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SUSTAINING DIGITAL CURATION AND PRESERVATION TRAINING IN THE U.S.:

COMPILED PROJECT REPORTS



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1. Executive Summary

This report serves as a compilation of two reports produced in a one-year project, “Sustaining Digital Curation and Preservation Training,” which was conducted from July 2018 to June 2019, through the generous funding of the Institute for Museum and Library Services. In this compilation, we document a critical problem area we have been researching—namely, how to provide sustainable pathways for longer-term hosting of digital curation and preservation training materials and programming for library and archives professionals.

In this relatively brief, one-year project, we laid a strong foundation for future work. We focused our efforts on increasing relationships and partnerships between trainers, hosts, and funders of continuing education offerings, and on learning from each other’s experiences and observations. The net result of our work is summarized within this compilation, but it also actively lives on in our collaborative network of core project partners.

This report compilation opens with a brief introduction to the challenges in building, disseminating, and maintaining digital curation and preservation training content and programs. It then provides an overview of the project’s scope and methods, including the facilitation methodology that guided our two in-person project meetings, in which much of our discovery work took place. Finally, we provide synthesized documentation of our findings, including 1) experiences in trying to maintain training content and educational experiences over time, and 2) a set of options and pipelines towards sustainability that we believe that both we and other creators and hosts of projects that produce educational resources should consider.

2. Introduction

Over the last two decades, continuing education opportunities in digital curation and digital preservation have become crucial tools for advancing the skills of librarians, archivists, and curators in a quickly evolving information environment.¹ Such training resources are a primary avenue for information professionals who seek to increase and advance their knowledge and skills in this area. Competency listings document the knowledge and skills that digital curation and preservation specialists must master in order to serve their institutions and their patrons in a digital age.² Consortia, individual libraries, nonprofits, and for-profit businesses serving libraries and archives provide hundreds of institutes, workshops, online and blended training, MOOCs, and other offerings to help curation professionals to master these evolving digital curation competencies each year.

The increased number of training offerings on digital curation and preservation topics in recent years belies a structural challenge: In the U.S. context, continuing education opportunities for these relatively

¹ Gallinger, M. (2017) “Open Digital Preservation Training and Professional Development Opportunities.” Washington, D.C.: Institute of Museum and Library Services, Office of Library Services.

<https://www.ims.gov/sites/default/files/publications/documents/ims-2017-open-project-report.pdf>

² See e.g., OCLC WebJunction’s influential “Competency Index for the Library Field,” (2014)

https://www.webjunction.org/documents/webjunction/Competency_Index_for_the_Library_Field.html; Educopia and the Mapping the Landscapes project team’s “Self-Identified Library, Archives, and Museum Professional Development Needs 2016 Edition” (2016) <https://educopia.org/mapping-the-landscapes-2/>; and ACRL’s “Guidelines: Competencies for Special Collections Professionals” (rev 2017) <http://www.ala.org/acrl/standards/comp4speccollect>

new and fast-changing areas have been funded largely through federal and foundation grants. Many of these grant-funded training efforts are at risk of disappearing once they are no longer able to secure continued external funding, or once program staff move on to other initiatives. Even when these projects produce free, open, online continuing education materials, the need for funding still remains to enable ongoing updates both to the content and to its delivery platforms.

Currently, the field lacks clear pathways for identifying, building upon, and sustaining the training resources developed during grant projects. While recent studies have investigated sustainability in relation to digital collections development, digital humanities programs, and digital scholarship, to date there have been limited comparable studies of sustainability options for training resources and programs that support digital competencies.³ The present scenario, in which there are multiple, high-quality digital curation training offerings available for practitioners of different levels and needs, may quickly decline if grant-based funding is no longer available, or if key project personnel and stakeholders shift priorities.

To ensure our national investments in digital curation and preservation training have the greatest possible impact, we need to establish mechanisms and pathways for transforming grant-funded curricula and resources into ongoing, replicable training programs. We also need to strengthen relationships between existing trainers, hosts, and administrators of digital curation and preservation training programs, improving their knowledge of each other's offerings, emphasizing opportunities for complementary work, and fostering a network of support. Finally, we need better mechanisms to inform those seeking continuing education opportunities in these areas about what programs are available and what competencies they fulfill.

This report offers an assessment of the current state of digital curation and preservation training opportunities in the U.S., based on the experiences of 14 project partners who have built and maintained educational programming on these topics over the last 20+ years. We hope it will provide a foundation for future work to improve the long-term impact of and outlook for curriculum and resources that are developed within time-limited funding opportunities. This will serve to magnify the impact of the investments made by trainers, hosts, and funders, and will help provide crucial scaffolding to support our continually growing base of digital curators and preservationists nationwide.

3. Project Scope and Methodology

The "Sustaining Digital Curation and Preservation Training" project, conducted from July 2018 to June 2019, and generously funded by an Institute for Museum and Library Services Laura Bush 21st Century Librarian Program (LB21) grant, has involved leading continuing education (CE) stakeholders (trainers, hosts, and administrators) from LYRASIS, Northeast Document Conservation Center (NEDCC), Digital Preservation Management Workshop (DPM), Northern Illinois University (hosts of Digital POWRR), University of North Carolina at Chapel Hill School of Information and Library Science (hosts of DigCCurr, CRADLE MOOC, BitCuratorEdu), Educopia (host of ETDplus), Digital Preservation Network (DPN) and AVP (co-creators of the DPN Digital Preservation Curriculum), Sustainable Heritage Network (SHN), and OCLC

³ See e.g., Maron, Nancy and Sarah Pickle. "Sustaining the Digital Humanities: Host Institution Support Beyond the Start-up Phase." Ithaka S+R. Last Modified 18 June 2014. <https://doi.org/10.18665/sr.22548>; Maron, Nancy L., Sarah Pickle, and Deanna Marcum. "Searching for Sustainability: Strategies from Eight Digitized Special Collections." Ithaka S+R. Last Modified 20 November 2013. <https://doi.org/10.18665/sr.22647>.

WebJunction. Together, our team has worked to 1) document some of the key variables and existing approaches to sustainability in practice, and; 2) identify and document the critical elements needed to transition grant-funded curriculum into more sustainable training programs. This study has focused on the U.S., but we expect that many of our observations will resonate in other contexts as well.

