

**Abstract**

Reports suggest that data-driven decision making (DDDM) is critical in school effectiveness (Carlson, et al, 2011). However, preparation programs for educators are not yet consistently preparing these professionals to be data literate (Mandinach, et al, 2015; Means, et al, 2011). A case may be made that DDDM is equally critical in the effectiveness of public library systems, and that library professionals are not yet being trained to respond. With targeted training, librarians in either setting are well-positioned to provide leadership and services addressing this critical need.

Numerous efforts are underway to promote student and patron data literacy in school and public library programs. These target the work of the library professional at the individual level to promote data literacy skills. However, this planning initiative targets leadership at the staff and organizational levels by means of coaching and collaborating. It is at these levels that data literate library professionals may apply their understanding of effective data use to inform decision-making and problem-solving. Yet, the problem of competency development at multiple levels, in multiple contexts, and under changing conditions resists a single fixed training program solution. Funding for this proposal will enable a summit in which design thinking principles are applied to engage key stakeholders in the development of an innovative training program that is desirable, viable, and feasible (IDEO, 2015). Key stakeholders will include school and public library administrators, teachers, public librarians, school librarians, and pre-service librarians.

Planning initiative team members include faculty members from the University of North Texas (UNT) and Texas Woman's University (TWU): Dr. John Marino (UNT) serving as Project Director, Dr. Jennifer Moore (TWU), Dr. Sarah Evans (TWU), Dr. Barbara Schultz-Jones (UNT), Dr. Daniella Smith (UNT), and Dr. Aaron Elkins (TWU). The summit is expected to establish a network of stakeholders and engage them in training design, to promote an understanding of the need for data use services in school and public libraries, to enhance the training of library professionals through the identification of data literacy competencies at three levels, and to develop a pilot training program. Expected outcomes include an analysis of stakeholders' stated needs, a list of competencies at three levels, a curriculum designed to develop competencies, and a plan for implementation of the pilot training program. Success will be measured by planning team observations, participant evaluations, documented work products, and implementation of the pilot training program at both institutions in the spring of 2019. The planning initiative is expected to begin in October 2018 and conclude by August 2019.

This planning initiative addresses the goals of the Laura Bush 21st Century Librarian Program (LB21) grant category through the development of data literacy competency, collaboration, and leadership skills in the next generation of library professionals to meet the demand for DDDM in public libraries and K-12 schools. It targets the goals of the Community Anchors project category through the development of a training program in data literacy leadership designed to address community needs for data use services, and the increase in capacity of library professionals to apply data analytics to the needs of individuals, library staff, and the organization to maximize effectiveness and potential.

Funding for this planning initiative will enable the establishment of a network of stakeholders serving as co-designers in the development of competencies and curriculum for a pilot training program in data literacy leadership for pre-service library professionals. This training program, implemented at both institutions, is expected to have a profound impact on practice as graduates will be prepared to provide essential services in data use to their communities, and will provide a model for national implementation.

For this planning initiative, we request \$45,851 to support the work of faculty members from UNT and TWU, the participation of key stakeholders and expert consultants, and costs associated with the summit.

## **Organizational Profile**

The University of North Texas (UNT) is a four-year public Doctoral University with a Carnegie Classification of Highest Research Activity (R1). The institution was founded in 1890 as a normal and teacher-training institute; its name changed from North Texas State University in 1988. UNT is in Denton, Texas, a town of over 131,000 in the Dallas/Fort Worth area of over 6.8 million. The University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award baccalaureate, master's, and doctoral degrees. UNT is the 5<sup>th</sup>-largest university in Texas, and among the 30 largest in the United States, with a combined enrollment of 38,081.

The mission statement of UNT: “UNT is a major public research university deeply committed to advancing education excellence and preparing students to become thoughtful, engaged citizens of the world. This is accomplished through a broad and balanced array of programs where well-prepared students and dedicated scholars and artists collaborate with our local and global communities in the creation, integration, application, and dissemination of knowledge. In this way, UNT creates an enriched and sustainable future for our students, state, nation and world.” The responsible party for the mission statement is the Office of the President; it was approved on January 1, 1983, and last revised on July 31, 2015. It is located in Chapter 3 Governance of the Policies of the University of North Texas.

