

Students Data Literacy Needs in Community Colleges: Perceptions of Librarians, Students and Faculty

Project Justification

This project supports the **Laura Bush 21st Century Librarian program** goals and objectives, specifically Objective 3.2: Create and/or refine training programs that build library and archival workforce skills and expertise in contributing to the well-being of communities, and Objective 3.4: Support training of the library and archival workforce to advance digital inclusion for the benefit of community members. This 18-month **Planning grant** project (\$96,428), proposed by The University of North Texas (UNT) Department of Information Science, explores the need for data literacy in community colleges (CC). The project aims to explore the current data literacy perspectives of CC librarians, faculty, and students; identify the data literacy competencies needed for CC students; and develop a data literacy instruction model for CC libraries.

Statement of Need: With the advent of big data, data literacy has become an essential part of education today as the range of skills and knowledge needed to handle data is now critical in our personal and professional lives. Higher education¹ is not exempt from this necessity as data literacy has been recognized as an important learning outcome. Students are constantly bombarded with data in every aspect of their lives, yet many are not prepared to understand, produce, use, manage, share, and work with data. Responding to increased data literacy demands, data librarianship, which is connected with information science, e-science, and data science, has emerged, and many academic libraries have offered research data services that are needed to help researchers effectively execute the data stewardship workflow. Such services, however, primarily address the needs of faculty and graduate students and mainly involve data management support. While enhancing the data literacy competency of students can improve their academic performance and provide a sound basis for their professional development as it adapts to the big data age, few studies have investigated the current status of data literacy education for undergraduate students. In particular, there is a dearth of research into two-year programs at community colleges. Students here are either preparing to move on to a four-year institution or pursuing vocational or technical training to enter the workforce. In either case, these students will also need data literacy skills. Even in careers such as horticulture or automotive technology, increasingly large sets of relevant data are available, and employees are expected to know how to make use of it. CC libraries, which are recognized for their importance in the student learning process and where information literacy education has had a disciplinary home, also face challenges in incorporating data literacy into their existing literacy programs. Recent literature recognizes the need for data literacy instructions in undergraduate institutions and explores ways to establish campus-specific data literacy competencies across the curriculum (e.g., Burress, Mann, & Neville, 2020). However, how to address students' data literacy needs, foster their data literacy, and situate data literacy within a broader information literacy context are still confronting and challenging questions.

Broad Impact: The 1,044 community colleges in the United States serve 11.8 million students in both credit and non-credit courses (American Association of Community Colleges, 2021). This number represents 41% of all undergraduate students in the United States. The importance of the CC has grown as access to higher education serves as a pathway for both individual prosperity and community stability. CCs, however, have been the subject of little research over time, and CC libraries have been researched even less, despite being partners and leaders in ensuring success at their institutions by providing a variety of important spaces, resources, and services for their students.

We are in a critical stage to initiate and expand workforce development programs that will address CC students' data literacy needs and challenges. To continue evolving their support of these needs and challenges, CC libraries must think about how to adapt their spaces, resources, and services. In this context, this project's outcome will assist CC libraries/librarians in assessing their current capacity and develop a roadmap to incorporate data literacy into their literacy programs.

Project Work Plan

The project team will use a collaborative research approach, mixed methods, and multi-institutional samples drawn from U.S. community college campuses. This project builds on and extends the project team's work on data literacy (Kim, Hong, & Evans, 2021). Prior to beginning of the project, investigators will complete a comparative analysis of current data literacy competency frameworks that inform data literacy education and assessment tools. This analysis will be conducted to identify a set of common core competencies that apply to our target community. The identified competency areas and examples will be utilized as an inquiry framework for developing subsequent focus group interviews and survey questions. The project will include the following phases.

- 1) Focus Groups with CC Librarians: Focus groups with librarians are intended to elicit librarians' views on undergraduate students' data literacy needs and the library's role in addressing such needs. Two focus groups – one with library directors and the other with librarians – will be interviewed and participants will be recruited nationally through referral from our

¹ The 2018 National Academies' consensus study report identified ten components of "data acumen," including mathematical foundations, computational foundations, data management and curation, data description and visualization, etc. The report also asserted a need for all undergraduates to develop the appropriate depth of understanding in each of those components (National Academies of Science, Engineering, and Medicine, 2018).

advisory panel. We expect to have six to seven participants in each group. We will also strive to include participants from a range of college sizes and locations. This data will be utilized in our concurrent item generation and subsequent item refinement stages, ultimately creating a list of survey items designed to gather input from a broad community of CC librarians.

