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Undergraduate Research: Librarian Mentorship of Undergraduate Research

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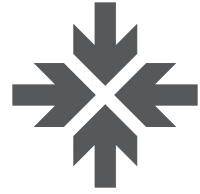Follow this and additional works at: https://digitalcommons.bucknell.edu/fac_books

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Undergraduate Research

Librarian Mentorship of Undergraduate Research

Courtney Paddick and Carrie Pirmann

Introduction

Libraries are at the heart of academic institutions; they exist to support university curricula as well as student and faculty research. Although students may engage in research as part of class assignments, highly focused, intensive research programs can have a more significant impact on students' learning and development of critical information literacy skills. While libraries and undergraduate research programs are natural partners, the library is often placed in a support role vis-à-vis research programs and initiatives. Anthony Stamatoplos contended, "Undergraduate research presents opportunities for librarians to extend their reach on campus and engage a larger number and broader range of students, faculty, and disciplines…. Librarians must be open to new and creative strategies for contributing to education and scholarship. The result should be not only greater involvement but also greater impact in the academic community."[1]

Undergraduate research opportunities are often presented as a faculty-driven endeavor, in which students contribute to faculty research;[2] less common is a model in which students conceptualize and direct their own research. In cases of student-directed research, faculty are usually still present as the primary mentors, with librarians consulted on an as-needed basis. However, other models of undergraduate research can be equally impactful. At Bucknell University, librarians developed the Digital Scholarship Summer Research Fellows (DSSRF) program, an eight-week intensive research experience that provides students with an opportunity to undertake independent research on a topic of their own choosing and teaches them about digital tools and methodologies that can be used to both answer questions and convey their research findings. This chapter situates

the DSSRF program in the context of high-impact practices, discusses the formation of the program and key elements such as collaboration, and offers suggestions for the assessment of librarian-led undergraduate research programs.

Literature Review

The Association of American Colleges and Universities (AAC&U) first outlined the high-impact educational practices in its 2007 report, *College Learning for a New Global Century*.[3] Since the publication of the AAC&U report, the role of high-impact practices has been widely reported in the literature and documented in the National Survey of Student Engagement (NSSE). Less well documented is the role of libraries and librarians in high-impact practices, and in particular, their role in undergraduate research. Through engagement in undergraduate research, students hone their critical and analytical thinking processes and develop a deeper understanding of the disciplines in which they are researching. As described by Hensley and Davis-Kahl, undergraduate research enables students to "connect the dots between their interests, general education courses, writing requirements, major coursework, and the habits of mind they learn in the process of becoming a 'disciplinary insider.'"[4]

With the growth of undergraduate research opportunities on campuses, libraries and librarians are uniquely positioned to support undergraduate research via access to materials both in-house and through interlibrary loan and via provision of information literacy instruction and one-on-one research consultations. In order to determine the extent of librarian involvement in undergraduate research, Hensley, Shreeves, and Davis-Kahl surveyed 281 library directors at higher education institutions and asked them to identify how their libraries provided support for undergraduate research programs through space, instruction, collections, extended loan periods, design of and printing of research posters and publications, publishing support, dissemination and preservation, and awards.[5] Over two-thirds of respondents identified their library as providing support for undergraduate research programs, and another 2.5 percent indicated they were in the planning stages of support.[6] However, the level and type of support libraries provide to undergraduate research is not consistent across types of institutions, and many libraries seek to adapt existing services to support undergraduate researchers rather than providing new services.[7]

Librarians at Hope College studied the impact of library services on undergraduate student researchers across the arts, humanities, and social science disciplines. They found that while students made good use of library resources in their work, they would have benefited from more interaction with librarians while engaged in their research programs. When asked about additional avenues for support, 42 percent of students were receptive to the idea of having a "personal research librarian" assigned to them who could support and mentor them in the research process. Students also suggested that in research-intensive courses, particularly capstones or honors seminars, that meeting with a librarian be a required component, again as a model of both extensive support and mentorship.[8]