The UNT College of Information (CI) is a member of the iSchools organization and is comprised of three departments: Department of Information Science, Department of Linguistics, and Department of Learning Technologies. Faculty and graduate students are highly productive in a wide variety of research efforts related to human information seeking, learning, and use behaviors; human-computer interactions; development, delivery, and evaluation of information and education systems and services; information and education policies and ethics in public and private sectors; computational linguistics, and the study of endangered languages. The CI has multiple research centers and labs and a record of success in obtaining research funding from sources such as the Institute of Museum and Library Services, the National Science Foundation, the National Aeronautics and Space Administration, the Texas Education Agency, and others. The Department of Information Science (DIS) faculty is currently comprised of 21 full-time faculty, including 17 tenure-system faculty. As of the Spring 2018 semester, DIS had 948 students enrolled in its graduate and undergraduate programs. DIS master's degree programs in Information Science and Library Science are accredited by the American Library Association and ranked 17th nationwide by U.S. News & World Report. A new master's degree program in Data Science has been added in 2018. The DIS Interdisciplinary Ph.D. Program in Information Science offers seven concentrations created and implemented jointly with other academic units, in addition to a general program of study. DIS faculty is diverse, and through residential and distance learning programs proudly serves a diverse student population from across the state, nation, and world.

## **PREPARING LIBRARIANS FOR DATA LITERACY LEADERSHIP (LB21-FY18-2)**

### **Statement of Broad Need**

The University of North Texas College of Information (UNT) and Texas Woman's University School of Library and Information Studies (TWU) request funding from the Institute of Museum and Library Services to plan the design of a pre-service library professional preparation program that develops competencies in data literacy leadership. Reports suggest that data-driven decision making (DDDM) is critical in school effectiveness (Carlson, et al, 2011); a similar case may be made that DDDM is critical in the effectiveness of public library systems. Yet, preparation programs for educators and librarians are not yet consistently preparing these professionals to be data literate (Mandinach, et al, 2015; Means, et al, 2011). With targeted training, librarians in either setting are well-positioned to provide leadership and services addressing this critical need.

To meet standards for accreditation by the American Library Association (ALA), library professional training programs must provide curriculum that "is concerned with information resources and the services and technologies to facilitate their management and use" so that professionals "assume a leadership role in providing services and collections appropriate for the communities that are served" (Committee on Accreditation of the American Library Association, 2015, p. 5). However, with no specific mention of competencies related to data as information resources, these may or may not be included in professional preparation programs. This planning initiative explores the potential for the school or public librarian to provide data literacy leadership through the systematic development of competencies in the master's-level pre-service professional preparation program.

Data literacy has been described by Mandinach & Gummer (2013) as "the ability to understand and use data effectively to inform decisions" (p. 30). It is important to note that this means more than interpreting standardized test scores to inform instruction; data literacy should produce more effective decision-making, problem-solving, and discernment of misinformation and disinformation (Wineburg, et al, 2016; Lazer, et al, 2014). The library professional who is data literate has developed a range of competencies: posing questions that are aligned with purpose and data, locating relevant and meaningful data, data comprehension, data interpretation, the use of data in professional functions, the application of data literacy skills to accountability activities such as tracking organizational performance, instruction related activities such as informing instructional practice, and other activities such as examining organizational climate and evaluating staff performance (Means, et al, 2009). It is critical to recognize that these competencies must be applied at three levels: individual, staff, and organization. More focus on the **coaching and collaborating** role of the librarian in DDDM is needed; this is why an emphasis is made on leadership in this proposal.

In the process of developing this planning grant proposal, the planning initiative team recognized a parallel structure within school and public libraries. In the case of schools, at the individual level the data literate school librarian will collaborate with teaching partners to design learning activities that develop student data literacy skills; at the staff level the data literate school librarian works with staff colleagues as a data teams coach in interpreting and using student assessment and other data to differentiate instruction; and at the school level the data literate school librarian will work with administration to interpret and apply building data to develop strategies for meeting goals and overall school improvement. The data literate public librarian must also apply these competencies at three levels: consulting with individual patrons through the reference interview or programming to understand and apply data in their own lives, providing leadership with staff colleagues in using data in the design

and evaluation of programs and services, and working with administration to use data in conducting community analyses and developing strategies for organizational improvement.

Research suggests that the components crucial for effective data use within an organization include a clearly-articulated vision for the use of data within the organization, the establishment of a culture that uses data, the integration and availability of technology that supports the use of data, and the creation of data teams and coaches (Mandinach & Gummer, 2016). Library professionals with competencies developed in data literacy are prepared to provide the leadership necessary to contribute to a shared vision of data use within the organization, to set expectations and establish practices of data use that become part of the organizational culture, facilitating professional development with colleagues in learning new technologies and integrating these into data use practices, and collaborating with staff members to form data teams and coaching teams in the effective use of data to inform decision-making.