The project's primary goal was to explore sustainability scenarios and relationships with a diverse set of stakeholders currently developing and/or providing continuing education resources on digital curation and preservation topics. To support this goal, we hosted two in-person project meetings in Chapel Hill, N.C., in Fall 2018 and Spring 2019. Our facilitated discussions from these events provided the materials for this report, including: descriptions of current training program structures and activities, current issues and challenges programs have encountered or anticipate, a set of critical elements to be considered in relation to transitioning grant-funded training curriculum and resources to other organizational environments, and recommendations for next steps. The project has produced a set of materials that focus on the bounded, high-need area of digital curation and preservation training sustainability; however, these materials will also serve as a model for how other topical training areas might address similar issues.

The core project activities focused on facilitating discussions and fostering relationships among project partners. Anne Ackerman, Sam Meister, and Katherine Skinner designed the structure and facilitation for both virtual (monthly) meetings and for the two in-person meetings.

Meetings were designed to promote conversation and bridge stakeholders, including several key groups: academic and government librarians, academic and government archivists, nonprofit-based curriculum specialists, and administrators. We used "Boundary Spanning Leadership" techniques (Center for Creative Leadership) to structure the overall interactions of the group.⁴ Rather than beginning with a "meshing" of these distinct stakeholder groups, we followed the Boundary-Spanning methodology by first **buffering** (building in-group identity for individual stakeholder groups), then **reflecting** (encouraging each stakeholder group to acknowledge and study the boundaries between them), **connecting** (forging relationships between individuals from different stakeholder groups), **mobilizing** (redrawing boundary lines that now include all stakeholders), and **weaving** (recognizing a common direction through bringing individual stakeholder strengths to bear on joint work).

Prior to the first in-person meeting, we hosted a series of virtual partner presentations, where partners provided concentrated overviews of their training programs, including each program's background and origins, funding model, current goals, target audience, and curriculum examples. This initial sharing of information built a foundation of understanding about program basics, and assisted in preparing partners for the more detailed discussions that took place at the first in-person partner meeting in November 2018.

The first in-person meeting was structured to enable fluid movement through the "Boundary Spanning Leadership" practices while also documenting concrete outputs through working sessions. The day was divided topically, and we worked through specific questions regarding 1) governance and organizational structures, 2) audiences (including gaps and under-represented groups), 3) curriculum and evaluation, and 4) challenges and obstacles. We then divided into small groups and worked on a specific example

⁴ Chris Ernst and Donna Chrobot-Mason. (2011) "Flat World, Hard Boundaries – How to Lead Across Them." MIT Sloan Management Review, <https://www.ccl.org/wp-content/uploads/2015/04/BoundarySpanningLeadership.pdf>

program, the ETDplus curriculum developed by Educopia Institute in 2016. In small groups, we evaluated the elements of the program and curriculum and developed sustainability scenarios for ETDplus.

The outputs from the initial in-person partner meeting, including a draft list of critical elements for sustainability, were further discussed, defined, and refined during monthly virtual meetings hosted between December 2018 and April 2019. Project partners were prepared to think about what content they most wanted to maintain or sustain, and what elements within their programs were negotiable or non-negotiable. They were also encouraged to begin thinking through long-term costs, not just for their own program(s), but for the overall digital curation and preservation training environment.

The second meeting was designed to provide each project partner with the time and structure to draft sustainability scenarios for its own work with grant-funded training programs. In most cases, individual librarians and archivists from research institutions were paired with organizational representatives of nonprofit organizations who manage continuing education programs (e.g., OCLC WebJunction, NEDCC, LYRASIS) to discuss the pros and cons of transitioning grant-funded curriculum into cost-recovery-oriented program settings.

4. Surfacing Issues and Challenges

At the first in-person partner meeting (November 15, 2018), partners engaged in exploratory discussions to surface the similarities and differences between their training programs. Prior to the meeting, the project team analyzed the virtual partner overview presentations, using these to identify specific focus areas around which we could most usefully structure our in-person discussions. The resulting focus areas included hosting structure, governance, audience, curriculum, and evaluation.

Partners were prompted with questions to guide their discussions around these focus areas, for example:

- How does ownership function?
- Who are your attendees?
- What lessons have you learned in producing curriculum?
- How is the curriculum/training program evaluated?
- What has been the impact of your training offerings?

The “Focus Areas” section of the report below represents a distillation of the partner overview presentations and the issues, challenges, and opportunities that were shared and documented during the in-person meeting discussions.

At the end of each focus area discussion, partners were encouraged to reflect on the discussion and attempt to identify what they thought were the critical elements for program sustainability in relation to the specific focus area. This draft list of critical elements for sustainability was one of the primary outputs from the initial partner meeting, and helped to frame the follow-on discussions that took place during additional virtual partner meetings over the next six months.

5. Focus Areas

5.1 ORGANIZATIONAL STRUCTURE AND GOVERNANCE

Project partner programs that create, maintain, and deliver digital curation and preservation training resources are often a unit or entity within a larger “host” institution. The relationship between host institutions and programs has a direct and lasting impact on program structure, staffing, funding, and governance. Project partners represented a wide swath of sectors (non-profit, for-profit, academic, government, etc.) and fields (libraries, archives, museums) as documented in the table below.

Sector	Field(s)	Organization-program	Individual(s)
Nonprofit	Libraries	OCLC-WebJunction	Sharon Streams
Nonprofit	Libraries, archives	NEDCC-Digital Directions	Ann Marie Willer
Nonprofit	Archives	Society of American Archivists (SAA)	Rana Hutchinson Salzmann
Nonprofit	Libraries, archives, museums	Educopia-ETDplus	Katherine Skinner
Nonprofit	Libraries, archives, museums	LYRASIS-Various workshops, courses, webinars	Annie Peterson
Academic	Libraries, archives, museums	DPN-Digital Preservation Workflow Curriculum	Mary Molinaro
For profit	Libraries, archives, museums	AVP-Digital Preservation Workflow Curriculum	Amy Rudersdorf
Academic	Libraries, archives, museums	MIT/Cornell-Digital Preservation Management Workshop	Nancy McGovern
Academic (previously government)	Libraries, archives	Pratt Institute, New York University- Digital Preservation Outreach and Education (previously Library of Congress)	George Coulbourne
Academic	Libraries, archives	Northern Illinois University- Preserving Digital Objects with Restricted Resources (Digital POWRR)	Jaime Schumacher
Academic	Libraries, archives, museums	University of North Carolina at Chapel Hill School of Information and Library Science-DigCCurr, CRADLE MOOC, BitCuratorEdu	Christopher (Cal) Lee
Academic	Libraries, archives	Washington State University - Sustainable Heritage Network	Kimberly Christen
Academic	Professional organizations serving libraries, archives, museums	Coalition to Advance Learning in Libraries, Archives, and Museums (CALLAM)	Martin Halbert

Our discussions included both our own experiences and those documented by our peers (e.g., “Open Digital Preservation Training and Professional Development Opportunities”). We determined that there are two main scenarios through which curriculum is designed and released using a time-bound funding source, e.g. a grant.

