

Abstract

The NCSU Libraries, KU Libraries, and UIUC iSchool will explore the need for and the ideal components of an open educational resource (OER) for teaching library and information (LIS) students and professionals about scholarly communication. Because scholarly communication is recognized as a core competency for librarianship, librarians need to understand the topic, but there is currently no unified educational resource available for training and continuing education. Scholarly communication is interdisciplinary and quickly-evolving, which makes it difficult to create a standard commercial textbook that will prepare librarians to be leaders in the field. Instead, we propose a collaborative OER that gathers contributions from librarians as well as experts in relevant areas such as law, economics, and publishing. The intent of the proposed project is to gather information about the practices and needs of instructors and learners in this space and develop a clear set of topics, contributors, and case studies for an OER. The project will also begin to develop a community of practice to support the development and sustainability of an *OER of Scholarly Communication*.

In consultation with stakeholders such as the ACRL, SPARC, Library Publishing Coalition, and Open Textbook Network, the PIs will design and conduct a nationwide survey and engage directly with the two central stakeholder groups: LIS instructors and scholarly communication experts. Engagement with LIS instructors will be done through focus groups held at the Association for Library and Information Science Educators (ALISE) annual meeting in Denver, CO on February 6-9, 2018. We will then hold an unconference of scholarly communication experts designed to address these issues through working sessions that gather reflections and suggestions about the optimal design and content of our OER. This gathering will also help develop a community of practice and identify a list of contributors for the final OER and coordinate their participation in developing an *OER of Scholarly Communication*. The project will be conducted from October 1, 2017 through September 30, 2018, in the following three phases: (1) a planning and preparation phase; (2) a survey and direct engagement phase; and (3) an evaluation, reporting, and dissemination phase.

This research addresses the IMLS project category of a National Digital Platform by focusing on the foundational work needed to improve our understanding of user needs in scholarly communication education and the value of an OER as a tool to meet those needs. These activities will identify the extent to which such an OER is needed, the components of the OER, the potential obstacles to its adoption, and the partnerships and promotional activities that would accelerate its use. The outcomes of this planning project include a final report and open research data, as well as the materials and relationships for creating an OER that can meet those needs. The project findings and this data will help a broad range of scholars, students, librarians, and publishers better understand what supports are needed and meet a pressing need for new librarians to engage in scholarly communication work.

NARRATIVE

1. STATEMENT OF NATIONAL NEED

Support for scholarly communication has evolved from a niche issue to the heart of librarianship as a profession in the second decade of the twenty-first century. Finlay, Tsou, & Sugimoto identify it as a “core concept” for academic librarianship,¹ and professional organizations such as NASIG² and ACRL³ have developed definitions of core competencies and toolkits to assist librarians in developing requisite skills. An increasing number of librarians are taking dedicated roles as “scholarly communication librarians” focused on topics like copyright, publishing, support for open access, open data, and open education. Many more librarians are absorbing these roles into their responsibilities regardless of their titles. Given the rapidly shifting cultural, technological, and economic scholarly terrain, this growth is likely to continue.

Because scholarly communication is a core competency, academic librarians must understand these issues, especially early career librarians who hope to compete in a difficult job market, and many of whom will be expected to be researchers in their own right. Yet, library schools have thus far largely failed to take up equipping emerging librarians with these increasingly necessary skills at any scale, despite the breadth and depth of relevant literature available. Why is this the case? Given that there is a great deal of rich literature by and about scholarly communication librarians and their work, and that these skills are clearly needed in the present and prospective job market, why are so few relevant courses offered in MLS programs?

Many library school professors have never practiced scholarly communication librarianship, and therefore may lack expertise or comfort in the discipline as it is practiced. Because there is no unified, cohesive, and comprehensive educational resource, as there is in other areas such as information organization or digital libraries, instructors, students, and continuing learners must navigate the excellent but disparate literature in all its aforementioned breadth and depth, and without editorial oversight to pull it all together. While resources such as the NASIG Core Competencies and ACRL Toolkit inform our approach and the products we propose to create, we want to understand why these tools have thus far resulted in so little pedagogy around scholarly communication librarianship, and to create a tool that addresses the gap.

