Transforming and Scaling Teen Services for Equity, Diversity, and Inclusion (TS4EDI)

Funding Category*: Research in Service to Practice*

Project Category: *Lifelong Learning*

Creative and purposeful youth-centered learning activities give teens the chance to exercise capacities such as collaborating, communicating, critical thinking, and problem solving that are essential for their future. Research shows that learning activities particularly effective at engaging young people combine their personal *interests*, supportive *relationships*, and *opportunities* for academic, occupational, and personal growth—an approach called connected learning (CL) (Ito et al. 2020). Connected learning activities allow young people to explore a variety of platforms, tools, and media to achieve meaningful outcomes. These activities also can create vital links to new educational and career opportunities, which can be especially helpful in small, rural, or tribal communities (Phillips et al. 2018). It is in this context that the TS4EDI project will conduct research that supports the creation of dynamic connected learning experiences for youth from underserved communities by addressing the following needs:

Need 1: *Clarity on approaches to* ***designing effective connected learning experiences.***

Need 2: *Capacity to* ***use evaluation to adapt and improve programming****.*

Need 3: *Commitment by multiple stakeholders to* ***scale exemplary models****.*

To address these needs, TS4EDI will engage researchers and practitioners in a research collaboration that answers the following sets of questions:

1. **Connected learning design**. What challenges do library staff face in the design and implementation of CL programming for underserved teens, and how can these challenges be overcome?
2. **Evaluative approaches for improvement**. How can library staff use evaluation to (a) continuously improve their understanding of youth needs as they create CL opportunities, and (b) promote effective models for implementing and expanding CL?
3. **Documentation and support for scaling**. How can better resources for CL design and evaluation be used to (a) demonstrate the value of CL programs, and (b) build stakeholder support for increasing the programs' scope and scale, particularly in service to equity goals?

The project builds on research showing that studying program design and implementation—not just outcomes—is necessary to develop and scale effective programs in service to equity (Bevan and Penuel 2017).

The TS4EDI project grows out of a collaboration among three IMLS-funded projects (see diagram). The goals of the first project, *Capturing Connected Learning in Libraries* (CCLL) (LG-81-16-0012-16), have been to create evaluation resources that enable libraries to better assess learning outcomes for their CL programs and spaces, and to use evaluation data to improve their programs. The second, *Transforming Teen Services: A Train the Trainer Approach* (T3) (RE-95-18-0048-18), builds the capacity of libraries and communities around the country to prioritize teen services by developing staff capabilities to use CL principles in designing new programming, particularly for engaging teens in computational literacies. The third, *Future Ready with the Library: Connecting with Communities for College and Career Readiness Services* (Future Ready) (RE-40-16-0081-16), has supported the capacity of small, rural, or tribal libraries to provide future-oriented services for middle schoolers. Together, these projects have developed new approaches to creating, implementing, and improving youth services to address inequalities in underserved communities. Yet, these projects have also revealed challenges that libraries face, such as adapting approaches developed elsewhere to rural regions.

Statement of National Need

Even before COVID-19, racial and economic disparities in America's schools had been accelerating. Affluent students increasingly benefit from access to creative and connected forms of learning while others do

not (McFarland et al. 2019; Owens, Reardon, and Jencks 2016). A similar trend has been occurring out of school, where wealthier families invest heavily in the extracurricular and enrichment activities consequential to the life outcomes of their children (Putnam 2015; Rivera 2011; Silva, Snellman, and Frederick 2014). Opportunity gaps show up in two areas: first, limited access to vibrant learning activities; second, limited access to informal mentors and "institutional agents" such as teachers, who can provide social capital and brokering roles in young peoples' lives (e.g., Freeland-Fisher 2018; Stanton-Salazar 2010). The pandemic has only exacerbated these types of educational disparities (e.g., Kuhfeld et al. 2020).

All teens seek opportunities to engage in creative and purposeful activities—the types of youth-centered, technology-enabled learning activities that libraries are ideally positioned to offer (Lee and Phillips (eds.) 2018). Through these activities, teens can explore a variety of platforms, tools, and media in order to collaborate, communicate, and problem solve, exercising capacities essential in preparing for their future (Braun et al. 2014; Penuel et al. 2018; Subramaniam et al. 2018). The valuable learning experiences that happen in one setting—e.g., home, school, community centers, online, and libraries—can and should build on learning that happens elsewhere (Barron 2006; National Research Council 2015; Pinkard 2019). Libraries are situated to provide teen-oriented educational experiences that develop digital literacy and other 21st century capacities and, at the same time, broker young people's connections to new opportunities that will level up their learning (Barron et al. 2014; Ching et al. 2016). Moreover, libraries can offer new relationships, mentorships, and other forms of social capital crucial for young people as they embark on further educational and career paths (Clegg and Subramaniam 2018; Johnson and Griffis 2013)—particularly helpful in small, rural, or tribal communities (Phillips et al. 2018). The public health and racial crises of 2020-21 have made libraries focus on re-envisioning the ways they serve non-dominant communities. It is in this context that the TS4EDI project will address the following needs.

Need 1: *Clarity on approaches to designing effective teen learning experiences, explicitly to meet the needs of the underserved.* The T3 project has shown that library staff have difficulty applying research-based principles to teen services design; research is required to understand why and to help test new approaches.

In the final year of the project, T3 is meeting its objectives and inspiring participants to develop CL services for teens. During an evaluation session, one participant offered, "I like that it took connected learning beyond tech and STEM, because it is so much more than that." Another contacted the project lead to share, "I feel like my personal training style has been transformed…I'm struggling to convey just how grateful I am to all of you—the work our group did in Seattle will reverberate for years." The trainers all agreed that the project is helping to prioritize teen services at their library or state library agency.