The development of unique services and programs for undergraduate researchers often occurs in conjunction with new, larger initiatives on campus. At Amherst College,

a Mellon Foundation grant in 2010, coupled with a wave of new faculty hirings and the addition of two instruction librarians, provided the impetus for increased librarian involvement in the college's undergraduate research program.[9] Librarians were embedded in a pilot program of research seminars for sophomores and juniors in the humanities and social sciences. The courses included a voluntary, highly popular summer research component, which has transformed the library into the hub of summer research activity and has led to the convening of librarian-led "weekly Research Table meetings for students to share progress, ask questions, and learn from peers."[10] At Duke University, the impetus for increased librarian involvement in the undergraduate thesis writers program came directly from a goal set forth by the administration in 2005, to "double the number of undergraduates who complete honors theses or projects and thereby 'graduate with distinction.'"[11]

In addition to supporting undergraduate research through information literacy instruction and one-on-one consultations, librarians are uniquely positioned to support students through later stages of the research life cycle, including presentation and dissemination of the results of their research. Librarians at the Kresge Physical Sciences Library at Dartmouth College created a series of workshops that prepare students to present at a campus research symposium. Through workshop offerings on topics such as poster preparation, scientific communication, and presentation practice sessions, students are better prepared to discuss their research with a broad audience.[12] At the University of Colorado at Colorado Springs, the Kraemer Family Library was interested in hosting publishing services at its institution. However, through a survey of faculty, the librarians determined there was little interest in open access journals for faculty scholarship, but 73 percent of faculty were in favor of a student journal for undergraduate research.[13] The *Undergraduate Research Journal* is unique in the fact that it is not only library-hosted but also library-run. The Kraemer Family Library is responsible for all aspects of the journal including soliciting and editing papers, organizing each issue, and marketing.[14] While the journal is a time-intensive undertaking, it aligns with library and university goals to support student success. Farney and Byerley contended that "publishing an open access journal is an attainable goal for any academic library that can dedicate the time, technology, and staff."[15]

Partnerships between offices of undergraduate research and libraries have become more common as undergraduate research becomes a more highly valued activity. The University of South Florida's Office of Undergraduate Research (OUR) was relocated to the library's Learning Commons; this location has facilitated numerous collaborations between OUR and librarians. In one example, librarians and OUR staff worked together to establish the Undergraduate Research Experiences Library Program (URELP), an opportunity that allows students to "work closely with librarians to develop projects based on their interests and to identify library collections of interest."[16] With librarians as facilitators of URELP, students receive significant instruction in the research process, which aligns with the learning goals of the program. Specifically, librarians support the students in their development of skills in the areas of searching for information, evaluating sources, and synthesizing evidence from various sources to produce a tangible research project.[17] At some institutions, libraries and offices of undergraduate research

have also partnered to offer prizes to students whose research projects make exemplary use of library collections and demonstrate sophisticated research skills.[18]

These examples of library support of undergraduate research rely on traditional modes of engagement with students, with adjustments that take into account the differences in the types of research students engage in outside the classroom. Stamatoplos discussed the role of librarians supporting the mentoring process, noting, "It is imperative that librarians understand the dynamics of mentoring and find ways to support and enhance those relationships."[19] The idea of *support* repeatedly comes up in the literature, but few are discussing the librarian in the role of *mentor*. However, there are scenarios in which librarians can serve as mentors for undergraduate research. Many libraries have unique collections that can serve as excellent starting points for research projects. In these cases, it makes sense that librarians or archivists who have extensive knowledge about the materials would lead the research activities. Grand Valley State University Library's Scholars Summer Program "provides students with the opportunity to have an intensive research experience using the library's resources and collections" with direction provided by a librarian faculty mentor.[20] The Ohio State University Libraries Undergraduate Research Fellowship runs a similar program during the summer, which "provides students [with] hands-on involvement in the communication and dissemination of scholarship carried out by academic research libraries."[21] Millersville University's Library Research Fellows program takes a unique approach in that it introduces undergraduate students to the research process and develops them into peer mentors within their disciplines. Over the course of several semesters, students complete independent research projects, provide peer-to-peer mentoring, and share their research with an external audience. Throughout this process, "communities of practice in the library emerge as fellows successfully mentor their peers, grow as scholars, assist students in first-year seminars, serve as resources for peers in their disciplines, and mentor new research fellows."[22]