One significant factor is that scholarly communication is both interdisciplinary and quickly-evolving, which makes it difficult to create a standard commercial textbook that will prepare librarians to be leaders in the field. Such a product would be too rigid, restrictive, and probably too expensive. It would also be outdated before the ink was dry. Instead, we propose a collaborative, iterative open educational resource (OER) that gathers contributions derived from the lived experience of librarians, instructors, and students, as well as experts in related areas such as law, economics, and publishing. This model leverages the potential of what the

¹ <http://doi.org/10.7710/2162-3309.1236>

² http://www.nasig.org/site_page.cfm?pk_association_webpage_menu=310&pk_association_webpage=9435

³ <http://acrl.libguides.com/scholcomm/toolkit/home>

NMC Horizon Report 2017 *Higher Education Edition* describes as a “blending of formal and informal methods of teaching and learning [that] can create an education environment that fosters experimentation, curiosity, and above all, creativity.”⁴

The intent of this proposal is to gather information about the practices and needs of instructors and learners in this space and to develop clear sets of topics, contributors, and case studies for an OER of scholarly communication that speaks to the needs of those populations and invests them in its creation, use, and maintenance. This research will also be informed by a current IMLS-funded project, the *Open Textbook Toolkit* (LG-72-17-0051-17), which is investigating the practices and needs of psychology instructors who are considering adoption of OER. While that study is focused primarily on understanding technical and administrative barriers to adoption of OER, rather than the substantive work of developing a community-focused OER for LIS, the research outcomes of the *Toolkit* will provide important insight into potential challenges for this project.

This research addresses the IMLS project category of a National Digital Platform by focusing on the foundational work needed to improve our understanding of user needs in scholarly communication education and beginning to develop the infrastructure and community necessary for an OER as a tool to meet those needs. These activities will identify the value of such an OER, as well as the components of the OER, the potential obstacles to its adoption, and the partnerships and promotional activities that would accelerate its use. The outcomes of this planning project include a final report and open research data, as well gathering many of the materials and relationships for creating an OER that can meet those needs. The project findings and this data will help a broad range of scholars, students, librarians, and publishers better understand what supports are needed and meet a pressing need for new librarians - and librarians new to this discipline - to engage in scholarly communication work.

We also hope to better understand how our project may be a model for librarians in other disciplinary roles to have stronger representation in how the theory and practice of their work is taught to their future colleagues in library schools by developing similar tools in their own spaces. While librarians and libraries are a major force in the open education movement, we frequently still learn from conventional textbooks, or perhaps more commonly, don't learn from them, because of access barriers. Decreasing these barriers may well play a role in helping to address the alarming lack of diversity in our profession.

2. PROJECT DESIGN

2.1 Goals & Outcomes

We are seeking IMLS support in order to fully collaborate with the key stakeholders in library instruction and scholarly communication in conducting a needs assessment and gap analysis for educational materials that prepare librarians to work in scholarly communication. We will gather this information from instructors and professionals through an environmental scan and

⁴ <https://www.nmc.org/publication/nmc-horizon-report-2017-higher-education-edition/>

targeted engagement with LIS instructors at their annual conference and with scholarly communication practitioners at an invited unconference. The aspiration of this phase of the planning project is to identify and articulate areas of interest and need in our stakeholder communities and best approaches to meeting those needs, including identifying key contributors and selecting the best means and media for OER delivery for these communities. We will emerge from this planning phase with a clear road map to creation and dissemination of the resource.

2.2 Phase 1 - Planning & Preparation

Our attention will first be directed toward the PIs working with each other and with a group of advisors to identify the stakeholder groups whom we wish to reach. We anticipate that at a minimum these will include LIS students, LIS instructors who teach classes germane to scholarly communication, recently hired professionals with scholarly communication responsibilities, and disciplinary scholars who seek support from libraries to maximize the effectiveness and reach of their scholarship. In tandem, we will delineate the most important areas of investigation and develop a survey that maps questions to those areas, at the same time doing due diligence to ensure that we have addressed any possible implications for human subject research. We will also begin preliminary planning for in-person engagement with LIS instructors and scholarly communication professionals.