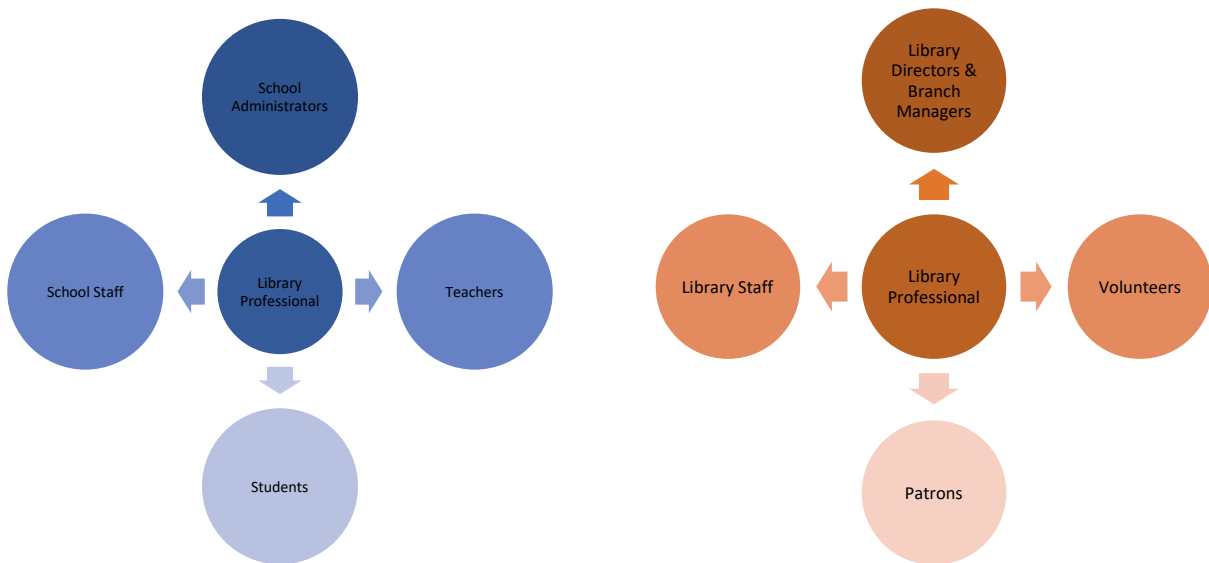
Today's librarian is a community partner, program developer, instructor, reading advocate, information service provider, and more. As school and public library administrators are tasked with an increasing amount of data with the potential for organizational improvement, the support necessary to ensure that data collection leads to actionable goals is often unavailable. Anticipating the need for the library professional to provide leadership in data analytics, then Dean of the Information School at the University of Washington, Mike Eisenberg, proposed a two-librarian partnership model with one serving in the role of the building's Chief Information Officer specializing in data service leadership, and another serving as the building's programming partner and reading advocate (Seattle Times, 2004). However, the management of a data-driven framework is a new dimension for the role of the library professional and not yet guided by evidence-based principles for effective implementation.

Some library professionals have prepared themselves for data literacy leadership. Teresa Lansford describes the impact of this type of leadership in her role as a school librarian: "As a leader on our data team, I provide administration and staff with the materials they need to make informed decisions on school-wide practice" (2017, p. 79). She documents her efforts to embrace the opportunity to collect, analyze, and apply insights from the student data available in her school, including the analysis of circulation data to target instructional interventions and standardized testing data to target skill development. In her example, the school librarian initiates collaborative partnerships, serves as a consultant on DDDM, offers clear instructions on applying the principles of DDDM, and through lesson design and co-teaching highlights the link between student data and instructional practice, all described by Dunlap & Piro (2016) as "pathways to data literacy." This example also highlights another key to realizing the full potential of data literacy leadership: a positive self-perception of one's own data literacy (Piro, et al, 2014).

Numerous efforts are underway to address the need for DDDM and promote data literacy in school and public library programs. A recent IMLS-funded project, Supporting Librarians in Adding Data Literacy Skills to Information Literacy Instruction, explored the development of data literacy competencies of high school librarians through in-service professional development to support instruction in student comprehension skills (Fontichiaro & Oehrli, 2015). Another recent IMLS-funded project, Exploring Data Worlds at the Public Library, explored strategies for promoting youth data literacy through public library programming, and for preparing youth librarians for this instructional role (Bowler & Acker, 2018). The proposed planning initiative supports a project that complements both efforts through pre-service preparation and targets not only leadership in the development of data literacy skills in students and patrons, but also in coaching and collaborating with colleagues in data use for differentiated instruction and the development and evaluation of programs and services, as well as working with

administration in using data for organizational improvement, in either setting. At this time, the proposed project focuses on the pre-service preparation of library professionals serving in schools and public libraries, where the need for data use services are similar; preparation for those serving in academic and other settings has been the focus of other IMLS grant-funded studies (Carlson & Johnston, 2015).