Another opportunity for librarians to work closely with undergraduate research has emerged from the field of digital humanities (DH) and digital scholarship (DS). At many colleges and universities, including Bucknell, the digital scholarship center is housed in the library. Digital scholarship centers are often a collaborative enterprise between faculty, librarians, instructional technologists, programmers, and other relevant staff. Over the last several years, programs have begun to crop up that involve librarian-led undergraduate digital scholarship programs. Some of those programs include Gettysburg College's Digital Scholarship Summer Fellows and Lafayette College's Digital Humanities Summer Scholars.[23]

Librarians' involvement in digital humanities and digital scholarship has been expanding over the past decade or more, a natural outgrowth of the increased presence of DH and DS programs and centers. For librarians who are not trained in the methods and tools used in DH and DS projects (e.g., GIS, text analysis, data visualization), participating in this work can serve as an opportunity for learning and a means of utilizing subject expertise. Librarians have vast experience in providing research support, curating materials, organizing information, and applying metadata standards, all avenues through which they can engage with DH and DS projects and bring their own skill sets to bear on the process.[24] Fostering a culture of collaboration around digital humanities and digital scholarship projects is even more critical in the liberal arts college environment,

where resources are often shared across divisions. Christina Bell argued, "The library is a natural place to form the type of collaborative team that can bring the methods, practices, and tools of digital scholarship to a small college."[25] Further, relying on the collaborative approach to supporting digital scholarship is necessary in practical terms. Projects typically vary in the type of support and expertise required, and no one person can be expected to have all the skills necessary to support every project.[26]

Digital Scholarship Summer Research Fellows Program

Bucknell University is a predominantly undergraduate institution offering liberal arts, sciences, and professional programs. The university is home to three colleges: Arts & Sciences, Engineering, and the Freeman College of Management; the majority of students are enrolled in the College of Arts & Sciences. In 2013, the university received a grant from the Andrew W. Mellon Foundation to support its digital scholarship initiative.[27] The DSSRF program is an outgrowth of our larger digital scholarship initiative and is designed as an intentional means of engaging undergraduate students in an immersive research experience. Undergraduate research opportunities figure heavily into the student experience at Bucknell: in the 2017 National Survey of Student Engagement (NSSE), 52 percent of Bucknell seniors who responded reported they had engaged in research with a faculty member.[28] Although the university offers a number of summer research programs, there are fewer opportunities for students interested in digital scholarship, humanities, or interdisciplinary research. With this in mind, we created DSSRF to broaden research opportunities for students and introduce them to new ways of engaging in scholarship.

With the Mellon grant to help facilitate the growth of digital scholarship at Bucknell, librarians were encouraged to become more directly involved in digital scholarship projects and the growth of digital pedagogy within the classroom. Prior to our work developing and facilitating the DSSRF program, the authors assisted with digital scholarship projects as part of our work as subject librarians. We were able to bring a unique skill set to these projects, drawing upon our research and information literacy skills and knowledge. The 2016 Bucknell University Digital Scholarship Conference exposed us to another entry point into digital scholarship. Librarians and students from Gettysburg College and Lafayette College presented on their librarian-led digital scholarship research programs and how those programs facilitated the growth of students as researchers. Seeing the student presenters from Gettysburg and Lafayette display such enthusiasm and passion about their projects and a deep understanding of how digital scholarship methods and digital tools enhance research was both eye-opening and enlightening.