2.3 Phase 2 - Survey and Engagement with LIS Instructors and Scholarly Communication Professionals

Our intent is to identify the most important areas of scholarly communication literacy and awareness vital to professionals, both aspiring and established, who engage in developing and sustaining a robust scholarly communication environment. To this end, we will conduct a national survey of LIS professionals, both educators and practicing librarians with scholarly communication responsibilities. The survey will be delivered online, and we will mobilize our professional networks, the library and iSchool communities, and relevant listservs to recruit participants. Our goal is to hear from at least 100 respondents. Survey analysis will result in both narrative summation and reflection and, as appropriate, in visualizations of the survey data. We will share our data to the greatest extent possible.

Informed by this environmental scan, we will conduct meetings with the two identified stakeholder groups: LIS instructors and scholarly communication professionals. Engagement with LIS instructors will be done at the Association for Library and Information Science Educators (ALISE) annual meeting in Denver, CO on February 6-9, 2018. This event will be conducted in the style of a focus group, using a series of semi-structured interviews to drill down into the information identified in the survey and explore the needs of instructors.

In spring 2018, we will host an unconference event held on the North Carolina State University campus. One possibility for this event would be to partner with the Scholarly Publishing and

Academic Resources Coalition (SPARC) in order to frame it as an OpenCon Satellite. Satellite events are described by SPARC as combining “content, themes and ideas from the main OpenCon 2017 meeting with locally arranged activities. They provide the perfect opportunity to begin discussions and catalyze local progress on Open Access, Open Education, and Open Data while staying connected to a global movement.”⁵ Whether framed as an OpenCon Satellite or as a different type of event, we will encourage open participation at the event, but also issue special invitations to a number of scholarly communications professionals. In addition, we will bring in two expert keynote speakers/facilitators to work with the co-PIs in leading discussion. Potential speaker/facilitators identified include Kevin Smith, Dean of Libraries at the University of Kansas and Cassidy Sugimoto, Associate Professor of Informatics at Indiana's School of Informatics and Computing, but other names are likely to be generated by the survey.

While we will use the meeting as an opportunity to address the questions embedded in our earlier engagement, we also hope to take advantage of the convergence of expertise to hold working sessions to garner reflections and suggestions about the optimal design and content of our OER. This event will also begin to weave together the community needed to make this OER a successful, diverse, and sustainable project. At the conclusion of this investigative phase, the PIs plan to meet and compose a narrative report and to plan for the next steps in developing the OER.

2.4 Phase 3 - Evaluation, Reporting, and Dissemination

LIS instructors', researchers', and scholarly communication communities' engagement with the results of the proposed research and eventual adoption and use of the OER will define the success of this planning project. Findings of the project will be distributed at LIS and open culture conferences and published in peer-reviewed journals. The generated datasets will be anonymized, deposited with an open data repository, and distributed freely so that interested researchers and practitioners can replicate the study, evaluate the validity of the project's outcomes, and/or use them in the development of guides and policies.

The PIs expect that the qualitative data generated by the planning project will be rich enough to warrant formal publication and will seek appropriate professional venues for that publication. The work will certainly result in an openly accessible white paper distributed through the respective IRs of the PIs as well as through any web resource developed in conjunction with the OER. We will also generate and share a plan and a schedule for the next phase of OER creation, a plan that includes identification of any resources for which we may need to locate funding.

2.5 Diversity

The project team will ensure a broad diversity of participant samples for the survey within the limits of the target population of scholarly communication students, instructors, and experts, and the amount of information available about the demographic characteristics of potential participants. The ALISE focus groups and unconference event will be designed to draw from a diverse set of academic institutions and stakeholders.