The challenge of developing training for library professionals in data literacy leadership as a component of the pre-service preparation program is complex. The need for data literacy leadership must be addressed at three levels of engagement in two settings (see Figure 1). At the individual student or patron level, the data literate librarian focuses on vertical-downward engagement characterized by direct instruction in data literacy skill development or consultation through the reference interview or program/service delivery (examples include a lesson on analysis of survey data or a program on career selection using the Occupational Outlook Handbook by the Bureau of Labor Statistics). At the staff level, the data literate librarian focuses on horizontal engagement characterized by collaboration with colleagues (examples here include coaching data teams to use standardized assessment data to design differentiated instruction or using community statistics to plan programs and make collection development decisions). At the organizational level, the data literate librarian focuses on vertical-upward engagement characterized by supporting administration in the use of data for goal-setting and organizational improvement (examples include examining behavioral data to plan recess and extracurricular activities or using data to meet accountability to library boards and government councils). Added to the complexity of this challenge is the rapidly-changing nature of data resources and information technologies designed to manage them.



**Figure 1. Three levels of engagement in two settings.**

A team of graduate faculty from UNT and TWU met to discuss the development of a pre-service training program in data literacy leadership and soon recognized that simply developing a data literacy curriculum for online delivery in isolation would not likely maximize effective results. The problem of competency development at multiple levels, in multiple contexts, and under changing conditions resists a single fixed training program. This resembles a wicked problem, described by Rittel & Webber (1973) as complex, subject to changing conditions, and resistant to any single fixed solution. In proposing a design epistemology for librarianship, Clarke (2018) concludes, “Design is often used to tackle wicked problems that have failed to be solved via more traditional research approaches” (p. 44). This team of

graduate faculty became the planning initiative team and resolved to apply design principles to the development of the training program.

Design Thinking for Libraries (IDEO, 2015) is a method based upon design principles and developed for use in tackling the complex challenges facing libraries. The planning initiative team organized a simulation of this method in the spring of 2018 to evaluate its suitability and feasibility in addressing the challenge of data literacy leadership training. Four members of the team participated in a day-long simulation and produced a prototype of a training program; the member serving as evaluator recognized the creativity of the training prototype and components designed to promote appeal and engagement but found fault with its effectiveness in developing necessary competencies. The team found that the Design Thinking for Libraries method highlighted nuances of the challenge that were not apparent and promoted innovation; moreover, the team discovered that the development of a training program in data literacy leadership was a distinctly different challenge than the development of data use services in the library. This crucial distinction clarified the focus of the Preparing Librarians for Data Literacy Leadership Summit toward the content of the training program. The team concluded that the method was indeed suitable and feasible for the design of an effective pre-service training program in data literacy leadership for library professionals. A Design Day is planned for August of 2018 to focus on the format of the training program. Moreover, this method will be employed during the summit in ways to be determined during the Pre-Summit Planning Meeting.

This planning initiative addresses the goals of the Laura Bush 21st Century Librarian Program (LB21) grant category through the development of data literacy competency, collaboration, and leadership skills in the next generation of library professionals to meet the demand for data-driven decision-making in public libraries and K-12 schools. It targets the goals of the Community Anchors project category through the development of a training program in data literacy leadership designed to address community needs for data use services. This planning initiative targets the increase in capacity of library professionals to apply data analytics to the needs of individuals, library staff, and the organization to maximize effectiveness and potential. Design thinking is employed in the plan to engage key stakeholders in the development of an innovative training program that is desirable, viable, and feasible (IDEO, 2015).

Funding for this planning initiative will enable the establishment of a network of stakeholders that will serve as co-designers in the development of curriculum and pedagogy that will serve as a pilot training program in data literacy leadership for pre-service library professionals. The implementation of a pre-service professional preparation pilot program to develop data literacy competencies in either school or public library settings in a systematic way at both institutions is expected to have a profound impact on practice, as graduates will be prepared to provide essential services in data use to their communities. Such a pilot program will enable investigations of pedagogic and practical efficacy and provide a model for national implementation.

### **Project Design**

The funds requested for this planning initiative will enable the involvement of stakeholders in the development of a pilot training program. This section describes the design of this planning initiative, including performance goals, expected outcomes, and measures of success; the sequence of planned activities; and personnel and resources assigned to each planned activity.

#### *Performance Goals*

Performance goals, expected outcomes, and measures of success are in alignment with the Laura Bush 21<sup>st</sup> Century Librarian Program and listed in Table 1.