Taking inspiration from the programs at Gettysburg and Lafayette,[29] we envisioned a librarian-led program that introduces students to digital scholarship tools and methodologies and equips them with the skills necessary to undertake an independent, digitally based research project. The DSSRF program incorporates the expertise of staff from various departments across our Library and IT organization to give students an engaging and transformative educational experience. An eight-week, full-time summer fellowship,

the program functions on a cohort model, bringing together student participants for discussions about digital scholarship and workshops focused on some of the commonly used digital scholarship methods and tools (e.g., text analysis, data visualization). Without competing demands of the regular academic term, our summer research program afforded us the "opportunity to cultivate a student culture that is built around the shared experience of academic inquiry."[30]

With several competing summer research opportunities available on campus, we sought to make our application and selection process as inclusive as possible. Based on funding and how many students we could adequately support, we recruited a cohort of four. We opened the call to all rising sophomores, juniors, and seniors from any major. Although the fellows were conducting independent research, we also required they identify a faculty member who could serve as a reference and provide consultation during the summer. As librarians, we are equipped to provide students with guidance in defining research questions and finding appropriate resources, but we often lack the in-depth disciplinary knowledge of a faculty member. Having a faculty member's expertise at hand ensured that each student had the necessary support to complete a successful project.

After the initial screening of applications, we invited select students to interview with us. We also invited colleagues with experience in digital humanities and digital scholarship to be part of the process of selecting the fellows. The interviews gave us an opportunity to determine if the students' proposed projects could be completed over an eight-week session and if we had the necessary expertise within Library and IT to support them. We specifically sought students with a strong interest in their selected topic and the maturity to work independently, as well as collaboratively within a cohort environment. According to Brownell and Swaner, of the high-impact practices, "undergraduate research has most often been targeted to underrepresented students in higher education."[31] While the DSSRF call for participants did not specifically target underrepresented students, we ultimately ended up with a very diverse cohort.

Our program is curricular-based and structured so students and facilitators meet for ten to twenty hours per week, with meetings occurring more frequently in the earlier weeks of the fellowship. Students were not required to have any previous knowledge of digital scholarship methods or tools to apply for the program, so we structured the curriculum to develop a baseline of knowledge in the early weeks. The cohort meetings included a mix of discussion around common readings, exploration of extant DH and DS projects, and hands-on learning of specific tools. We also built in time at least once a week for students to share their progress with each other through discussion of their research and, as the summer progressed, demonstrations of their draft project sites. To encourage reflection, we provided students with weekly prompts to which they responded on our blog.[32] Students were given ample time to work independently on their research and meet with library staff and their faculty mentors for additional support. The balance of cohort meetings with independent research time allowed students to work at their own pace on their projects, while also receiving support and encouragement from their peers.

The cohort model also leads naturally to the development of a community of practice, defined as a "group of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly."[33] The concept of community of practice implies a deeper engagement and interchange of ideas between students than

what one might experience in a traditional classroom setting. Within the cohort, the student fellows worked together to help each other understand various digital tools, focusing not just on their functions, but also on how the tools could be applied or why a specific tool was well suited to a project. Our fellows also engaged in meaningful conversations and debate around issues in digital scholarship and, drawing on the work of Lisa Spiro,[34] defined their own values for the program.[35] We further extended the building of a community of practice through two visits to nearby liberal arts colleges that also host digital scholarship summer internship programs.