⁵ <http://www.opencon2017.org/satellite>

2.6 Project Resources: Personnel, Time, Budget

Key Personnel/ Project Leads:

Josh Bolick (Principal Investigator) is the Scholarly Communication Librarian in the David Shulenburg Office of Scholarly Communication & Copyright at KU Libraries where he supports a broad range of scholarly communication needs across the university. He leads the KU Libraries OER Initiative, which has seen explosive growth under his direction, including a \$50K OER grant program to incentivize and support OER use through small grants. Recent scholarship includes advocacy for open access in wildlife management literature, exploiting a loophole in Elsevier's author sharing policy to subvert institutional repository embargoes, and participating in the framing and execution of the Envisioning a World Beyond APCs Symposium in November 2016, which questioned the APC-funded OA shift proposed by Max Planck and others. As a Presenter for the Open Textbook Network, Josh travels to member institutions to train librarians, instructional designers, and other staff how to support open textbook adoptions.

Maria Bonn (Principal Investigator) is a teaching professor at the School of Information Sciences at the University of Illinois Urbana-Champaign. She teaches courses on the role of libraries in scholarly communication and publishing as well as a course in academic librarianship. Prior to her teaching appointment, Bonn served as the associate university librarian for publishing at the University of Michigan Library, with responsibility for publishing and scholarly communications initiatives, including the University of Michigan Press and the Scholarly Publishing Office. She has also been an assistant professor of English at institutions both in the United States and abroad.

William Cross (Principal Investigator) is the Director of the Copyright and Digital Scholarship Center in the NCSU Libraries where he provides guidance to campus stakeholders on legal issues and open access to scholarship, data, and educational resources. He also serves as an instructor in the UNC School of Information & Library Science, teaching an annual graduate-level course on *Legal Issues for Librarians* and lecturing on various scholarly communication topics in LIS courses. Since 2014, Will has led the NCSU Alt-Textbook project, a nationally-recognized program that supports open pedagogy and student success.

As the Presenter Coordinator for the ACRL Scholarly Communication Roadshow, Will guides the program and has led daylong workshops in twelve states and provinces across North America. He serves on the advisory board for the Mellon-funded Triangle Scholarly Communication Institute and is currently co-PI on the Open Textbook Toolkit, an IMLS grant-funded project to explore the needs of instructors as they develop OER. (LG-72-17-0051-17).

Budget: The proposed budget for this planning project includes salaries and fringe benefits for all three Principal Investigators for 5% of their time over the course of the project year (total of **\$11,822**) as well as funding for a graduate student to administer the survey and support planning and delivery of the unconference event (**\$3,000**). Travel funding is also included for

the PIs to conduct focus groups at the 2018 ALISE Annual Conference in Denver, CO. This trip is budgeted for airfare, hotel, meal per diem, conference registrations, and local transportation. PI travel is budgeted at **\$4,905** for three trips in total. The proposed budget also includes funds for the unconference event, including **\$1,905** for food and **\$2,060** to support attendance by two keynote/facilitators. The indirect costs of NCSU are assessed against the total direct costs of the project at 33.6%. Sub-awardees calculate indirect cost at 34% (Kansas) and 58.6% (Illinois). Total indirect costs are **\$19,478**. The total requested budget from IMLS for this planning project is **\$49,808**.

Timeline: The project will be conducted from October 1, 2017 through September 30, 2018, in the following three phases: (1) a planning and preparation phase; (2) a survey and direct engagement phase; and (3) an evaluation, reporting, and dissemination phase. Dissemination and communication of the project findings and data will continue past the project completion date. Details for the project phases are provided earlier in the project design section and broken out in the Schedule of Completion document.

3. NATIONAL IMPACT

The proposed project addresses a significant need for library instruction and scholarly communication work across the profession. Scholarly communication is undergoing ongoing, dramatic transformation, driving change throughout the research lifecycle, and librarianship is changing with it. As a result, formats such as articles and textbooks have serious limitations in how they can explain and describe the full potential of scholarly communication. Existing professional resources like the *ARL SPEC Kit* or *ACRL Toolkit* provide snapshots of current practices and tools that can be used as models for developing a position or program. They are not designed as participatory educational resources and often reflect existing, rather than potential, practice. LIS instructors, students, and practitioners need new, iterative ways of sharing and understanding the practice and potential of scholarly communication, particularly as we introduce new students and practitioners to the field.