- 1) A research institution (usually a university) serves as the host for a grant- or contract-supported project, and the lead PI on the project is an employee of that host that usually *does the work of digital curation and/or preservation* for their institution(s). In such programs, either the institution works alone to build the curriculum (e.g., DPM) or the institution works with a collaborative set of partners (e.g., ETDplus or DigCCurr) to do so. Either way, full-time employees of the research institution(s) who are practitioners of digital curation and/or preservation often dedicate a portion of their time to develop the resources.
- 2) An organization (non-profit or for-profit) serves as the host for a grant- or contract-supported project, and the lead PI on the project is an employee of that organization that usually *focuses on continuing education as part of their job*. In these settings, the employee may be focused entirely on continuing education, or this may be one of several areas of work assigned to the employee. The PI often will contract with professor(s) or practitioner(s) to develop the curriculum, and that curriculum may then be offered for a fee (usually cost-recovery) or as open resources produced as research outputs (e.g., DPN Curriculum or WebJunction).

The pressure on the individual(s) who serve as the lead creator (and often grant-funded PI) to maintain curriculum is often high, fueled by steady demand for and interest in the outputs produced within a bounded project. Compounding this pressure, support from the institution is unlikely to include paid time to maintain or sustain the curriculum *unless that curriculum is generating revenue for the institution*. This is not due to any irresponsibility on the part of the institution, whether it is a research

Subsequent grants often promise new content or delivery mechanisms, thus increasing the total burden of upkeep, maintenance, and sustainability.

institution or an organization—it is due to the lack of a revenue stream that can support the staff time and energy ad infinitum.

The net result is that individuals often maintain content on volunteer labor and/or enter a cycle of applying for grants to support their continued work. Particularly with regard to the latter, because grants rarely fund “maintenance” work, each subsequent grant that promises new content or delivery mechanisms increases the burden of upkeep, maintenance, and sustainability.

Within the grant-funded context, many digital curation and preservation training projects name an advisory committee to help guide and steer the direction and shape of programs. These groups often play a role in early grant-funded stages of a program to advise on the initial creation and delivery of training resources. Some partners reported that as their program matured, they have moved away from having a standing advisory committee in place, in part to streamline operations with limited resources—the advisory group becomes one more group to manage and one more demand on the lead creator/maintainer’s time.

Other partners report that they have a specific group or team that provides oversight over all aspects of a training program. This usually materializes in environments where continuing education is an ongoing part of an organization’s work and service model. In these cases, the Advisory Board (or team/group)

provides crucial assistance in advertising and recruiting, and also in helping to set priorities and expectations around upkeep and maintenance of content.

Governance and organizational hosting of grant-funded curriculum plays a large role in what a curriculum is able to become over time. Most of the programs represented within this project group have remained within the same governance and hosting arrangement throughout the program's history. When transition is required (e.g., DPOE, which is successfully transitioning from a government host to a set of research institutions), it depends largely not on the institution (e.g., Library of Congress) but instead on the individual(s) who have built and maintained the program.

Issues and Challenges

During discussions, partners identified some issues and challenges related to creating and maintaining training programs. These issues often emerge based on the strength and formality of the connection between a training program and a host institution, whether this is an academic institution, non-profit, or for-profit organization.

Some partners reported that they worried about the potential for overburdening the human resources within their programs, particularly for those that are currently or recently dependent on grant funding. During early creation and piloting stages, core staff are relied upon to create the vision and goals, set up structural elements, and participate in the initial testing and piloting of training program resources. In some cases, these activities are carried out by existing FTE staff in addition to their other regular full-time employment duties (e.g., teaching, curation, or administrative tasks). The effort and energy required of a typically small project group may lead to committed individuals being overextended and eventually unable to continue the training program without additional staffing support. Partners noted that shifting from project-based to more structured programmatic activities, specifically allocating more resources to staffing, is necessary to increase overall program capacity.

Transitioning from a founder (or set of founders) to new program leadership was also highlighted as an important issue by project partners. This transition may be motivated by a range of factors, including the capacity issue described above, but also may be necessitated because a program leader has retired or changed positions and/or institutions. Leadership transitions are often challenging, especially if a program is strongly connected to a specific individual or champion as the external "face" of the program. If this champion was the driving force with a strong sense of the program vision, it can be difficult to maintain the program when that person leaves.

The relationship between host institutions and programs has a direct impact on program structure, staffing, funding, and governance.

Finally, the potentially tenuous relationship between host institutions and training programs was identified as a risk. Training programs that depend on host institution resources, such as staffing and administrative support, may have those resources decreased or removed completely with little or no forewarning if the host institution administration decides to shift its focus and/or determines that the training program is no longer a priority.

Case Study: Transitioning to a New Host Institution DPOE: Digital Preservation Outreach and Education

The Digital Preservation Outreach and Education (DPOE) program was founded in 2010 by the Library of Congress to “encourage individuals and organizations to actively preserve their digital content, building on a collaborative network of instructors, contributors, and institutional partners”. The program built a “Train the Trainer” curriculum (Nancy McGovern, lead designer), and an advisory board representing professional organizations, academia, state libraries, archives, and museums together developed DPOE’s founding objectives and helped refine its delivery methodology.

As the program became more established, a cadre of external, volunteer anchor instructors became DPOE’s most valuable assets. Essentially, the support of this external critical core group of committed professionals enabled DPOE to present both national and international workshops and to transition through several curriculum and delivery model iterations.

Initial funding support for DPOE came solely from the National Digital Information and Infrastructure Program (NDIIPP) and revolving gift funds managed by the Office of Strategic Initiatives (OSI). Following a 2015 reorganization at Library of Congress and the departure of key senior leadership, a majority of the funding directed to support DPOE was lost, requiring its staffing to engage new strategies to market, manage, execute, and fund DPOE workshops.