<b>Performance Goals</b>	<b>Expected Outcomes</b>	<b>Measures of Success</b>
Create a summit plan that addresses goals and that stakeholders find engaging and worthwhile.	Summit plan to include content, format, structure, and evaluation.	<ul style="list-style-type: none"> <li>● Summit plan is complete.</li> <li>● Observation of summit execution matches plan.</li> <li>● Evaluations by summit participants positive on measures of engagement and impact.</li> </ul>
Establish a network of stakeholders and engage them in training design.	<ol style="list-style-type: none"> <li>1. Network of stakeholders committed to goals.</li> <li>2. Design process enhanced by stakeholder participation.</li> </ol>	<ul style="list-style-type: none"> <li>● Attendance of invited participants at summit.</li> <li>● Range of stakeholders represented on network list.</li> <li>● Observations of participants actively engaged in design processes.</li> </ul>
Understand the need for data use services in school and public libraries.	<ol style="list-style-type: none"> <li>1. Analysis of stakeholders' stated needs.</li> <li>2. Broadened stakeholder vision of what's possible in data use services.</li> </ol>	<ul style="list-style-type: none"> <li>● Stakeholder descriptions of stated needs recorded as data and analyzed qualitatively.</li> <li>● Evaluations by summit participants indicate a broadened vision.</li> </ul>
Enhance the training of library professionals through the identification of data literacy competencies at three levels of engagement: individual, staff, organization.	<ol style="list-style-type: none"> <li>1. List of competencies at three levels.</li> <li>2. Recognition by stakeholders of the expertise necessary for data literacy leadership.</li> </ol>	<ul style="list-style-type: none"> <li>● List of competencies identified by summit participants is comprehensive as measured by related reports and addresses 3 levels of engagement.</li> <li>● Evaluations by summit participants indicate recognition of expertise.</li> </ul>
Enhance the training of library professionals through the design of curriculum to develop competencies and leadership capabilities.	<ol style="list-style-type: none"> <li>1. Curriculum designed to develop competencies.</li> <li>2. Recognition by stakeholders that understanding of data and confidence in data leadership are distinct.</li> </ol>	<ul style="list-style-type: none"> <li>● Draft curriculum is complete: includes a structure for organizing competencies into content areas, goals/outcomes for learning identified for each content area.</li> <li>● Evaluations by summit participants indicate recognition of the relationship of understanding and confidence.</li> </ul>
Develop a pilot training program.	Plan for implementation of the pilot training program.	<ul style="list-style-type: none"> <li>● Pilot training program is complete and approved for enrollment in spring 2019.</li> <li>● Plan for program development for pre-service librarians complete.</li> </ul>

**Table 1. Planning Initiative Performance Goals, Expected Outcomes, and Measure of Success.**

Success of this planning initiative will be defined by fulfillment of these performance goals as measured by the metrics and products associated with each of the expected outcomes. It is anticipated that the

success of this planning initiative will inform the design of a comprehensive and systematic professional preparation program in data literacy leadership for library professionals with both pre-service and in-service options, and multiple setting specializations.

The planning initiative team has identified two risks to the project: 1) the absence of invited stakeholders to attend the summit and 2) the stakeholder group unable to complete performance goals during the summit (due to lack of consensus, time, vision, etc.) Participants in the summit will be invited to represent a critical stakeholder perspective; the absence of any one of them jeopardizes the complete representation of all stakeholder perspectives. To address this first risk, a list of substitutes expressing an interest in being “on-call” will be generated by the planning initiative team at the Pre-Summit Planning Meeting. The second risk threatens the implementation of the pilot training program as scheduled. To address this second risk, two members of the planning initiative team will serve as documentarians at the summit, recording all summit activities, so that this documentation may be synthesized into a list of competencies, draft curriculum, implementation plan, and any other expected outcome identified by the team as critical for the implementation of the pilot in the spring semester of 2019.

### *Participants*

Essentially, the success of this planning initiative is dependent on the participation of the identified stakeholders. The members of the planning initiative team are all faculty conducting research in LIS, and teaching courses at the graduate level. Three are faculty members at UNT, and three at TWU:

- Barbara Schultz-Jones, Ph.D., Associate Professor, UNT
- Jennifer Moore, Ph.D., Associate Professor, TWU
- Daniella Smith, Ph.D., Associate Professor, UNT
- Aaron Elkins, Ph.D., Assistant Professor, TWU
- Sarah Evans, Ph.D., Assistant Professor, TWU
- John Marino, Ph.D., Assistant Professor, UNT

This partnership was formed to leverage the expertise of the LIS programs at both institutions and to tap the potential of transforming the pre-service preparation of LIS students across the State of Texas and beyond.

A key design principle is the inclusion of stakeholders in the design process in order to develop empathy and accurately define the design challenge. School administrators and public library directors need to describe their own current practices in data use for informing program and service development and organizational improvement; they then need to identify their needs for training and support in implementing more effective practices. A survey on current practice and future needs has been prepared by the planning initiative team and will be administered in June of 2018 to more than 1,000 public library directors and branch managers and more than 5,000 school administrators selected randomly across the State of Texas (see Supporting Document 2 for the complete survey). Responses to this survey will be analyzed and compiled into a report to be accessed by participants in the Preparing Librarians for Data Literacy Leadership planning meeting and summit. Moreover, four representatives (two of each) will be invited through convenience sampling to attend the summit. Teachers and public librarians need to articulate expectations for their practices in data use and assessments of their own preparedness; four representatives (two of each) will also be invited through convenience sampling to attend the summit. Four representatives of students enrolled in the master’s degree in library and information science programs at either UNT or TWU (2 from each, one each pursuing the school library certification and the public library tracks) will be invited through convenience sampling to attend the summit.