There are a number of ways the DSSRF program speaks directly to the model of high-impact practices:[36]

- **High performance expectations** for students to conceive of and carry out a research project while applying digital scholarship tools and methods learned in the program
- **Significant investment of time and effort by students** over the course of the eight-week program
- **Interactions with faculty and peers about substantive matters** during one-on-one meetings, cohort discussions, and meetups with other students
- **Experiences with diversity** through required readings and discussions
- **Frequent**, **timely, and constructive feedback** through weekly check-ins, peer review, and project evaluations
- **Periodic structured opportunities to reflect and integrate learning** during cohort discussions and scaffolding of the fellows' curriculum
- **Public demonstration of competence** in the form of presentations to the campus community and conference presentations

As a result of experiencing these elements of high-impact practices, students honed their skills in a number of key areas necessary for success after graduation. In particular, DSSRF stresses the development of self-direction, self-motivation, writing and critical-thinking skills, oral communication, and teamwork—all proficiencies that will benefit students in the workplace or future educational endeavors.[37]

Collaboration

Bucknell is home to a merged library and information technology organization, which gives us the advantage of having colleagues with a diversity of expertise and experience. As facilitators, we relied on a number of our colleagues to lead workshops and support the work of our student fellows. Most of the staff who worked with DSSRF came from departments that traditionally support student learning (e.g., Research Services, which houses our librarians; Digital Pedagogy and Scholarship, which houses staff who support digital teaching and research). However, having our IT colleagues close at hand proved invaluable, as we were able to rely on the knowledge of a staff member from our business intelligence team to teach our students Tableau, a powerful data visualization software. Inviting our colleagues to lead sessions on topics such as text analysis and data visualization also gave us an opportunity to learn alongside the students. In addition to staff who supported the program through workshop sessions, we also paired each student with a librarian other than ourselves for support in critical stages of the research process, such

as developing and refining researchable questions and locating background literature on their topics. Students relied on their faculty mentors throughout the program for guidance on discipline-specific questions and gained a greater appreciation for how faculty can support individual student research. Creating a library-led undergraduate summer research program is a rewarding, but also a labor-intensive process. By leveraging the staff resources available to us, we modeled to students our own community of practice while also making sure the workload did not fall to one person.

Building on the theme of creating a community of practice, our program also incorporated interinstitutional collaboration. Halfway through the program, our students participated in a one-day digital scholarship meetup hosted by Bryn Mawr College, which brought together a few dozen students and program facilitators to discuss projects in progress. This was a unique opportunity for our students to connect with their peers who were participating in similar programs at institutions including Bryn Mawr College, Haverford College, Lafayette College, and Swarthmore College. The students gave lightning talks on their projects, provided peer-to-peer feedback, and learned more about the larger digital scholarship community.

We participated in a second, similar meetup with students in Gettysburg College's Digital Scholarship Summer Fellows program. Since this visit occurred a couple of weeks before the end of our respective programs, we engaged the students in a brief workshop on elevator speeches, which served as preparation for their final project presentations. This also gave students an opportunity to get to know one another and become familiar with each other's projects, which set the stage for more in-depth work through peer evaluations and project workshopping. Having fresh sets of eyes on the projects meant that everyone came away with good feedback and suggestions for improvements they could make to their work. Mahony and Pierazzo argued for this multipronged approach in the teaching of digital humanities: "In addition to acquiring key research methodologies and skills, students need to develop their collaborative and interdisciplinary skills—skills that are increasingly required within and outside the academy. Thus there is a real need for training students in collaborative methods and reflective practices in order to build a community of learning that will lead to a community of practice."[38]

Outcomes Assessment

Numerous studies have reported on the impact that participating in undergraduate research and high-impact practices has on students. The Summer Undergraduate Research Experience (SURE) survey, developed by David Lopatto, provides students in the sciences the opportunity to self-report the impact participating in summer undergraduate research has had on their skill development, overall educational experience, and future career pathways.[39] The results of the SURE survey "indicate that most research experiences enhance intellectual skills such as inquiry and analysis, reading and understanding primary literature, communication, and teamwork."[40] The SURE survey has been administered to summer undergraduate researchers at a number of institutions, but is limited due to the fact it is administered only to students in the sciences and there is no comparison with students not engaged in undergraduate research.