However, as much as participants appreciate the principles and value of CL, they still request support for designing CL services from the ground up. Participants want more examples of CL activities for computational thinking; broadly, they seek additional support for adapting and implementing CL programs in a diversity of libraries, particularly for those with underserved populations, and in small, rural, or tribal communities. In sum, while success is seen in all phases, there are significant opportunities for improved adaptation in a variety of settings and expansion to others. Additionally, library staff express the desire to see sustained changes in how they embed and evaluate CL, the long-term effects enduring. As one participant in T3 said, "I don't want this to be something that in five years we say—remember that YALSA training we did?"

Need 2: *Capacity to use evaluation to adapt and improve programming.* The CCLL project has created and piloted resources proven useful to library staff in primarily urban settings in developing teen services, but is only beginning to widely test its tools and approach across more demographically varied sites.

At the same time, the T3 trainers are struggling to learn more about how the trainings they provide actually impact libraries in their state. They would like access to information about frontline results and to be able to make adjustments based on actionable evidence, but data gathering is outside the scope of the

original project, and no structures were put in place to support it. Consequently, the trainers have not been able to answer questions about practical implementation of the trainings in libraries and communities. One trainer from a state agency explained the difficulty her office has had, stating, "I haven't designed a good way to follow-up with trainees [and]…would appreciate hearing about ways to conduct follow-up post training."

The CCLL project has brought researchers and practitioners together to develop measures for formatively evaluating CL in libraries—precisely the partnership approach between researchers and practitioners the T3 project has been seeking to meet its current challenges. CCLL's partnerships have included extensive onsite engagement with library patrons and staff to create practitioner workshops that have resulted in the development of a suite of tools, case studies illustrating their use, a video series focused on building evaluation capacity in libraries, conference presentations for dissemination, high-profile publications oriented to both practitioners and researchers, and a guide to help libraries evaluate and improve CL programs for youth. This guide, which is geared towards small, rural, and tribal libraries, was created when the CCLL team learned about Future Ready library staffs' evaluation needs and partnered with them to develop it (Widman et al. 2020). As one Future Ready participant said, "Until using this guide, I never realized exactly how much impact evaluation can have on teen services." These responses from Future Ready participants show the importance of providing these resources and related supports to a broad range of libraries.

Need 3: *Commitment by multiple stakeholders to scale exemplary models.* Not all stakeholders understand the importance of teen library services, particularly for low-income and minoritized youth. The proposed research can help propagate new models for teen services among individual libraries, state library agencies, and national library associations—reaching new audiences in the communities they serve.

As libraries in geographies across the country work to reimagine and renew services for low-income and minoritized teens, they are looking to find and emulate successful models in their efforts. State library agencies and national associations, with the right supports, can fill this gap if they value, commit to, and distribute information, training materials, and other resources for high quality services. A project such as the one we propose can help leaders in the field communicate the goals and principles of CL, disseminate resources such as guidebooks and evaluation instruments, share approaches with staff, and demonstrate teen services models that libraries have found successful. By helping leading agencies support teen services in these ways, TS4EDI will bring to culmination its three foundational projects.

The CL model is central to the impacts of TS4EDI and the IMLS-funded projects it proposes to scale. The model reflects over a decade of research that emphasizes the science of learning in tandem with investigating effective approaches to education in a changing media ecology (Ito et al. 2013; 2020). These same elements are also key to library services designed to meet the needs of underserved teens. Libraries accomplish this in four ways, by providing: (1) support for youths' interests (2) within a social context of shared purposes and (3) collaborative activities that also (4) link participating youth to new opportunities. The YALSA *Future of Library Services for and with Teens* report points to CL as "the core of library services for and with teens. Connected learning provides a foundation for what teens need and want from libraries" (Braun et al. 2014:10).

Project Design

Framework. TS4EDI will use a *research-practice partnership* approach, in which researchers will focus their efforts on solving the problems library practitioners identify as critical to improving services, and working with them in cycles of design and testing to solve these problems (Coburn and Penuel 2016). Leaders in the CCLL project and YALSA's T3 and Future Ready will work together to identify the most effective means for scaling CL services for teens, leveraging relationships developed through the T3 and Future Ready projects with state and national agencies (COSLA, PLA, and YALSA) to increase commitment to quality CL practice across the U.S. The project will engage co-equal partners from state library agency staff in Wisconsin (WI) and

Rhode Island (RI), both states with expanding needs for teen services across diverse communities and geographies and with agencies committed to the goals of this project. These state library agency partners, who are active participants in the T3 project, will identify and engage 3 to 5 pilot sites in tribal, rural, urban, and suburban libraries in WI and RI serving demographically and economically diverse areas with varying degrees of CL-type programming.

Design-Based Methods. The Connected Learning Lab (CLL) at the University of California, Irvine, which leads the CCLL project, will bring to the partnership capacity in *design-based research* to support libraries' use of evaluation techniques to better plan, implement, and improve CL programs for teens. Design-based methods iterate on program plans and implementation. Working with researchers, leaders in YALSA's T3 and Future Ready projects work will bring their newly acquired skills to scale through trainings, ongoing coaching and mentoring within a community of practice, and dissemination of resources focused on expanding CL services for teens. Using a participatory approach (Donaldson 2007; Tzou et al. 2018), the TS4EDI team will help the state and local library partners develop research skills, enriching their capacity, their ability to train others, and the quality of the TS4EDI research.