Two consultants have agreed to participate, representing two distinguished and necessary perspectives:

- Teresa Lansford, a school librarian currently in practice and providing data literacy leadership in her district in Norman, OK; she will provide a realistic vision of this type of leadership, and its impact on DDDM in K-12 schools (Lansford, 2017).
- Mike Eisenberg, Ph.D., Professor and Dean Emeritus of the Information School at the University of Washington, provides many years of experience as a library program advocate and scholar (Eisenberg & Berkowitz, 1990; Eisenberg & Miller, 2002; Eisenberg, et al, 2016); he also provides a transformative vision of data literacy leadership (see Letter of Intent, Supporting Document 3).

In all, twenty stakeholders are expected to participate in the one-day Preparing Librarians for Data Literacy Leadership Summit.

### *Sequence of Planned Activities*

There are three events in this planning initiative, with related tasks to support these events.

- I. **Pre-Summit Planning Meeting (Monday, October 8, 2018).** This meeting is scheduled to organize the summit and to procure a facility and food services. The efficiency of this meeting is supported by the extensive advance work conducted by the planning initiative team including the identification of invited stakeholders, the organization of the administrator survey report for use by participants at the summit, and the procurement of facilities and food. The agenda for the day will be developed at this meeting, to include **structure** (summit itinerary, goals, outcomes, and evaluation), **content** (stakeholder discussion of current practice in data use and service needs, idealized vision of data use practice and service provision, research related to factors that support effective data use, review of three levels of service engagement, generation of related competencies, research related to understanding and confidence as they relate to leadership, curriculum development, pedagogical strategies for competency development, applicable theories of learning, and pilot implementation plan), and **format** (presentation, design activities including discussion, group work, prototyping). Moreover, participants that have not yet been identified through convenience sampling or personal contacts to fill the planned stakeholder roles will be identified and contacted, and a list of substitutes will be generated.
  - a. Personnel: Members of the planning initiative team (6 LIS faculty from UNT and TWU--the “planning initiative team”) and the advocate consultant (1).
  - b. Resources Allocated: Funds budgeted for room reservation and food service, office supplies to be used at the summit, and compensation for consultant and members of the planning initiative team (Principal Investigator/Project Director, 3 Co-PIs, and 2 academic collaborators).
  - c. Time: This meeting is scheduled to last 3 hours.
- II. **Preparing Librarians for Data Literacy Leadership Summit (Friday, October 26, 2018).** The centerpiece of this planning initiative is a one-day summit bringing together a range of stakeholder perspectives: from K-12 schools (school principals, teachers, and pre-service school librarians), public libraries (library directors, branch librarians, and pre-service public librarians), higher education (the planning initiative team), a school librarian in practice as a data literacy leader and consultant, and an advocate/visionary consultant for library programs. The agenda developed during the Pre-Summit Planning Meeting will be put into play. Several work products completed at the summit will serve as measure of success, including a list of stakeholders participating in the summit, a list of needs for data use services as stated by stakeholders, a set of

competencies related to data literacy leadership, and a draft curriculum for pilot implementation (see Part IV below for a description of one iteration of the plan).

- a. Personnel: Members of the planning initiative team (6), consultants (2), stakeholder collaborators (12).
- b. Resources Allocated: Compensation for both consultants, stakeholder collaborators, and the planning initiative team.
- c. Time: This summit is scheduled to last 6 hours (inclusive of a working lunch).

- III. **Post-Summit Activities (November 16 and December 7, 2018).** The planning initiative team will engage in post-summit activities including a meeting to analyze stakeholder needs data, finalize the curriculum, and review alignment with the *National School Library Standards for Learners, School Librarians, and School Libraries* (American Association of School Librarians, 2018) and the *Professional Competencies for Reference and User Services Librarians* (Reference and User Services Association, 2018). At this meeting, the team will also organize the pilot training program implementation in the spring semester of 2019. A second meeting is planned to develop a report based on products of the summit, determine venues for dissemination of the report and related information (participating stakeholders and related communities, ALISE, AASL/ALA, ASCD, IMLS), and design the next stage of the research project. This report will be submitted to the American Association of School Librarians (AASL) for use during the current review process of new standards for the preparation of school librarians.
- a. Personnel: Members of the planning initiative team.
  - b. Resources Allocated: None.
  - c. Time: 2 sessions of 3 hours each.