The co-PIs for this project are especially well-positioned to conduct research that will be impactful at the national level. Their experience as LIS instructors who teach courses on legal issues and scholarly communication, combined with professional roles in scholarly communication, provide important insight and context for understanding these issues. Their roles as instructors in LIS programs and as presenters for leading scholarly communication workshops such as the ACRL Scholarly Communication Roadshow and Open Textbook Network also provide important venues for communicating and implementing the results of this research.

The data and reports generated from this project will help instructors understand the needs of LIS students and the ways that OER can help meet these needs. The outcomes of this exploratory research will include but not be limited to datasets of survey results, transcripts of focus groups, and a final open report on our findings, all of which will be made openly available

for the benefit of librarians, instructors, practitioners, and others, as described in the digital product form. Further, the key project staff will seek opportunities to speak and publish on the results of this planning grant in order to disseminate the results of the project as widely as possible. By presenting the project findings at conferences such as the annual Open Education conference, we will be able to more widely disseminate our results, as well as publicize and direct other practitioners to the open datasets, final report, and other outputs the project generates.

This research will be especially impactful because it is designed to develop transferable information about the potential of OER and open pedagogy. Openness is critical to this research because scholarly communication has a multiplicity of contexts and meanings such that every institution, instructor, and learner must tell their own story within their contexts/meanings. Many other disciplines would also benefit from such an open approach. This research will illuminate strategies for using OER to create a space in any field of study or practice with the need for voices historically excluded from presumed “authority” to influence and even own narrative, contributing inspirational stories that are grounded in experiences often absent from traditional textbooks.

This project will establish a foundation for successful ongoing collaboration between the co-PIs to develop the initial version of and framework for a dynamic OER of Scholarly Communication. The team we have assembled is well positioned to address these challenges to develop an impactful, dynamic open educational resource about scholarly communication. We have already begun to identify additional stakeholders who can contribute. The co-PIs are in preliminary talks with ACRL about hosting this resource and have been invited to lead discussion about the OER at venues such as the OpenEd17 conference.⁶ A follow-up, two-year, full project proposal is expected to be developed and submitted to the IMLS in the 2018-19 grant cycle, grounded in the outcomes and recommendations of this planning grant. By developing both the technical infrastructure for sharing and an engaged, invested community of practice, this project will seed a sustainable resource that will continue to evolve and develop in the years to come.

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⁶ <https://openedconference.org/2017/>

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Tasks (Start October 1, 2017)	October	November	December	January	February	March	April	May	June	July	August	September	Phases
Survey preparation and development													1 - Preparation & Planning
Preliminary focus group and workshop preparation													2 - Survey & Direct Engagement
Conduct survey													3 - Evaluation, Reporting, and Dissemination
Analyze survey													
Revise LIS instructor focus group questions based on survey analysis													
Conduct LIS instructor focus group													
Hold unconference/workshop													
Complete data analysis and integrate survey, focus group, and workshop findings													
Begin disseminating project findings													
Write and disseminate final report													

DIGITAL PRODUCT FORM

Introduction

The Institute of Museum and Library Services (IMLS) is committed to expanding public access to federally funded digital products (i.e., digital content, resources, assets, software, and datasets). The products you create with IMLS funding require careful stewardship to protect and enhance their value, and they should be freely and readily available for use and re-use by libraries, archives, museums, and the public. However, applying these principles to the development and management of digital products can be challenging. 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

You must provide answers to the questions in Part I. In addition, you must also complete at least one of the subsequent sections. If you intend to create or collect digital content, resources, or assets, complete Part II. If you intend to develop software, complete Part III. If you intend to create a dataset, complete Part IV.

PART I: Intellectual Property Rights and Permissions

A.1 What will be the intellectual property status of the digital products (content, resources, assets, software, or datasets) you intend to create? Who will hold the copyright(s)? How will you explain property rights and permissions to potential users (for example, by assigning a non-restrictive license such as BSD, GNU, MIT, or Creative Commons to the product)? Explain and justify your licensing selections.