Youth Participatory Action Research. We also will enlist youth at library sites as co-researchers, engaging them in formulating questions, collecting data, and presenting results in an approach inspired by youth participatory action research (Cammarota and Fine 2008; Watson and Marciano 2015). The youth will be recruited from among active library patrons and non-users in the community to gain a range of perspectives. Other key stakeholders include national associations committed to supporting this project through communication, endorsement, and dissemination of tools, models, guides, findings, and other resources developed by the project. These associations include COSLA, PLA, and YALSA (see letters of support).

Research Questions. The research questions for the project will be answered with methods for creating new knowledge that can lead to outputs directly useful to practitioners. It is worth emphasizing that, in the true spirit of a research-practice partnership, these questions will be elaborated upon and refined in the processes of mutual collaboration as details of the challenges faced by libraries, state agencies, and associations are explored. We will track, vet, and operationalize practitioners' concerns related to our three topical strands of research inquiry: **(1) connected learning challenges, (2) evaluative approaches for improvement,** and **(3) documentation and support for scaling**. These research strands are interrelated. Our previous CL projects (e.g., Allen et al. 2020) indicate that integrating evaluation approaches for improving library services works best as part of program development. This effort is strengthened by knowing how stakeholders at local, state, and national levels understand the needs of underserved teens, the options for meeting those needs through CL approaches, and the supports necessary to provide quality services that are designed explicitly for underserved teens.

YEAR 1

The first year focuses on answering RQs 1 and 2 by studying and documenting challenges to designing and evaluating CL opportunities with 3 to 5 libraries each in WI and RI in order to test improved approaches. Library staff and youth will help inform the design of the research instruments.

Methods

Documentation and session review. The core RPP team, which includes the research staff, the T3 project lead, and the leads from each state agency (RI and WI), will begin by reviewing documentation (e.g., plans, meeting notes, reports, products such as guidebooks and case studies) from previous project work (CCLL, T3, and Future Ready), from recent publications (e.g., Lee and Phillips (eds.) 2018), and from session observations and fieldnotes from the all-hands T3 meeting in November 2021. Based on these data sources, the team will create a typology of challenges that occur in designing and implementing CL programming and

the conditions under which these challenges occur—including rural, suburban, and urban settings. These findings will be discussed and combined with the insights of the RPP team members based on their experience in the field in order to define key areas for further investigation.

Analyzing strategies. Using findings from the review above, the core RPP team plus representatives from local libraries in WI and RI will consider potential strategies for supporting libraries as they work to create CL programs. This method will form a conceptual and practical framework for the rest of the research, but will remain dynamic throughout the TS4EDI project as it employs research methods based on iterative cycles of design, implementation, and improvement. Techniques for analyzing strategies (such as theories of change and conjecture maps) have been used effectively, including by members of the TS4EDI team, to better analyze design options for achieving intended program goals (Sandoval 2013).

Interviews. The RPP team will design interview protocols to use with staff at the 3 to 5 libraries recruited per state in WI and RI. The team will develop criteria for library selection, seeking a mix of factors such as degree of experience with CL, record of successes and challenges, community demographics, rural or urban setting, and so forth. The WI and RI state agency leads will be the main contacts in the recruitment process. The interviews will cover topics such as staff familiarity with CL, background with teen programming, challenges in creating new programs, and needs and goals for teen services. The interview protocols will be vetted with senior staff at the 3 to 5 libraries in each state to gather their suggestions, helping us revise our framework and improve our protocols.

We will enlist teens nominated by each library to participate in a similar process for developing youth-facing interview protocols. We expect that from among the nominees, 2-4 teens per library will be interested in discussing their challenges and aspirations, the kinds of questions that would best elicit meaningful input from other youth, and whom they would suggest as interviewees from among their peers—including non-users, who would be eligible to join in the research and solicit input from other teens. The youth will be trained in aspects of the research process according to their interests and capabilities (Buck and Magee 2017).

Surveys. After piloting and finalizing interview questions, the core team will develop surveys parallel in content that can be used easily, inexpensively, and at scale to gather information about libraries' experiences with CL programs. These surveys will be tested with volunteers from libraries recruited through the state agencies and collaborating libraries in each participating state; once tested, they will be administered through national associations and networks to library staff across the U.S. By drawing attention to CL and explicating its core principles, the surveys will improve awareness and understanding of how CL might be of interest to libraries responding to the survey.

Participant observations. Parallel with the development of interviews and surveys, RPP members will observe programs at the 3 to 5 collaborating libraries in each state and at up to 6 other sites as purposively selected to represent diversity based on the demographics and socioeconomics of the community served and the types of teen programming offered. The observations, focused on activities and use of resources the libraries have designed for teens, will be guided by customized protocols created in accord with the framework described above, and will also include fieldnotes based on observations, participation in key activities, and informal interaction with staff and patrons.

Analysis. All data sources will be subject to mixed method analyses consistent with standards of practice in the field (Creswell and Creswell 2017). Specifically, we will review data quickly after collection in order to identify which portions are most relevant to the research questions and to immediately develop hypotheses and analytic schemes to test against additional evidence. Our field notes, interviews, and other qualitative documentation will be coded using specialized software (e.g., Dedoose, NVivo) for thematic analysis (Xu and Zammit 2020), organized in memoranda for narrative analysis (Riessman 2008), and parsed in detail when discourse analysis is merited (Wood and Kroger 2000). We will use these methods to construct

individual case studies for each of the partner sites and then compare and contrast them in a cross-case analysis (Yin 2017), deriving common and contrasting challenges in implementation and evaluation of teen programming, means of addressing the challenges, and general principles for practice.