- 2) Survey of CC Librarians: The survey of librarians will enable the researchers to gain a broad understanding of current perspectives on data literacy demands, as well as challenges and needs regarding the development and implementation of data literacy instruction. The survey will ask how librarians perceive their preparedness to address undergraduate students' data literacy needs and the extent to which they are attempting or plan to incorporate data literacy into their existing literacy programs. Survey participants will be solicited via email message through various listservs, including Association of College & Research Libraries (ACRL)' Community and Junior College Libraries Section (CJCLS) listserv. Surveys will be completed from a diverse mix of college types, sizes, and locations.
- 3) Focus Groups with CC Faculty: Focus groups with faculty will be conducted to gather faculty's attitudes toward the importance and relevance of data literacy for their students and perceptions of the role of the library in addressing data literacy needs. Teaching faculty from a variety of disciplines and departments will be recruited to examine whether there are disciplinary differences in faculty views and approaches to data literacy. Faculty participants will be solicited via email messages sent by our advisory panel members who are academic librarians. They will also encourage this email invitation to be shared with interested faculty members at other institutions, so that we can achieve a balance of representation in our focus groups. We will conduct a series of four focus groups with an anticipated attendance of seven to eight people in each group.
- 4) Focus Groups with CC Students: The focus groups with students will serve as a needs assessment to reveal the conceptions of data literacy held by undergraduate students and their self-views on their data literacy skills. Researchers will conduct a series of four focus groups, with anticipated attendance in each group of six to seven people. Student participants will be solicited via email messages sent by our advisory panel members who are academic librarians.

Project Team and Partners: The Project Team includes PI Dr. Jeonghyun Kim, Associate Professor of Information Science at UNT; Co-PI Dr. Sarah Evans, Assistant Professor of Library Science at UNT; and Co-PI Dr. Lingzi Hong, Assistant Professor of Data Science at UNT. The following librarians, who are currently engaging in information/data literacy instruction, have agreed to serve on our project's advisory panel: Marissa Saenz, Outreach & Instruction Librarian, Del Mar College Library; Dr. Yumi Shin, Coordinator, Lamar State College Port Arthur Library; Irena Klaić, Head Librarian, Austin Community College; and Dr. Martha López Coleman, Director of Library Services, Thomas W. Cole Library, Wiley College. We plan to invite more scholars and practitioners from different regions who can offer insights and guidance to work at major milestones of the project.

Diversity Plan

The project team will consider CC libraries of all sizes and locations to ensure diversity. In addition, the project will seek both focus group and survey participation from CC librarians of all ethnicities, genders, ages, and experiences. As staff from underrepresented groups often have higher service loads with no commensurate compensation (Senteio, 2021), we will provide financial support to cover focus group interview time. Additionally, we will attempt to include representation of faculty from institutions that serve underrepresented groups. We will work with our target CC's Diversity Officers, who will help recruit student participants to ensure diversity and inclusion in our project.

Project Results

Upon conclusion of this project, we will create a white report that compiles the findings of focus group interviews and survey as well as at least two articles for formal publication. We intend to share the white paper by publicizing it through various relevant organization venues, such as the CJCLS blog (<https://acrl.ala.org/cjcls/>). We will also create a short YouTube video describing the findings of each phase.

Budget

We request a total budget of \$96,428. This budget estimate includes \$36,066 for one graduate student's salary and benefits; \$13,640 for one graduate student's tuition; \$9,891 for PI/Co-PI summer support; \$4,000 for PI/Co-PI travel support; \$13,000 for payments for advisory board, focus group participants, and selected survey participants; and \$19,831 for indirect costs.

References: American Association of Community Colleges (2021). *Fast facts 2022*. <https://www.aacc.nche.edu/research-trends/fast-facts/>; Burress, T., Mann, E., & Neville, T. (2020). Exploring data literacy via a librarian-faculty learning community: A case study. *Journal of Academic Librarianship*, 46(1). <https://doi.org/10.1016/j.acalib.2019.102076>; Kim, J., Hong, Lingzi, & Evans, S. (2021). *Defining data literacy: An empirical study of data literacy dimensions*. Presentation at ALISE 2021 Annual Meeting; National Academies of Science, Engineering, and Medicine (2018). *Data science for undergraduates: Opportunities and options*. Washington, DC: The National Academies Press; Senteio, C. R., Montague, K. E., Campbell, B., Campbell, T. R., & Seigerman, S. (2021). Enhancing racial equity in LIS research by increasing representation of BIPOC. *Education for Information*, 37(2), 247-256.