All data and findings from this project will be licensed under a Creative Commons Attribution 4.0-ShareAlike International License, subject to any applicable human subject regulations. As a traditional, non-directed work, the project's final report will be owned by the authors and collaborators under NCSU REG 01.25.03 Sec. 2.9. The project's proposed journal articles are anticipated to be copyright to the authors and published in open access venues.

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.

All digital content will be shared openly on the Open Science Framework for the benefit for the community at large. We will impose no conditions on access and use beyond those in the Creative Commons Attribution-ShareAlike 4.0 International License under which we will license the project content.

Under NCSU REG 01.25.03 Sec.5.7, North Carolina State claims a perpetual non-exclusive, non-transferable, royalty-free license to use work created by employees “unless such license will impede scholarly publication or similar activities, or violate a provision of a contract between the employee and a third-party.” As such, the non-exclusive license claimed by NCSU will not limit our open licensing of the digital products. Similarly, the University of Illinois has, with approval of the faculty senate, an Open Access policy and the institutional expectation that intellectual products will be made openly available (<http://www.senate.illinois.edu/sc1512.pdf>).

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 will work closely with our Institutional Review Board administrator to ensure appropriate survey design, anonymized datasets, and informed consent for focus groups and survey participants.

The only content we will manage that may involve privacy concerns will be our survey and focus group information. We will obtain rights from our survey and focus group participants to share the data under Creative Commons Attribution-ShareAlike 4.0 International License. We will not share any personally identifiable information collected in the survey or focus groups and will anonymize all respondents. We do intend to share identifying information at the organizational/institutional level as collected by the survey with permission of respondents.

Part II: Projects Creating or Collecting Digital Content, Resources, or Assets

A. Creating or Collecting New 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 format you will use.

We will create a Survey questionnaire and collect survey data utilizing Qualtrics, an industry leader providing online survey software to which North Carolina State University Libraries has arranged a site-license. We will share the survey data as standard .txt and .csv delimited data.

Interviews will be recorded; transcripts will be prepared with names and any personal identifiers changed. Participants will have the right to have the audio recorder turned off at any time during the interview. All intermediary data files will be captured as .wav and converted to .mp4. All files will remain in the possession of the primary investigators and stored on a password protected server system run by the NCSU Office of Information Technology.

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

We anticipate using Qualtrics for our survey instrument. For the focus groups we will record using digital voice recorders and oTranscribe (<http://otranscribe.com/>). All surveys and focus groups will be conducted and managed by the PIs and affiliated staff. This project will leverage the support of the NCSU Libraries User Research Team, which has expertise in survey design and focus group facilitation, as well as in analyzing the data derived from surveys and focus groups.

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

.txt, .pdf, .csv, .wav .mp4

All audio files will comply with a sampling rate of 44.1 kHz

B. Workflow and Asset Maintenance/Preservation

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

We will follow workflow as outlined in our schedule of completion. Our timeline for meeting planned tasks will help us monitor and evaluate our progress. Workflow and procedures will be conducted using professional best practices and reviewed and managed by our Institutional Review Board, Office of Information Technology, and ICPSR as well as project leads.

B.2 Describe your plan for preserving and maintaining digital assets during and after the award period of performance. Your plan may 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).

We will manage and preserve data in ICPSR. We will archive the project and any pre-prints on NCSU's Scholarly Publications Repository (<https://www.lib.ncsu.edu/repository/scholpubs/search.php>).

C. Metadata

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

For our survey and focus group data we will provide metadata and generate documentation that conforms with Data Documentation Initiative (DDI).

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

For our survey and focus group data we will provide metadata and generate documentation that conforms with Data Documentation Initiative (DDI).

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).

We are partnering with ICPSR, which disseminates data to researchers, students, policymakers, and journalists around the world based on its Access Policy Framework (<https://www.icpsr.umich.edu/icpsrweb/content/datamanagement/preservation/policies/access-policy-framework.html>).