Outcomes (year 1)

The methods described above will provide research results for developing improved CL services. In addition to increasing capacity at the 3 to 5 libraries participating in WI and RI, new approaches based on these results will be made widely applicable through iterative testing at additional libraries.

YEAR 2

In year 2 the project team will conduct 2-3 iterative rounds of design-based research, incorporating both staff and youth voices by testing virtual training and coaching with library staff, and library-based program models with teens. Using the lessons learned in year 1, the project team will revise interview and survey protocols for broader administration in year 2.

Methods

Training observations and reflections analysis. Using findings from year 1, the project team will develop trainings for library staff in the 3 to 5 libraries in WI and RI to support integration of CL and evaluation into library staff's work with teens. Trainings will take place virtually—through forums, online training modules, and coaching/mentoring sessions—and cover topics such as how to build evaluation into CL services. The trainings will include working through core content and examples, giving participating library staff the opportunity to discuss applications and designing next steps for their own libraries. By piloting activities between sessions, library staff will gain hands-on practice and realistic feedback from colleagues and members of the research team, adapting their designs based on results. Researchers will take fieldnotes during these sessions, seeing first-hand the challenges and successes related to integrating CL and evaluation into teen library services. Participating library staff will be provided with templates to help them reflect on how the training impacts their practice; they will be asked to provide copies of these reflections to the research team just after the training, and again 3-4 months later.

Teen program observations and reflections analysis. Staff in the participating libraries in WI and RI will plan and facilitate CL programming and develop CL evaluations in their libraries. Staff will work with the research team and their assigned coach/mentor from the state library agency in all aspects of this work. Following each programmatic activity, staff will be asked to document their reflections, which will inform the project team about what aspects of the work are and are not effective. RPP team members will look at changes in practice, continued challenges to success, and examples that can act as models for library staff across the United States. They will extract and synthesize key challenges and design solutions to test in subsequent phases of implementation in years 2 and 3.

Interviews and surveys. In order to understand changes and experiences in providing teen services, interviews will be conducted with all staff providing teen services, their directors, and 8-10 youth in our participating libraries. Importantly, the interview protocols will have both "pre-" and "post-" versions in order to allow for follow-up after interventions. They also will be extensible to a broader range of libraries as part of a toolkit for future use.

Surveys will be used with a wider set of staff and youth—all library staff and up to 2-3 dozen youth (approximately 200 teens total across both states) at the recruited libraries. Surveys will also be administered to investigate CL implementation and "market test" new resources at up to 6 other libraries, selected using a sampling method based on their potential for providing useful accounts of experiences designing and implementing CL programs. Interview protocols and surveys will be developed based on lessons learned from

needs assessment in year 1 and implementation research in year 2, modified to add to greater understanding of how to scale CL services for teens in differing communities and geographies.

Outcomes (year 2)

Testing of new resources (e.g., training modules, guidebooks, video seminars, and coaching/mentoring approaches) and practice briefs documenting successes and challenges of implementation in diverse settings will allow for further development and refining of resources and will provide the basis for wide-scale communication and expansion.

YEAR 3

In year 3, the project team will codify the tools and techniques created to support library staff development and will communicate with professional networks regarding the needs, approaches, and benefits of CL services for teens. Research and analyses conducted in years 1 and 2 will enable the project team to disseminate findings in year 3 and provide opportunities for library staff to build their skills and knowledge through videos, coaching sessions, articles, and conference presentations. The project team will also monitor the communications channels used to provide these resources to administrative and teen services staff across library networks, to better determine—for the long term—the most effective methods for sharing information, resources, and models. This work will provide answers to RQ3.

Methods

Interviews about case studies and practice briefs. Using data collected through working with the 3 to 5 libraries in WI and RI, 5 case studies will be developed by the project team. These will be in-depth accounts of what is required to successfully develop and deliver CL opportunities with embedded evaluation. CL program models described in case studies will discuss processes for replication and expansion captured by the research. The team will also develop 5 practice briefs which will be shorter, less in-depth overviews of the benefits and techniques required for delivering CL opportunities through public libraries. The team will conduct interviews or surveys with personnel from 12-15 state agencies and national associations to assess views of these products and their usefulness for scaling CL services for teens.

Observation and evaluation of online modules. Analysis of fieldnotes, reflections, and recordings of virtual trainings held in year 2 will enable the project team to refine online modules that build skills and buy-in among library staff. In year 3, the project team will offer at least five online modules that cover topics and needs determined essential in years 1 and 2. Special attention will be given to helping library staff tackle challenging topics around cultural competency, racial justice, and EDI using proven successful models like the IMLS-funded Project READY work, and the recently published *Field Guide for Preparing to Support Communities in Crisis* (Subramaniam et al. 2021). Participating library staff from WI and RI will help to plan and facilitate these modules so that attendees learn from those who have first-hand knowledge of how to move forward in this work. Research staff will study the responses of participants during the trainings, and collect evaluation feedback to ascertain interest and uptake from the wider community. These online modules will live on and be available after the funding period for asynchronous use by staff and facilitated use by state library agencies and system leaders.

Documenting and analyzing uptake of tools and resources. As it develops products ready for widespread distribution through state and national networks, the TS4EDI project will monitor responses to direct offers made to association members. We will conduct surveys with a sample of respondents about their needs and interests. Surveys will be administered through emails in collaboration with associations, and brief interviews will be conducted virtually and at conferences. TS4EDI will test different communication strategies and track online traffic to relevant sites to analyze what drives traffic to the site and, by extension, infer what prompts interest.