A second reorganization in 2017, coupled with the departure of DPOE’s founding program manager, inspired two long-time supporters of the DPOE program—the Pratt Institute and New York University—to engage in a proposal process to take on the management and hosting responsibilities for DPOE.

In 2018, this program successfully transitioned to the Pratt Institute and NYU, and its new hosts currently are establishing the DPOE-Network (DPOE-N) as a network of training resources available to cultural heritage professionals nationwide to enhance their digital preservation knowledge and skills, with a significant outreach and recruitment component. DPOE-N is motivated by the pressing need for library, archives, and museums to collect, preserve, and provide access to born-digital materials to fully reflect today’s digital world. At launch, it will take a different perspective from the original DPOE program in response to today’s variety of high-quality digital preservation education opportunities. DPOE-N will build upon its networked, coordinated model to serve rural and minority communities, which have received little previous attention.

Running DPOE-N as a distributed model in the near future should enable more diverse participation; it should also be more cost-effective since not all components need to be developed and run by the two key host institutions, eliminating the need for high hosting and travel costs.

5.2 CURRICULUM AND EVALUATION

Partner programs report many commonalities in their production, delivery, and evaluation of digital curation and preservation training curriculum.⁵ Most programs offer some form of in-person workshop or event, as well as online or virtual training opportunities. The formats for online delivery vary across programs, ranging from synchronous to asynchronous, and from single standalone webinars on specific topics to multiple-week courses. One of the primary drivers for the online delivery of training resources is to reach a wide audience, but partners noted that there are tradeoffs between in-person training delivery and online experiences. Many partners highlighted the importance of in-person events as a starting point for trainees to develop relationships with their peers, forming a network of support that can often extend beyond the workshop or training event. On the negative side, they also noted the cost-prohibitive nature of in-person events for many who need training opportunities.

Partner programs reported using different approaches to licensing and training resources. Partner programs situated in academic institutions all have adopted open licenses, which allow anyone to freely use and adapt training resources. Many of these openly available curricular materials have been produced through grant-funded research projects. Programs in partner nonprofit organizations report that they often keep licensing of training materials closed, especially for programs that pay instructors and that support administrative staffing lines. Other hybrid models exist, including one used by LYRASIS in which instructors who develop training resources for courses retain the rights to that content, but training resources produced by LYRASIS program staff remain closed. Similarly, when AVP creates content as a service for a client, the client retains the rights to that content. This approach was used, for example, when AVP was contracted by DPN to produce the Digital Preservation Workflow Curriculum. However, AVP retains rights to any training resources it has produced for its own courses and/or workshops.

Almost all programs utilize a post-training event evaluation to collect feedback from participants. Some programs incorporate other evaluation mechanisms, including pre-workshop surveys, in-person exit interviews for workshop series, and six-month follow-ups with in-person workshop participants. In addition, the Digital Preservation Management workshop has developed the Continuing Education Program Impact Assessment (CEPIA) Model, which provides a framework for overall training program assessment.⁶ Participant feedback from these evaluation mechanisms drive the assessment and updating process for almost all of the partner's programs. Some programs utilize comprehensive annual or bi-annual reviews where instructors and program staff review and update curriculum. One program (LYRASIS) conducts regular instructor reviews of specific course materials in lieu of annual comprehensive reviews, while another (OCLC WebJunction) does not conduct annual curriculum reviews due to limited funding support, but uses other strategies for updating and maintaining curriculum, as documented in the case study below.

Issues and Challenges

Project partners articulated a range of issues and challenges related to the creation, delivery, and assessment of training curriculum during discussions. Starting with terminology, partners identified the

⁵ Because it has been recently documented, we did not create a listing of curricula and what specific content is covered by different programs. For that information, please see Gallinger, M. (2017) "Open Digital Preservation Training and Professional Development Opportunities." Washington, D.C.: Institute of Museum and Library Services, Office of Library Services. <https://www.ims.gov/sites/default/files/publications/documents/ims-2017-open-project-report.pdf>

⁶ McGovern, Nancy, "Digital Preservation Management Workshop Continuing Education Program Impact Assessment (CEPIA) Model," https://dpworkshop.org/sites/default/files/DPMWorkshop-CEPIAModel_2017.pdf

Training offerings often have many titles, including “workshops,” “webinars,” “tutorials,” and “courses,” that may be confusing for trainees

need for clarity among training format definitions. Training offerings often have many titles, including “workshops,” “webinars,” “tutorials,” and “courses,” that may be confusing for trainees making decisions about what kind of resource will be most useful for their needs. Partners noted that creating a set of shared definitions would be beneficial in clarifying the distinctions among delivery formats and resulting learning outcomes and experience for participants. Keeping track of multiple versions of curriculum materials

was also highlighted by partners as a shared challenge. This is related to another shared issue—that of delivery formats—as the same baseline training content may be designed and delivered in different ways (e.g., webinars, self-paced courses, guided tutorials), each with variations on the content. Versioning approaches are also needed to document how training curricula have been updated over time.

Additionally, partners engaged in discussions on the topic of open education resources (OER), defined as “teaching, learning and research materials in any medium—digital or otherwise—that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions.”⁷ Partners noted that to be useful, the creation of OER should involve planning and producing supplementary materials, such as instructor guides, to be packaged with core curriculum materials. OER also need to be designed to allow for future customization and implementation in multiple delivery formats and settings. These kinds of preparation activities require additional resources beyond those dedicated to the creation of core curriculum materials.

Finally, there was a common recognition among partners that not all subject matter or content experts are skilled instructors. The needed skills for content and/or subject matter knowledge, instruction, and instructional design may require multiple people to meet identified needs, rather than one individual with a combination of those skills and experience. Partners also recognized a shared need to define baseline instructor skills across current training programs.

⁷ McGreal, Rory. Miao, Fengchun. Mishra, Sanjaya. “Open educational resources: policy, costs and transformation; introduction.” *Open educational resources: policy, costs and transformation*, UNESCO, 2016, Paris, p. 1-11, <https://unesdoc.unesco.org/ark:/48223/pf0000368316>

Case Study: Maintaining Curriculum Over Time OCLC WebJunction

The WebJunction program, hosted by OCLC Research, provides librarians with free training resources from an extensive course catalog that includes more than 300 webinars and self-paced classes. Some of WebJunction's offerings and learning content components are conceived and produced by WebJunction staff members; others are first developed by others and then are adapted and provided freely by WebJunction.