- IV. **Pilot Program Implementation (Spring semester 2019).** The pilot program will be implemented at both UNT and TWU during the spring semester of 2019, recruiting participants from the largest pool of pre-service library professionals in the state. Although the design process encourages innovation and a series of iterations of the prototype, the planning initiative team expects that the pilot program will include the following features: 1) an online format to accommodate our distance learning students, 2) a series of webcasts introducing key concepts developed by the planning initiative team, 3) real-world information problem-solving activities set within library contexts across the state and organized by modules, 4) immediate and ongoing feedback from faculty, and 5) a 6-part/6-week mini-course structure. Of course, the final form of the pilot training program will be shaped during the design process at the summit. But it is expected that students enrolling in this program will demonstrate mastery of related competencies, and confidence in providing leadership. At the conclusion of the courses, the planning initiative team will examine a variety of data points to determine effectiveness, thus applying their own data literacy skills to the data literacy course. Evaluation of the pilot program and extension of the research project are planned for the summer of 2019.
- a. Personnel: Members of the planning initiative team.
  - b. Resources Allocated: TBD (post-planning initiative).
  - c. Time: TBD (post-planning initiative).

### **Diversity Plan**

While schools and public libraries across the country are making attempts to implement DDDM frameworks to guide programming and organizational improvement, the absence of on-site data literacy leaders impacts rural more than urban communities, and less-affluent more than affluent communities—these communities face greater challenges in accessing external resources to support students and community members. The planning initiative team, as faculty members in master’s degree programs in

library and information science at UNT and TWU, have compiled anecdotal data from students enrolled in online courses. These students describe rural library settings with concerns over broadband internet access, library automation, access to online resources, and more. Anecdotal evidence also indicates that many library collections and services are not responsive to the needs of the significant Latinx community in the State of Texas; competent and confident leaders in data analytics data analysis are needed to make changes in collection development and resource allocation practices across the state. A plan to prepare the library professional for this leadership addresses these diversity challenges.

There are few examples of pre-service preparation programs training library professionals to assume this data literacy leadership. UNT and TWU are the largest school library certification programs in the State of Texas and are both located in Denton, TX; together, they likely prepare more school librarians for service than any other single institution in the United States. Moreover, each institution prepares a comparable number of library professionals to enter service in public library settings. As pioneers of distance learning degree options, students enrolled in the master's degree in library and information science are in diverse geographic regions of the state and beyond, in urban and rural areas, and in a range of culturally- and economically-diverse communities. This provides a unique opportunity for data literate library professionals to make a broad impact. The implementation of a preparation program to develop data literacy competencies in either school or public library settings and in comprehensive and systematic way at both institutions will have a profound impact on effective DDDM in these settings across the State of Texas and beyond.

### **Broad Impact**

This planning initiative addresses a critical need in schools and communities for leadership in data-driven decision-making by preparing librarians to provide data use services. Anticipated outcomes include the establishment of a network of stakeholders who will participate at various stages in the design of a model for the systematic preparation of public and school librarians to fill this role, the development of effective strategies in data literacy leadership training, and the design of a curricular model with the potential to fill an immediate and critical need in K-12 schools across the state, and to serve as an example for school librarian preparation programs across the country.

The planning initiative team expects this effort to have a broad and profound impact on practice in school and public libraries in a number of ways. By addressing the need for improved data-driven decision-making in K-12 schools (Mandinach, 2012; Means et al, 2009) through training enhancement of the school librarian workforce, it is anticipated that a vision of the school librarian as a data literacy leader will be clarified and shared by a broader range of stakeholders; this has been the experience of the school librarian consultant invited to participate in the summit (Lansford, 2017). At this point, the parallel needs for improved DDDM in public libraries and data use services expressed by communities have been documented only anecdotally; however, it is also anticipated that a vision of the public librarian as a data literacy leader will be clarified and broadened. With a shared vision of leadership from the librarian, the expectation of competency development in training programs for library professionals will drive the need for effective programs. The partnership of UNT and TWU is well-positioned to provide insight and guidance for program development to institutions across the country.

The enhancement of training for library professionals to include data literacy leadership at two partner institutions serving the entire State of Texas and beyond offers opportunities for research and pedagogy. The impact and effectiveness of this training may be measured for program evaluation and to share with the LIS education community. Based on anecdotal evidence, the planning initiative team believes that the vision for data literacy leadership in school and public libraries has not yet been clarified or realized

by any stakeholder—school administrator, library director, teacher, library board member, or even librarians themselves. It is anticipated that clarification of this vision will be embraced by all stakeholders but librarians, who may perceive this leadership as a burdensome and unachievable goal. The planning initiative team addresses this likely concern through a participatory design format for the summit to include the concerns of pre- and in-service librarians, but also through the Design Day event (to precede the planning initiative) that will include pre-service librarians in the design of training that will be effective and engaging.