Outcomes (year 3)

The project team will disseminate findings to advance the work of both practitioners and researchers. As a priority, findings from this work will be made widely available to the library community. The research will result in refinement of products and communication strategies. As a result, this work will have a broad impact on the methods used to engage and support teens in communities—large and small; tribal, rural, suburban and urban; and serving demographically diverse populations.

The project team will also disseminate findings in professional and academic journals such as *Information and Learning Sciences* and through conference presentations. Proposals will be submitted to the Connected Learning Summit, the YALSA Young Adult Services Symposium, the Public Library Association Conference and academic meetings such as the International Conference of the Learning Sciences. Staff participating in WI and RI will be encouraged to submit proposals and papers with the project team and will also be encouraged to submit articles and conference proposals to local, state, and regional library associations and agencies. Materials developed through this work will be available on the project website hosted by the Connected Learning Lab, which has extensive experience managing online resources and communications.

COVID-19 Contingency Plan

Where possible, thought has been given to which parts of this study can be conducted virtually without impacting the quality of work. We are able to alter the timing and location of research activities, such as interviews and observations, to address current COVID-19 conditions in a given area. We are hopeful that we will be able to conduct site visits in WI and RI in-person as public health policies allow, and as such, have budgeted for these trips to occur later in year 1 and year 2.

Personnel

The project team includes researchers and practitioners with expertise in CL, teen library services, and evaluation in informal learning settings. The project will be directed by Vera Michalchik, PhD, associate director of the Connected Learning Lab, UC Irvine, with support from Lab research specialist and project manager, Amanda Wortman, and a to-be-hired postdoctoral scholar. Library partners include Linda Braun, senior TS4EDI project advisor, who leads T3 and Future Ready, and active T3 cohort members Danielle Margarida (Rhode Island Office of Library & Information Services) and Tessa Schmidt (Wisconsin Department of Public Instruction). The advisory board includes CCLL co-PI William (Bill) Penuel (CU Boulder; Professor, Learning Sciences & Human Development) and ConnectedLib PI Mega Subramaniam (University of Maryland; Co-Director, UMD Youth eXperience (YX) Lab) who bring continuity with the current CCLL project and are leaders at the national level in research-practice partnerships, large-scale evaluations, and networks dedicated to increasing equity, diversity, and inclusion in informal learning spaces.

Evaluation Plan

At the beginning of the project, the core team (Michalchik, Braun, Wortman, Schmidt, Margarida, postdoc to be named) will develop a theory of change (ToC) that specifies goals, intermediate objectives, and strategies for attaining each objective on the way to our goals. We will also establish indicators aligned with the required IMLS performance measures that can help us assess our progress (see Table 1). Just as we might expect of our library partners, we will use this ToC to monitor our progress and make adjustments to our approaches and the ToC itself as needed, formally revisiting it at least quarterly. In this process we will generate a running list of questions to focus our formative, iterative process of improvement, consistent with the precepts of design-based research.

Our evaluation activities will be overseen by our advisors, Bill Penuel and Mega Subramaniam, both of whom have served key roles in CL projects. They will function as an external review panel, bringing to the role the highest levels of evaluation expertise in the substantive areas entailed in our work. In order to efficiently share our progress with our advisors and solicit feedback, we will structure the advisory input around our theory of change and the formative questions we ask, issuing bi-monthly written updates regarding our activities and achievements, our reflections on any challenges or revisions to our plans, and specific questions we would like the advisors to answer. Because the project is, at its core, a research project, a traditional evaluation would be less helpful than ongoing feedback on the design of the components, analysis of the data, and iterative planning for next phases of the research. Moreover, a research-practice partnership, necessarily built around testing the usefulness of tools and techniques, has many functions of program evaluation inherent in its structure.

Assessment of Risks

We identify risks specific to the TS4EDI project as follows:

Development of a robust research-practice partnership. Such partnerships require the building of shared vision, affinity, and a commitment to a common effort. The core RPP team and advisors have years of practice creating and sustaining such partnerships (Michalchik and Knudsen 2017; Penuel et al. 2018), and all members of the core team have collaborated previously. We therefore anticipate few threats of this type to the proposed project.

Time availability. Library staff have huge demands on their time and priorities that may take precedence over novel approaches. We have been able to mitigate these challenges in our other projects by establishing realistic parameters for this work with administrators at the outset, helping new participants manage the project's time demands, and designing the essential elements of the partnership to fit within the library staff's general workflow. We will use these approaches in TS4EDI as well as offer incentives to support participation.

Administrative buy-in. Gaining the support of library administrators may be a challenge, one that will require effectively communicating the value of supporting the project. This process will provide useful data regarding outreach to other administrators during our dissemination phase. We will provide stipends and keep administrators apprised of the status of our work, gaining understanding of how to best convey the resources the project develops. The state library agencies will bring particular skill and clout in gaining buy-in.

Staff turnover. Staff in the 3 to 5 libraries in WI and RI that we are working with may change jobs. We can mitigate this potential problem by cultivating additional library staff "ready in the wings" to work with us. These staff will also be positioned to respond to our piloting of surveys and interview protocols. Research staff may turnover as well. The postdoctoral scholar may receive an academic job offer or otherwise choose a new opportunity during the project.

Diversity Plan

The research informing CL principles and practices points to the many ways in which inequality in learning opportunity is tied to racial, ethnic, and economic background. The CL framework privileges cultural relevance and emphasizes the development of learning experiences that promote equity by centering the interests, relationships, and opportunities most helpful to minoritized youth (Ito et al. 2020). CL is particularly well-suited to the inclusive, informal, and youth-driven approach intended for teen programming in libraries.