With hundreds of library-specific courses and webinar recordings, curriculum content maintenance is a crucial part of the program's work. Maintenance tends to be needed around two areas: (1) when the content becomes out of date, or (2) when changes in software "break" the content in some way (for example, self-paced courses that use an unsupported version of Adobe Flash).

A planning phase of development is used both for content created by WebJunction and content created by other organizations and hosted by WebJunction. During this planning work, WebJunction staff seeks to anticipate the level to which maintenance may be required for any given content, and then minimize their impact through design decisions. If a self-paced course, webinar archive, or curriculum does develop one of those two issues, then WebJunction staff use a range of factors (e.g., how popular the topic is and the level of usage of the content, whether the original content creator is still available and willing to make updates, the amount of time/effort/money needed to make necessary updates) to decide whether to update it or remove it.

Once WebJunction updates content, the original version is archived. For example, WebJunction's 2019 Supercharged Storytimes course is an updated and expanded version of an original course created two years previously. While the newer course version was being built, WebJunction phased out the old one by, first, closing the course for new enrollments, and then notifying people who had enrolled but not completed the course that it would be removed from the catalog by a certain date, so that they could finish it. Then, once the new version was online, WebJunction removed the old course completely. WebJunction follows a similar process when their clients wish to update or expand content that WebJunction hosts on their behalf.

Sometimes, WebJunction needs to update content designed by others. In such cases, WebJunction always tries to reach out to the Subject Matter Expert (SME) who created the original course to seek their input but, in some cases, they may be retired or have left the field. If they are no longer available or interested, WebJunction seeks new SMEs to inform the redesign. For example, WebJunction hosted a set of self-paced courses developed through a former Illinois-based program called LibraryU. These were very popular courses on basic library skills, but they started to show their age, especially in their design and usability. The LibraryU program and team was defunct by this time, so there was no one to fund or to complete the updates. Because these courses remain valuable and popular, WebJunction's learning community manager invested time to refresh six of the courses, providing both a visual improvement and new, more relevant examples.

5.3 AUDIENCE

The primary institutional audiences served by most partner programs are existing faculty and staff in libraries, archives, and museums. Some programs are intentional in the creation and delivery of training to specific audiences or sectors such as OCLC WebJunction’s course offerings for public libraries and the Sustainable Heritage Network’s focus on tribal libraries, archives, and museums. In terms of individuals, most partner programs focus on practitioners whose current or near-future responsibilities include curation or preservation of digital content, or who are looking to increase their knowledge and skills in this area. An exception is the Digital Preservation Management Workshop that focuses on managers and administrators, rather than on content curators.

As of 2013, the National Digital Stewardship Alliance (NDSA) reported that 75% of its responding organizations reported that they are retraining existing staff, rather than or along with hiring new staff, to undertake digital preservation and curation tasks.⁸ Demand for a wide range of training to address digital curation and preservation competencies is also evidenced through the 2016 survey of nearly 3,000 professionals—in libraries (1,215), museums and historical societies (758), archives (667), and other (197) curation environments, where “intermediate to advanced technology skills, digital collection management, and digital preservation competency areas received the highest percentage of respondents indicating a need for significant improvement.”⁹

Project partners discussed the high demand for offerings as an ongoing challenge, as practitioners often will sign up for any training that they can attend rather than carefully discerning what training is pitched at the appropriate skills/skill levels for their needs. An example of this was given by DPOE, a “train-the-trainer” workshop which is explicitly geared toward intermediate to advanced practitioners and is intended to *train attendees to become trainers* who will themselves then go out and teach basic digital preservation competencies. Each time DPOE has been taught, this specialized context has been deliberately marketed to its hosts and to its attendees; still, many of the attendees are there to learn basic digital preservation information, with no prior knowledge and no intent to become trainers in the future. For instructors, this type of disjunct between the advertised competencies and levels a session will address and the skills and needs of its attendees is deeply problematic, as it often leads to an unwieldy range of novice, intermediate, and advanced practitioners in the same course. Teaching to a mixed-knowledge group leads to frustrations for attendees and trainers alike, as there is no “common ground” to safely build upon.

...practitioners often will sign up for any training that they can attend rather than carefully discerning what training is pitched at the appropriate skills/skill levels

Issues and Challenges

In order to grow the profession’s balance in terms of diversity and inclusion, digital curation training has to be both available and utilized by diverse audiences that include currently marginalized and underrepresented groups. Training and knowledge can serve either as keys to enter the field, or as barriers that restrict a person’s work with digital content or infrastructures. Limited understanding of

⁸ Atkins, Winston, et al. (2013) “Staffing for Effective Digital Preservation.” <http://ndsa.org/documents/NDSA-Staffing-Survey-Report-Final122013.pdf>

⁹ Drummond, Christina and Katherine Skinner, eds. 2016. *Self Identified Library, Archives, and Museum Professional Development Needs 2016 Edition*. Atlanta, Georgia: Educopia Institute. p. 13. https://educopia.org/wp-content/uploads/2018/06/selfidentified_lam_professional_devel_needs_2016_0_1.pdf

audience demographics, including race/ethnicity, gender, age, education level, geographic location, accessibility needs, and other characteristics was noted as an ongoing challenge by partners. Most do not know the composition of their audiences due to limited collection of demographic data in evaluation mechanisms; the few that do tend to rely on self-reporting of demographic information by participants. Without more comprehensive demographic data it is challenging to identify where there may be gaps in what audiences are being served or not served by current training offerings.

As noted above, another challenge noted by partners was providing a good fit between the level of knowledge of attendees and the curriculum materials of a given event. Sometimes due to misperceptions or miscommunication about training prerequisites, attendees may select a training event that is either too basic or too advanced for their current needs. Some partners stated that instituting an application process helps with limiting the potential for this kind of mismatch, but it still may occur in some cases. Partners also reported that this kind of mismatch is increased in cases where attendees select in-person training events that are most convenient in terms of location, calendar dates, or length, rather than prioritizing training that would best fit their current needs.

Case Study: Translating Curriculum into Different Formats Digital Preservation Management Workshop

Digital Preservation Management Workshop (DPM) is a long-lived training program that has been consistently updated and revised and translated into different types of formats over the last 20+ years. It was initially developed by Ann Kenney and Nancy McGovern, then both at Cornell University.

