation and for maintaining and updating technical documentation for users of the software.

B.5 Provide the name and URL(s) for examples of any previous software tools or systems your organization has created.

C. Access and Use

C.1 We expect applicants seeking federal funds for software to develop and release these products under an open-source license to maximize access and promote reuse. What ownership rights will your organization assert over the software created, and what conditions will you impose on the access and use of this product? Identify and explain the license under which you will release source code for the software you develop (e.g., BSD, GNU, or MIT software licenses). Explain any prohibitive terms or conditions of use or access, explain why these terms or conditions are justifiable, and explain how you will notify potential users of the software or system.

C.2 Describe how you will make the software and source code available to the public and/or its intended users.

C.3 Identify where you will be publicly depositing source code for the software developed:

Name of publicly accessible source code repository:

URL:

Part IV. Projects Creating a Dataset

1. Summarize the intended purpose of this data, the type of data to be collected or generated, the method for collection or generation, the approximate dates or frequency when the data will be generated or collected, and the intended use of the data collected.

The data collected will support the development of methods and tools for evaluating the scope and influence of library services, and contribute to the understanding of connected learning in libraries. The data collected will include surveys, interviews, and workshops during years 1 and 2.

2. Does the proposed data collection or research activity require approval by any internal review panel or institutional review board (IRB)? If so, has the proposed research activity been approved? If not, what is your plan for securing approval?

Yes, the proposed research activity will require approval from the Institutional Review Board. As this project includes partners at multiple institutions, each institutional partner's IRB will need to approve the research being done. All institutions have a proven track record for securing IRB approval of research and don't foresee any problems.

3. Will you collect any personally identifiable information (PII), confidential information (e.g., trade secrets), or proprietary information? If so, detail the specific steps you will take to protect such information while you prepare the data files for public release (e.g., data anonymization, data suppression PII, or synthetic data).

No personally identifiable data, confidential information or proprietary information will be collected.

Our consent forms, as will be submitted for institutional review and approval, will ensure participants that at no time in presentation or discussion of research findings will they be individually or personally identified to anyone from outside the research group. Furthermore, research findings will not be presented in such manner that would permit knowledgeable persons to infer participants' identity, even with names omitted. All information collected will remain confidential except as may be required by federal, state, or local law.

4. If you will collect additional documentation such as consent agreements along with the data, describe plans for preserving the documentation and ensuring that its relationship to the collected data is maintained.

Interviews and workshops will require signed consent forms from participants. All consent forms will be stored in a locked filing cabinet in the PI's offices. They will be kept for the standard length of time IRB's require, or 1 year after the completion of the data collection.

5. What will you use to collect or generate the data? Provide details about any technical requirements or dependencies that would be necessary for understanding, retrieving, displaying, or processing the dataset(s).

An online survey tool (Qualtrics) will be used to collect the librarian survey data. Handheld audio devices will be used to record interview and workshop audio data.

6. What documentation (e.g., data documentation, codebooks, etc.) will you capture or create along with the dataset(s)? Where will the documentation be stored, and in what format(s)? How will you permanently associate and manage the documentation with the dataset(s) it describes?

Survey codebooks will be created and stored in spreadsheet format and only shared amongst the survey team. Interviews and workshops, after being transcribed, will be stored in Dedoose, a collaborative, cloud based data analysis tool.

7. What is the plan for archiving, managing, and disseminating data after the completion of the award-funded project?

After the completion of the research activity, the datasets will be stored on secure servers at each respective institution for the length of time they are required, typically 1 year after the completion of data collection. Resources, tools, and reports created from the data will be stored and managed indefinitely on the DML Hub website and the websites of our partners.

8. Identify where you will be publicly depositing dataset(s):

Name of repository: Escholarship

URL: escholarship.org/deposit.html

9. When and how frequently will you review this data management plan? How will the implementation be monitored?

We will review this data management plan after the collection of each major data set, which falls in line with the yearly timeline of the project. The implementation will be monitored by the data manager of the Digital Media and Learning Research Hub, serving as the project manager of this project.