TS4EDI is designed around close partnerships with WI and RI in part because these two states include increasingly diverse demographics among their tribal, rural, suburban, and urban communities. Their libraries act as hubs for those communities and vary in terms of size, resources, and staffing. Roughly 45% of WI's

under-17-year-old population is a member of a nondominant group, and these groups vary in ethnic and racial composition, spread across a moderately large state. Though small, RI nonetheless contains a mix of tribal, rural, suburban, and urban settings, and nearly one-third of the under-17 population is from a nondominant group. By working with WI and RI, the TS4EDI project will study and serve a microcosm of the larger US population. The project will be able to support library staff in each state by making their diversity goals more explicit and developing approaches for how they can best capture data to document their progress towards these goals. It will support youth from varied backgrounds to articulate their interests and needs, providing services to match, and brokering between activities and organizations that can advance their opportunities.

Our commitment to diversity is borne out in all aspects of the project design. TS4EDI's organizational collaborators—PLA, COSLA, and YALSA—engage geographically varied libraries from across the country. These collaborators are committed to serving all constituencies and will help bring our project outputs to national scale by disseminating our products through their networks. In producing our project's trainings, case studies, videos, and other resources, we will pay special attention to ensuring that every size of library and community is represented, so all library staff can see themselves as capable of providing successful teen services.

National Impact

Systematic testing of existing, refined, and new approaches designed for scale. Leveraging findings from research with 2 state library agencies, 6-10 collaborating libraries, dozens of respondents to survey and interview data, and several years of data and experience from three national-level projects, TS4EDI will result in the creation of resources adaptable to libraries serving teen patrons across geographies and demographics. The project will generate new program models, service modules for trainings, evaluative techniques, and outreach at local, state, and national levels.

Expansive dissemination. Several mechanisms for dissemination will be in place: e.g., national associations collaborating in this work will share products in their outreach and trainings; state library staff will present to colleagues in state library agencies through the T3 and Future Ready networks; the Connected Learning Lab will add to its highly popular CCLL video series to augment an improvement infrastructure for teen services. Importantly, the Connected Learning Lab's broad and sophisticated communications network includes platforms such as the Connected Learning Alliance and Connected Learning Summit, each of which are popular with teen library service providers. Beyond library associations, this work will attract the attention of youth service providers that can meaningfully partner with libraries to expand the ecosystem of connected learning opportunities for teens.

Enduring impact. This new learning and resource infrastructure will be integrated into capacity-building efforts by COSLA members and other library agencies and associations, with web-based videos, modules, tools, briefs, and other resources maintained and supported by the Connected Learning Lab and its collaborators, who will continue to develop the ecosystem of teen offerings. In addition to disseminating guidance for the field, these platforms will attract new interest, funding, and research-practice partnerships for building teen programs in service to equity, diversity, and inclusion across institutions. By bringing together the results, lessons, insights, resources, and stakeholders from three existing projects into TS4EDI, we will capitalize on and complete an important cycle of work for building an infrastructure to help continually improve and advance the ecosystem of teen services, of which libraries are an essential part. This work will assist libraries in realizing their new goals to serve non-dominant youth and their families more effectively.

Year 1 - August 1, 2021 - July 31, 2022												
Data gathering and planning	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
Hire full-time project postdoctoral scholar	■	■										
Write and secure IRB approval	■	■										
Monthly virtual meetings with key project personnel	■	■	■	■	■	■	■	■	■	■	■	■
Initial needs assessment/documentation review		■	■	■								
Analyze strategies, generate hypotheses			■	■	■							
T3 meeting in Reno, Nevada (COVID-19 travel policies pending)				■								
Develop research instruments				■	■	■						
Select and recruit interviewees (staff and youth)					■	■						
Interviews at 3-5 libraries in WI and RI						■	■	■				
Conduct surveys with broad set of library staff							■	■	■			
Site visits and participant observations									■	■	■	■
Preliminary analyses of first round interviews and surveys											■	■
Plan testing and iteration											■	■

Year 2 - August 1, 2022 - July 31, 2023												
Program development and testing	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
Monthly virtual meetings with key project personnel	■	■	■	■	■	■	■	■	■	■	■	■
Set criteria and recruit new interviewees	■											
Interviews (pre- and post-) with teen services staff, directors, and youth in participating libraries	■	■	■							■	■	■
Development of and administering trainings (modules, videos, guidebooks)			■	■	■	■	■	■	■	■	■	■
Coaching on teen programming implementation at partner sites				■	■	■	■	■	■	■	■	■
Surveys with wider set of staff and youth throughout WI and RI					■	■	■	■	■	■	■	
Ongoing analyses of interviews and surveys and iteration on pilots					■	■	■	■	■	■	■	■
Documentation of successes and challenges in the form of case studies and practice reports										■	■	■
Solicit library input on ideas for and drafts of practice reports											■	■
(Ongoing) Project website launched and resources added as they are made available	■	■	■	■	■	■	■	■	■	■	■	■