The model for this training program was based on Kenney's prior work developing the Digital Imaging Workshop and Tutorial. McGovern and Kenney shifted the proven curriculum from a process-oriented approach for digital imaging to a program-centric approach for digital preservation. The core curriculum remains steady in its theoretical constructs, and the instructors use examples to supplement the core to keep it timely with relevant examples.

DPM intentionally developed a range of different workshop versions that appeal to different audiences and help with sustainability. There is a classic five-day version and a more portable three-day version that retains the core curriculum. Associated with these are two cost models—a registration-based option and a fee-based option. The registration-based option serves individuals who seek professional development to increase their skills, while the fee-based model supports institutional or consortial team building when one or more institutions want to build up their capacity to do digital preservation.

The DPM team produced a tutorial distillation of some of the core concepts of digital preservation in 2003, and this free web-based training resource is grounded in emerging and evolving standards and practice. Like the in-person training, the core of the tutorial remains steady and the team updates different sections incrementally, especially to feature recent developments or updates.

To sustain these versions, the DPM Workshop team undertakes a substantive update to all workshop materials once a year. Periodically, this includes shifting content from the workshop curriculum to the tutorial as topics become familiar enough to a majority of attendees. For example, early workshops included sessions on formats, but these were eventually shifted to the tutorial, enabling more time to focus on workflows and tools in in-person events.

In 2015, DPM added Digital Preservation Management Tools, a section of the website that serves much like a companion to the tutorial. It provides a space in which the DPM team can share key things digital preservation managers need to do in developing their right-sized sustainable programs—adopt principles, develop a policy, identify content, develop and document workflows, address disaster planning, and assess progress guided by prevailing standards and practice. The DPM tools provides a management tool, typically a framework with instructions, for accomplishing each one.

5.4 FUNDING MODEL

A mix of funding streams are currently utilized by project partners to support their programs, with many programs supported by grant-funding in some part, especially during early development stages. Some programs (SAA, LYRASIS) have well-established cost recovery mechanisms where revenues from training event registration fees are used to offset the costs of paying instructors, production of course materials, and other expenses. Others hold fast to providing open, free content, even if it means that the trainers stretch their own capacity and comfort level to accomplish this. For example, the Digital POWRR group has economized on all of its instructor travel, sharing rooms and staying with friends in order to stretch travel dollars and extend additional opportunities in additional locations.

Training programs that have been developed in response to specific audience needs are likely to be dependent on grant funding especially during the initial curriculum creation and piloting activities.

Training programs that have been developed in response to specific audience needs are likely to be dependent on grant funding especially during the initial curriculum creation and piloting activities. This funding model provides the support to offer training resources to targeted audiences at low to no cost, lowering barriers to access these resources. Across all partners, even those that are supported primarily by grant funding, in-kind contributions from institutional staff are relied on to carry out program activities.

Issues and Challenges

Simply stated, the primary challenge for many partners is ensuring ongoing funding support for training programs through public or private grant funders. As in other areas, most grant funding opportunities are focused on the development of new and innovative outputs, but there are limited options for programs seeking ongoing support for basic maintenance and updating of training resources.

As mentioned previously, when a PI does attempt to maintain a program through attracting additional grants, it creates a spiral of challenge. Each grant promises new deliverables—expanding content, delivery methods, audiences, and other components—and grants rarely provide any funding for upkeep or maintenance of previously developed materials. Thus, with each grant comes additional outputs that need sustainability attention that is not easily met unless a dedicated revenue stream is generated from the program.

Case Study: Transitioning Revenues from Grants to Self-Sustaining Sources LYRASIS

LYRASIS provides well-known training programs used by a diverse array of librarians and archivists in public, private, special, and academic settings. Historically, LYRASIS built some of its content using grant-based sources. However, to promote better predictability for the training program, it has recently transitioned its funding model, and it now maintains its training programs through ongoing revenue streams rather than time-bound soft funding sources. LYRASIS has accomplished this in part through updating its subscription model and building out a range of registration options for prospective trainees.

LYRASIS has successfully transitioned all of its training offerings from being grant supported to self-sustaining. The LYRASIS training program was always partially self-sustaining, and grant funding helped support providing subsidized rates to institutions for broader access. LYRASIS added a subscription model to support expanded access to classes across an institution and provide an alternate mode of registration from single-class registration for institutions.

Particular courses taught by LYRASIS may be short-lived (to meet an immediate need) or long-lasting. The longest-running LYRASIS course is an in-person disaster preparedness workshop that has been available since the 1980s. The class has lived on because it speaks to an ongoing part of the preservation field services librarians' positions. These positions were initially supported by the NEH with over 30 years of grant funding.

These course materials, like others at LYRASIS, are now maintained via shared drives of course materials with PowerPoint presentations, agendas, class materials lists, and notes on preparing for the session. The courses are updated each time they are taught in order to reflect newer ways of thinking and resources in disaster management for cultural heritage.

6. Sustainability Scenario Planning

The second in-person partner meeting, which took place on May 14, 2019, focused on sustainability scenario planning. Our primary goal was to provide the time, space, and framing for partners to think through and start to document how their current programs could increase their sustainability and/or prepare for potential transitions in their future. Partners were encouraged to think beyond their current situation and to imagine other possibilities, but also to ground their thinking and discussions in real-world, achievable activities.

Partners were divided into small groups to work through an exercise focused on discussing and documenting how a grant-funded training program could transition to a new host or a new model of operation. Each small (2-3 person) group consisted of a mix of partners representing programs from academic institutions, non-profit organizations, and/or for-profit entities. Specifically, each group considered how a grant-funded training program could transition via partnership with an academic institution, non-profit service provider, or a for-profit service provider. Partner groups were asked to draw upon their experiences with their own programs' transitions and decision points to respond to overarching questions and infrastructure specifics. These questions included:

- What exactly are we trying to sustain?
 - What are our strongest competencies?
 - What could we let go of?
 - What are the non-starters?
- How much will that sustaining cost?
- Does the environment support sustainability?

During the exercise, partners addressed these high-level questions in relation to specific focus areas of Mission/Vision/Values; Governance; Curriculum Design, Delivery, and Maintenance; Audience; and Funding Model. Outputs from the exercise were then shared in a large group discussion, including new issues and critical elements for sustainability identified during the exercise. These outputs have been integrated with the findings from the first partner meeting to expand and refine the critical elements for sustainability described below.