D. 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).

Digital content will be made accessible to the public at the end of the grant. Data will be preserved through our Scholarly Publication Repository and ICPSR. It will be made accessible to the public on ICPSR's website and via NCSU's public repository. Scholarship will be made openly available through open venues as described above.

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

NCSU Libraries Digital Projects and Initiatives page: <http://www.lib.ncsu.edu/dli/projects>,
Scholarly Publications Repository: <https://www.lib.ncsu.edu/repository/scholpubs/search.php>
NCSU Libraries GitHub Repository: <https://github.com/NCSU-Libraries>
NCSU Special Collections Research Center: <https://www.lib.ncsu.edu/scrc>
University of Illinois Institutional Repository (Ideals): <https://www.ideals.illinois.edu/>

Part III. Projects Developing Software

A. General Information

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

N/A

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

N/A

B. Technical Information

B.1 List the programming languages, platforms, 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) and URL(s) for examples of any previous software your organization has created.

N/A

C. Access and Use

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

N/A

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

N/A

C.3 Identify where you will deposit the source code for the software you intend to develop:

N/A

Name of publicly accessible source code repository:

URL:

Part IV: Projects Creating Datasets

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

Survey data will be collected in fourth quarter 2017 and first quarter 2018 using Qualtrics to store respondents' answers to a questionnaire we will administer as part of stakeholder engagement. It will be analyzed during the second quarter of our 2017 fiscal year.

Focus group data will be recorded during the first quarter of our 2018 fiscal year. Transcription and analysis will begin in the second quarter 2018 and continue through the fourth quarter of 2018.

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?

We will be developing our survey instrument and focus group questions in consultation with NCSU IRB. Based on preliminary conversations, we expect these materials to be approved the fourth quarter of our 2017 fiscal year.

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

The study will employ thorough procedures to minimize any risk and protect the participants' confidentiality and anonymity. Publications about the findings from the study will mask the identity of all participants. Interviews will be digitally recorded; transcripts will be prepared with names and any personal identifiers anonymized to protect participants. Survey data will similarly be anonymized.

Participants will have the right to have the audio recorder turned off at any time during the interview. All intermediary data files will remain in the possession of the primary investigators and stored on a password protected server system run by the Office of Information Technology.

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

Each participant will sign a consent form approved by NCSU IRB. All participant will be assigned a numeric identifier by the researchers. The identifier then will be used to reference data objects related to that participant. Both the digital copies of signed consent forms, and the name to identifier mappings will be encrypted and stored on a password protected server system of the Office of Information Technology. Only the PIs will have access to those files

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

The survey will run through Qualtrics, an industry leader providing online survey software to which North Carolina State University Libraries has arranged a site-license. We will share the survey data as standard .txt and .csv delimited data.

Individual interview data will consist of audio recordings, interview transcripts as .txt. After the transcription process is completed, the audio recordings of the interviews will be disposed. Survey data will be stored in .csv. As ICPSR members, the PIs will work with ICPSR to clean, anonymize and document the data.

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

We will associate our survey questionnaire and documentation with the survey dataset using DDI.

Our focus group data will be analyzed using a codebook generated by the project team. The codebook will be shared along with the project data.

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

Digital content will be made accessible to the public after an embargo as we create the toolkit. Data will be preserved through our Scholarly Publication Repository and ICPSR. It will be made accessible to the public on ICPSR's website and NCSU's public repository page. Scholarship will be made openly available through open venues as described above.

A.8 Identify where you will deposit the dataset(s):

**NCSU Libraries Digital Projects and Initiatives page: <http://www.lib.ncsu.edu/dli/projects>,
Scholarly Publications Repository: <https://www.lib.ncsu.edu/repository/scholpubs/search.php>
NCSU Libraries GitHub Repository: <https://github.com/NCSU-Libraries>
NCSU Special Collections Research Center: <https://www.lib.ncsu.edu/scrc>**

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

We will review the DMP during our planning phase, during the data collection process, and then prior to submitting to the ICPSR.