Year 3 - August 1, 2023 - July 31, 2024												
Resource production and dissemination	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
Monthly virtual meetings with key project personnel	■	■	■	■	■	■	■	■	■	■	■	■
Continue case study (5) development and publication	■	■	■	■	■	■	■	■	■	■	■	■
Continue practice brief (5) development and publication	■	■	■	■	■	■	■	■	■	■	■	■
Interviews/surveys with state agency and national association personnel to assess resource usefulness				■	■	■	■					
Develop video series and online training modules								■	■	■	■	
Update and maintain website	■	■	■	■	■	■	■	■	■	■	■	■
Work with partner associations and agencies to disseminate resources to their members	■	■	■	■	■	■	■	■	■	■	■	■
Production of research journal articles	■	■	■	■	■	■	■	■	■	■	■	■
Conference submissions and presentations (eg., Connected Learning Summit, YALSA Symposium, PLA, ICLS)	■	■	■	■	■	■	■	■	■	■	■	■

DIGITAL PRODUCT FORM

INTRODUCTION

The Institute of Museum and Library Services (IMLS) is committed to expanding public access to digital products that are created using federal funds. This includes (1) digitized and born-digital content, resources, or assets; (2) software; and (3) research data (see below for more specific examples). Excluded are preliminary analyses, drafts of papers, plans for future research, peer-review assessments, and communications with colleagues.

The digital products you create with IMLS funding require effective stewardship to protect and enhance their value, and they should be freely and readily available for use and reuse by libraries, archives, museums, and the public. Because technology is dynamic and because we do not want to inhibit innovation, we do not want to prescribe set standards and practices that could become quickly outdated. Instead, we ask that you answer questions that address specific aspects of creating and managing digital products. Like all components of your IMLS application, 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 digital products in the course of your IMLS-funded project, you must first provide answers to the questions in **SECTION I: INTELLECTUAL PROPERTY RIGHTS AND PERMISSIONS.** Then consider which of the following types of digital products you will create in your project, and complete each section of the form that is applicable.

SECTION II: DIGITAL CONTENT, RESOURCES, OR ASSETS

Complete this section if your project will create digital content, resources, or assets. These include both digitized and born-digital products created by individuals, project teams, or through community gatherings during your project. Examples include, but are not limited to, still images, audio files, moving images, microfilm, object inventories, object catalogs, artworks, books, posters, curricula, field books, maps, notebooks, scientific labels, metadata schema, charts, tables, drawings, workflows, and teacher toolkits. Your project may involve making these materials available through public or access-controlled websites, kiosks, or live or recorded programs.

SECTION III: SOFTWARE

Complete this section if your project will create software, including any source code, algorithms, applications, and digital tools plus the accompanying documentation created by you during your project.

SECTION IV: RESEARCH DATA

Complete this section if your project will create research data, including recorded factual information and supporting documentation, commonly accepted as relevant to validating research findings and to supporting scholarly publications.

SECTION I: INTELLECTUAL PROPERTY RIGHTS AND PERMISSIONS

A.1 We expect applicants seeking federal funds for developing or creating digital products to release these files under open-source licenses to maximize access and promote reuse. What will be the intellectual property status of the digital products (i.e., digital content, resources, or assets; software; research data) you intend to create? What ownership rights will your organization assert over the files you intend to create, and what conditions will you impose on their access and use? Who will hold the copyright(s)? Explain and justify your licensing selections. Identify and explain the license under which you will release the files (e.g., a non-restrictive license such as BSD, GNU, MIT, Creative Commons licenses; RightsStatements.org statements). Explain and justify any prohibitive terms or conditions of use or access, and detail how you will notify potential users about relevant terms and conditions.

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 data created by the project will be deposited in institutional repositories, and all research articles produced from the data will be published free, online on the Connected Learning Lab'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 data produced.

A.2 What ownership rights will your organization assert over the new digital products and what conditions will you impose on access and use? Explain and justify any terms of access and conditions of use and detail 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 beyond the Creative Commons license. 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 If you will create any products that may involve privacy concerns, require obtaining permissions or rights, or raise any cultural sensitivities, describe the issues and how you plan to address them.

We do not anticipate that content created will involve privacy concerns, require obtainment of permissions or rights, or raise cultural sensitivities.

SECTION II: DIGITAL CONTENT, RESOURCES, OR ASSETS

A.1 Describe the digital content, resources, or assets you will create or collect, the quantities of each type, and the format(s) you will use.

Research data will take the form of surveys, conversation notes, observation notes, and fieldnotes and stored as Word docs or Google docs. Surveys of librarians will be collected via an online portal and stored as spreadsheets. The online resource site will house PD videos, evaluation tools, cross-case analyses, and research reports. The toolsets, case studies and reports will be downloadable as PDFs, and videos will be hosted on YouTube, and downloadable by request.

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

All the hardware and software necessary for the creation of this content will be provided by the Connected Learning Lab at UC Irvine. The PI and research team will be using workstations provided by the CLL. The CLL licenses Microsoft Office products and Adobe Acrobat, which will be used to produce the resource materials. To facilitate analysis of interviews, observations, fieldnotes, and co-design sessions, the CLL provides a subscription for Dedoose Qualitative Analysis Software from: https://www.dedoose.com/. The online resource site will be hosted by the CLL and will most likely be produced using Wordpress.

A.3 List all the digital file formats (e.g., XML, TIFF, MPEG, OBJ, DOC, PDF) you plan to use. If digitizing content, describe the quality standards (e.g., resolution, sampling rate, pixel dimensions) you will use for the files you will create.

Survey data will be stored in .xls or .csv file format. Online resources created by the project will include file formats such as .pdf, .docx, .ppt and website 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 access them.

Workflow and Asset Maintenance/Preservation

B.1 Describe your quality control plan. How will you monitor and evaluate your workflow and products?