6.1 CRITICAL ELEMENTS FOR SUSTAINABILITY

Through a series of facilitated discussions conducted at two in-person meetings and monthly virtual meetings, project partners identified, described, and refined a set of critical elements that should be considered when seeking to improve and advance training program sustainability. This list is not intended to be comprehensive, nor did all partners reach consensus on all of the elements. Instead, this is a combination of perspectives brought by partners representing different roles, institution types, and program missions.

Similarly, this list is not meant to be a formula for ultimate success. There is no perfect model of program sustainability. Instead, these elements should be seen as suggested lenses through which training programs can evaluate themselves (or their peers), especially during moments of transition, to determine how best to move forward in continuing core functions and activities in support of their missions and goals.

6.1.1 Organization and Governance

- **Institutional Support**—The relationship between a host institution and training program has a direct impact on the current and future operations, and on the success of the program.
 - **Signals of sustainability include:**
 - Clear alignment between the mission of the host institution and the mission of the training program strengthens the case for ongoing support in the form of staffing and other resources. If the program can serve specific needs of the institution in addition to the profession at large, and that is documented in the institution’s strategic plan and in the training program’s mission, then this alignment becomes dependable and sustainable.
 - Documentation that describes the responsibilities of the institution, the training program, and the staff involved in the program provides insurance that even in times of institutional and administrative change, a program is likely to gain ongoing or transition-oriented support when needed. If the staff members who are participating have the training responsibility explicitly included in their job duties and in their annual evaluation, this work will be considered essential to their performance.
 - **Signals of potential danger include:**
 - The grant application is the only documentation in which the institution promises support for the training efforts. This leaves open the possibility that only the PI and other staff involved in the grant know or care about what is being created, and it increases the possibility that no one is ready to actually cultivate and care for the outputs once the funding dries up.
 - Only one individual on the grant is fully employed within the host institution and/or temporary workers are hired to provide primary support. When most or all of the work of a project is borne by limited-term contract workers or collaborative partners, its sustainability is questionable at best because the passion and care for the content is not distributed among staff who will be around to care for legacy materials over a long career.
- **Role of Champion(s)**—Individuals who play a significant role in the original design, development, testing, and initial implementation of a training program offer a level of knowledge and experience that is key to ensuring continuity of mission, principles, and operations as programs evolve.
 - **Signals of sustainability include:**
 - Continued, strategic involvement of such initial champions or their equally committed successors over time can provide stability during periods of change.
 - Encouraging new staff to become involved with the program, which brings new perspectives and fresh ideas and also embeds the activity more deeply within the organization.
 - **Signals of potential danger include:**
 - The initial champion(s) are involved in myriad projects and collaborations that pull upon their attention and bandwidth in ways that make extended care for a single program unlikely.
 - Champions are in tenuous or limited-term engagements that lead to a lack of predictability of the program’s future success.
- **Planning and Documentation**—Conducting risk assessments and establishing formal business plans are fundamental planning activities that training programs should undertake in early development stages and continue to update over time to be in a better position to adapt and

shift in response to changes in internal and external environments. Producing this documentation is also an opportunity to get administrative buy-in for the program, strengthening the case for continued support.

- **Signals of sustainability include:**
 - Documented exit plans that provide multiple steps and opportunities for the transition of the program to other groups within the institution or beyond the institution.
 - Clear, documented costs and impact metrics are projected, updated regularly, and reported upon in institutional reports, including reports to external groups (e.g., ACRL, ARL, SAA, or other professional associations), internal groups (strategic plan documentation), and/or staffing evaluations.
- **Signals of potential danger include:**
 - Disorganized documentation with no clear owner/responsible party, no clear audience, and no clear reporting schedule.
 - A lack of documentation, including within institutional documents (strategic plan, websites and other communications platforms) and HR reports (staff job descriptions and evaluations).

6.1.2 Curriculum Design, Delivery, and Maintenance

- **Demonstrate impact of curriculum**—A program’s ability to illustrate the value of training curriculum to increase individual skills and knowledge, as well as incrementally advance the practice of digital curation and preservation across cultural heritage institutions, are key factors for ongoing program success.
 - **Signals of sustainability include:**
 - Clarity and consistency in program descriptions and advertising, with an entry questionnaire or process for prospective attendees that helps to cull the audience into the intended skill level and needs.
 - Assessment data that is collected, maintained, and used to tell stories that clearly demonstrate the impact of curriculum and that include some type of external reviewer perspective.
 - **Signals of potential danger include:**
 - Disorganized data that is not collected rigorously or reported anywhere regularly.
 - No feedback mechanisms are made available to participants.
- **Support for regular curriculum review and updating**—The practice of digital curation and preservation is rapidly changing, therefore the regular review and updating of training resources is critical for meeting the needs of trainees.
 - **Signals of sustainability include:**
 - Ongoing review and updating of curriculum are a core function of training programs and bear their own funding line/staff time.
 - An advisory board or editorial group including both internal (program based or institution based) members and external voices helps to oversee and audit/evaluate the curriculum over time, recommending updates and additions as needed.
 - **Signals of potential danger include:**
 - Multiple grants undertaken or applied for in quick succession with little to no institutional funding or sunk-cost commitment supporting the work.

- A large body of curriculum resources produced and/or promoted in multiple formats without dedicated staffing or infrastructure.
- **Cultivate instruction expertise**—The people with the role and responsibility to deliver training curriculum in in-person and/or online settings have a significant impact on the learning experience of trainees. Defining and cultivating expertise in instruction to ensure high quality learning experiences should be a core component of training program activities.
 - **Signals of sustainability include:**
 - Passionate instructors who have ongoing practitioner experience and are able to keep up with the quickly changing field of digital curation.
 - Additional instructors are regularly “groomed” or incorporated into trainings and bring new skills and ideas. These instructors sometimes become part of the core team.
 - **Signals of potential danger include:**
 - A single PI or small instructor pool of individuals who are overtaxed with commitments and/or no longer engaged in day-to-day practice or research in digital curation.