The focus on the development of the training format at the Design Day event could include ideas/strategies for data services and should yield an effective and engaging training format to be incorporated with the work of the summit. The focus of the August Design Day Workshop is on the "how" of data literacy leadership and includes pre-service library program students as the target user group. The summit will bring together administrators, directors, teachers and public librarians as the key stakeholders with the focus on the "what" of data literacy leadership: competencies, curriculum and services. The planning initiative team anticipates that the implementation and documentation of a design approach to the complex challenge of training program development in data literacy leadership will inform the adoption of design as a method and epistemology in future challenges faced by those in the library community (Clarke, 2018). The design method will also be employed in the development of an in-service model for a training program that could be made available as a certificate program to library professionals in practice.

As a planning initiative, this effort leads to a larger research project investigating the enhancement of library workforce training in data literacy leadership. In the next stage of this project, it will be necessary to evaluate the effectiveness of the pilot training program implemented at UNT and TWU through the analysis of competency development and leadership confidence. These evaluations will inform the next iteration of the training program to be implemented formally as a program requirement in the master's degree program in library and information science at both institutions. Ongoing evaluations of the program content and pedagogy will continue to inform iterations of the program in accordance with design principles. Moreover, longitudinal studies are necessary to measure the impact of this training program on school and public library communities over time. The research team anticipates disseminating progress reports on the project in traditional venues such as peer-reviewed journals and conferences, but also through social media and non-traditional high-impact venues.

It is anticipated that the success of this planning initiative will inform the design of a comprehensive and systematic professional preparation program in data literacy leadership for library professionals with both pre-service and in-service options, and multiple setting specializations. The research projects to follow will determine the measures of success for these new library workforce skills and the transformations in practice these ignite.

**\*All references cited in Supporting Document 1.**

**Schedule of Completion**

Activities related to this planning grant are expected to commence on October 1, 2018 and conclude on September 30, 2019.

<b>Activity</b>	<b>October</b>	<b>November</b>	<b>December</b>	<b>January</b>	<b>February</b>	<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>August</b>	<b>September</b>
Pre-Summit Planning Meeting												
Summit: Preparing Librarians for Data Literacy Leadership												
Post-Summit Meeting 1												
Post-Summit Meeting 2												
Pilot Program Implementation												
Pilot Program Evaluation												
Dissemination of Report and Plan												

# 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

Please check here if you have reviewed Parts I, II, III, and IV below and you have determined that your proposal does NOT involve the creation of digital products (i.e., digital content, resources, assets, software, or datasets). You must still submit this Digital Product Form with your proposal even if you check this box, because this Digital Product Form is a Required Document.

If you ARE creating digital products, 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.

The work products of the Preparing Librarians for Data Literacy Leadership Summit include curriculum that is expected to be delivered online to participants in the pilot training program implemented in the spring semester 2019. The University of North Texas and Texas Woman's University will jointly hold any applicable copyright for the curriculum. It is the intent of the planning initiative team to make freely accessible to other related work products (reports, list of competencies, etc.) A Creative Commons Attribution-Non-Commercial-No-Derivatives 4.0 International license may be appropriate for these materials and will be displayed on hosting web pages.

**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.

UNT and TWU will assert their standard rights over any course developed by faculty within the institutions. Access to the course curriculum will be restricted to those enrolled at either institution, but related information and materials will be freely accessible. Terms of access and conditions will be communicated to users of any work product.

**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.

Each student participating in the pilot training program will have their privacy rights protected per university policy. Freely available products will not involve privacy concerns.

## **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.

The digital content created according to the planning grant include a curriculum designed to develop competencies in data literacy and to develop confidence in providing data literacy leadership. This curriculum will be delivered in an online format during the pilot training program.

**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.

This content will be delivered on a learning management system administered by each institution.

**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).

Not applicable for this project.

### **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).

Students participating in the pilot training program will be asked to complete anonymous evaluations as part of the quality control plan.

**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).

The pilot training program curriculum will be hosted on a learning management system, e.g. Blackboard at UNT.

### **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).

Not applicable for this project.

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

Not applicable for this project.

**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).

Not applicable for this project.

## **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).

The digital content in the form of online curriculum will be made available via learning management systems with access to those who are enrolled in the course at no additional cost to the student beyond what is obligated to the university for matriculation. Related content such as reports and lists will be made freely available to the public via university-hosted websites and social media such as Twitter and Facebook.

**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.

Not applicable for this project.

## **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.

Not applicable for this project.

**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.

Not applicable for this project.

### **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.

Not applicable for this project.

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

Not applicable for this project.

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

Not applicable for this project.

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

Not applicable for this project.

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



Not applicable for this project.

### **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.

Not applicable for this project.

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

Not applicable for this project.

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

develop: Name of publicly accessible source code repository:

URL:

Not applicable for this project.

### **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.

Not applicable for this project.

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

Not applicable for this project.

**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).

Not applicable for this project.

**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.

Not applicable for this project.

**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).

Not applicable for this project.

**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?

Not applicable for this project.

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

Not applicable for this project.

**A.8** Identify where you will deposit the

dataset(s): Name of repository:

URL:

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

Not applicable for this project.