The PI will review all data and project products prior to release. The postdoctoral scholar will test all products prior to release and will monitor the website and address any issues that arise in tandem with the CLL's Communications Manager. Usability of the website and project products will be tested by partner librarians during development and upon launch/publication. Our team and partners have been collaborating since 2011, and 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. Your plan should address storage systems, shared repositories, technical documentation, migration planning, and 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 C.F.R. § 200.461).

Digital content produced by the grant will be published and maintained on the Connected Learning Lab's website, as well as partner's websites. As this project is aligned with other research and CLL work, the site is expected to be maintained and running for years. The CLL supports a Communications Manager with a long-term track record of supporting our affiliated faculty in maintaining access to research and educational products.

Metadata

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

Metadata in the form of topics and subject tags will be used to provide access to the online resources. A site map and menu on the project website will aid in navigating site content, as well as an integrated search option.

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

Metadata used on the website will be periodically reviewed by the PI, project manager, and CLL Communications Manager, including at least annually after the grant period of performance, and will update terms and the metadata schema as needed to ensure the site continues to be useful and navigable.

C.3 Explain what metadata sharing and/or other strategies you will use to facilitate widespread discovery and use of the digital content, resources, or assets created during your project (e.g., an API [Application Programming Interface], contributions to a digital platform, or other ways you might enable 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 via our partner networks like YALSA, PLA and COSLA. In addition, we will integrate search engine optimization into our website design.

Access and Use

D.1 Describe how you will make the digital content, resources, or assets 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, delivery enabled by IIIF specifications).

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, including mobile 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(s) and URL(s) (Universal Resource Locator), DOI (Digital Object Identifier), or other persistent identifier for any examples of previous digital content, resources, or assets your organization has created.

https://clalliance.org/publications/
https://clalliance.org/resources/evaluating-your-connected-learning-programs-and-spaces-video-series/
https://connectedlearning.uci.edu/research-tools/
https://sites.google.com/leonline.com/t3project/

SECTION III: SOFTWARE

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) it will serve.

N/A

A.2 List other existing software that wholly or partially performs the same or similar functions, and explain how the software you intend to create is different, and justify why those differences are significant and necessary.

N/A

Technical Information

B.1 List the programming languages, platforms, frameworks, software, or other applications you will use to create your software and explain why you chose them.

N/A

B.2 Describe how the software you intend to create will extend or interoperate with relevant existing software.

N/A

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

N/A

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

N/A

B.5 Provide the name(s), URL(s), and/or code repository locations for examples of any previous software your organization has created.

N/A

Access and Use

C.1 Describe how you will make the software and source code available to the public and/or its intended users.

N/A

C.2 Identify where you will deposit the source code for the software you intend to develop:

Name of publicly accessible source code repository:

N/A

URL:

N/A

SECTION IV: RESEARCH DATA

As part of the federal government's commitment to increase access to federally funded research data, Section IV represents the Data Management Plan (DMP) for research proposals and should reflect data management, dissemination, and preservation best practices in the applicant's area of research appropriate to the data that the project will generate.

A.1 Identify the type(s) of data you plan to collect or generate, and the purpose or intended use(s) to which you expect them to be put. Describe the method(s) you will use, the proposed scope and scale, and the approximate dates or intervals at which you will collect or generate data.

A variety of data sources will be collected for this project - including surveys, interviews, observation notes, fieldnotes, and recordings of co-design (PD) workshops, and the collection of materials and artifacts used as part of library-based programming. The goal of these various data sources will be to 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 collection activities are spread across the three years and are more fully described in the accompanying narrative for the project.

A.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. The PI has a proven track record for securing IRB approval of research and doesn't forsee any problems. The project team will submit an IRB protocol for the work upon notification of proposal funding.

A.3 Will you collect any sensitive information? This may include personally identifiable information (PII), confidential information (e.g., trade secrets), or proprietary information. If so, detail the specific steps you will take to protect the information while you prepare it for public release (e.g., anonymizing individual identifiers, data aggregation). If the data will not be released publicly, explain why the data cannot be shared due to the protection of privacy, confidentiality, security, intellectual property, and other rights or requirements.

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

A.4 What technical (hardware and/or software) requirements or dependencies would be necessary for understanding retrieving, displaying, processing, or otherwise reusing the data?

A computer with access to the internet and a web browser will be required to retrieve project data from the project website.

A.5 What documentation (e.g., consent agreements, data documentation, codebooks, metadata, and analytical and procedural information) will you capture or create along with the data? Where will the documentation be stored and in what format(s)? How will you permanently associate and manage the documentation with the data it describes to enable future reuse?

Interviews and observations 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 1 year after the completion of the data collection. Researchers will generate field notes following each type of data collection (interviews, focus groups, co-design sessions) to summarize findings and thoughts. These data will either be hand-written and scanned or created using Microsoft Word or a similar product. Codebooks will be generated by the research team to analyze qualitative data and imported into Dedoose to facilitate analysis. All files will be kept on password-protected computers in a folder only accessible to IRB-approved research staff.

A.6 What is your plan for managing, disseminating, and preserving 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 the CLL, typically 1 year after the completion of data collection, as required by the IRB. Resources, tools, and reports created from the data will be stored and managed indefinitely on the Connected Learning Alliance website and the websites of our partners.

A.7 Identify where you will deposit the data:

Name of repository:

Escholarship

URL:

escholarship.org/deposit.html

A.8 When and how frequently will you review this data management plan? How will the implementation be monitored?

This plan will be reviewed every 12 months to ensure all procedures for data protection are in place and to make any necessary updates based on new data collected. The implementation will be monitored by the research manager of the Connected Learning Lab, serving as the project manager of this project.