6.1.3 Audience

- **Partner with member-based organizations to reach specific audiences**—Identifying and building relationships with member-based organizations, such as professional associations, provides an opportunity to increase the reach and delivery of training resources to groups that have common alignment.
 - **Signals of sustainability include:**
 - Successful partnerships between trainers and organizations/associations require a high degree of clarity and transparency around expectations, especially regarding how such training is to be advertised, delivered, and remunerated.
 - Instead of duplicating work, partnerships enable an association and an instructor/curriculum base to customize training resources for specific audience needs, increasing the potential value and impact of these resources.
 - **Signals of potential danger include:**
 - Disconnection from other training groups who offer similar training experiences.
 - Disconnection from professional associations and communities who need and/or want training experiences for their constituents.
- **Embed inclusivity and diversity aims in program mission**—Recognizing the current lack of comprehensive demographic data on trainees, we documented a shared understanding among project partners that many groups have not had the same level of access to digital curation and training resources. Some of these groups include marginalized and underrepresented people and communities; others include those located in specific geographical areas.
 - **Signals of sustainability include:**
 - Embedding intentional goals in the mission and objectives of training programs to collaborate with and provide training resources for underrepresented and/or marginalized communities.
 - Prioritizing the accessibility of online and asynchronous training content increases potential for access by individuals with different abilities and in hard-to-reach geographical locations.
 - **Signals of potential danger include:**

- Content is not regularly assessed for accessibility standards compliance, and new content is created without such compliance.
- Outreach is limited to traditional channels, including listservs on the topic of digital curation. These often reach those who have already managed to enter the field, but not those who may want to pursue digital curation but who do not know how or where to begin this process, including historically marginalized and underrepresented groups.
- **Foster peer-to-peer networks among trainees**—Trainees often remark that the connections they have made with fellow practitioners at training events have been one of the most valuable outcomes of the experience. These connections and the network of support beyond an initial training event should be encouraged and facilitated by programs, but this work is often unfunded and relies entirely upon volunteer labor from trainers or organizers.
 - **Signals of sustainability include:**
 - Work to build and sustain relationship networks is a *core, funded* activity within training opportunities for libraries, archives, and museums.
 - Networks of engagement are used to track the longer-term impact of training, showing how practitioners with access to a peer-based arena will be inspired and motivated by each others' stories about implementation.
 - **Signals of potential danger include:**
 - Attendees lack of engagement with unmonitored and unsupported communications channels is taken as proof that this engagement is too challenging to support instead of recognized as something that takes work to promote and cultivate.
 - Attendees leave events without any ready way to communicate with the trainers and their co-attendees.

6.1.4 Funding Model

- **Pursue multiple, diverse revenue streams**—Programs that rely on a single revenue source (e.g., grant-funding) to fund their activities are at risk of discontinuing operations if that revenue source is no longer available.
 - **Signals of sustainability include:**
 - A blended mix of revenue sources, including such streams as fee-based delivery services, philanthropic fundraising, institutional budget lines, and grant funding support the training resources over time.
 - A clear budget is maintained, monitored, and updated for the training activities and is shared with partners and the host institution regularly.
 - **Signals of potential danger include:**
 - Single-stream revenue or unfunded volunteer labor is depended upon for most or all of the program's continuity over time.
 - Gaps between grants leave core programmatic activities unfunded.
- **Funding for dedicated program staff, including long-term employees**—The nature and variety of tasks involved in program operations should be fulfilled in part by staff who are in a position to maintain the institutional host's commitment and to focus even a small portion of time and energy on the growth, development, and delivery of core program functions in response to evolving audience needs.
 - **Signals of sustainability include:**

- Permanent staff members are engaged in the project, not as a volunteer activity, but with explicit job responsibilities that are documented and evaluated annually.
- Limited-term employees hired into the project via grant funding are provided with access to and engagement with local institutional staff who value the work that the program is accomplishing.
- **Signals of potential danger include:**
 - Pockets of grant-funded activity are completed by a mix of institutional and limited-term employees in isolation from the institution's larger body of staff.

7. Conclusion and Next Steps

The Sustaining Digital Curation and Preservation Training Project initiated an effort to better understand and develop approaches for increasing the sustainability of training programs focused on providing needed digital curation and preservation skills, knowledge, and experience to 21st century librarians, archivists, and other cultural heritage professionals. This initial, one-year planning project focused on starting the conversation. By convening a group of representatives from leading training programs to share detailed information about current program structures, activities, and goals, we have fostered new relationships among these individuals and organizations, including illustrating their similarities and differences. Through a series of in-person and virtual facilitated discussions, project partners deepened their understanding of the issues and challenges shared across training programs, and found common ground through identification of these pain points. The shared nature of these issues indicates that continued collaboration and crosstalk among training programs may help in making progress to resolve the challenges many programs are facing.

This project has laid the groundwork to continue these collective efforts and launch new projects or initiatives. By identifying and defining a set of critical elements for sustainability, project partners have articulated a shared vision for the core areas and factors that all organizations should consider when seeking to improve and/or advance the sustainability of their training programs. The discussions that resulted in the development of these critical elements focused on determining how primarily grant-funded training programs could transition towards more stability, but the elements have potential application at both earlier and later stages of program development and maturity. This project has not produced a formal model, or step-by-step guide describing the sequence of activities that training programs should implement to achieve greater levels of sustainability. As in other areas, a one-size-fits-all approach doesn't make sense for increasing training program sustainability, nor was this kind of approach desired by project partners. Instead, the building blocks produced by this project have the potential to be refined, combined, and added to in future projects and/or initiatives.

Project partners continually expressed that one of the most valuable aspects of participation in the project was the relationships that have been built and strengthened with other individuals invested and committed to improving and advancing digital curation and preservation training programs. Partners also articulated multiple ideas for future projects and next steps that could build upon the relationships they have formed including:

- Developing case studies of sustainable training programs
- Strengthening relationships through ongoing communication and information sharing

- Partnerships between specific programs to pilot transitioning from grant-funded projects to formal programs
- Creating a comprehensive inventory of training programs

All of these directions would further advance efforts around digital curation and preservation training program sustainability, benefiting an array of stakeholders, including trainers, trainees, program administrators, and funders. We are excited about the energy that the individual partner representatives brought to this project and look forward to seeing continued momentum in future endeavors.

As an organization that seeks to empower institutions to utilize collaborative approaches to take on complex issues, Educopia was eager to help coordinate and facilitate the valuable discussions that took place during this project. Many of the potential future projects identified would benefit from, and may even require, an entity to help coordinate and support these continued efforts. Organizations such as the Coalition to Advance Learning in Libraries, Archives, and Museums (involved in this initial effort), or the National Digital Stewardship Alliance (in which most of our partners, as well as us, are members) would be well positioned to play a role in helping to coordinate future efforts. Significant progress was made during this project, and there is strong interest, need, and motivation from multiple players to continue advancing this work.

8. Acknowledgements

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