Other studies have taken a longitudinal approach and have included students who did not participate in undergraduate research alongside those who did. A study of University of Delaware alumni found that students who participated in the Undergraduate Research Program reported "significantly greater enhancement for eight specific cognitive and personal skills and abilities compared to alumni with no research experience."[41] Alumni who participated in the Undergraduate Research Program also reported higher satisfaction with their undergraduate experience and were more likely to pursue graduate study than alumni who did not self-report an experience with undergraduate research.[42] Although these studies are not based on large data sets, they do provide insight into the types of questions we would like to ask undergraduate researchers in our program.

Within DSSRF, the assessment of both the program as a whole and the progress of our fellows' research was conducted on an informal basis. The facilitators and fellows met several times a week; we asked the students to provide updates on their progress, roadblocks, and questions. The frequency of our meetings allowed us to address issues in a timely manner, and having the support of our colleagues enabled us to put the fellows in touch with the appropriate staff member at the point of need. The weekly blog posts provided another opportunity for reflection, and we encouraged the students to write about both their successes and their failures.

There were also several opportunities for students to receive feedback from staff beyond the facilitators of the program. At various points, students met with their faculty mentors, assigned librarians, and Library and IT staff. Through these meetings, students continually received comments and assessment on their research design and methodology. During the sixth week of the program, we invited colleagues who had not worked with the fellows to evaluate the projects in their current state. The programs at Bucknell, Lafayette, and Gettysburg all have a final presentation requirement in which students present their work to members of the campus community. While the presentations provide an opportunity for students to receive feedback from the audience, Gettysburg formalized the process by requesting the audience to provide written feedback to the students.[43] With the faculty mentors in the audience, this would be a particularly compelling assessment piece to add to future iterations of the program.

The blogging, weekly check-ins, and project evaluations provided the fellows with a steady stream of feedback on their progress and enabled the facilitators to evaluate the structure of the program and make adjustments as needed throughout the summer. Since it was the first iteration of the program, we relied on the reflections of the students to determine what aspects of the program worked and what aspects needed to be adjusted or eliminated in future years. While we have anecdotal evidence of the success of the program, we intend to be more intentional with assessment in the future. As part of the Digital Scholarship Summer Fellows program at Gettysburg, students were asked to "complete written evaluations at the fellowship midpoint and again at the end of the summer."[44] In the Digital Humanities Summer Scholars program at Lafayette, participants completed evaluations of the program and "design[ed] their ideal 'summer scholar program.'"[45] While we had an informal assessment discussion at the end of the program, in the future we will incorporate more formalized feedback, based on Gettysburg's model. As more students go through the program, we will better be able to track its impact.

Conclusion

Although this chapter situates librarian-led undergraduate research in the context of digital scholarship and digital humanities, librarians have a wealth of resources and skills that they can bring to bear on research programs of all types. Stamatoplos argued for librarians' close involvement in undergraduate research, calling them, "a critical ally in the research process and a welcome guide to a more sophisticated approach to scholarship. The librarian can make a significant contribution to what is an inquiry-based model of teaching and learning both at the campus level and throughout the research community."[46] In framing librarian-led undergraduate research programs, librarians might consider specialized collections or resources housed locally that can serve as a starting point for research projects, or they might seek out partnerships with offices of undergraduate research to assist in the development of programs. Starting with intentional involvement in an existing undergraduate research program also holds substantial value and can help pave the way to the creation of a stand-alone, librarian-led initiative.

As we developed the Digital Scholarship Summer Research Fellows program, our goal was to create an undergraduate research opportunity that enabled students to pursue research in an area of their choosing, while learning and integrating digital tools and methodologies into their projects. In this case, we were successful. All fellows produced a digital instance of their research; in most cases these finished products are something that could be easily extended into a larger research project. We emphasized throughout the process that the projects needed to be scaled to a size that was feasible to complete in eight weeks. Since the conclusion of the fellowship, the students have presented their research in on-campus venues and at conferences.

We specifically selected a cohort of students who had deep interest in their topics. This ensured they would remain motivated throughout the summer and possibly continue their research beyond the time frame of the program. One of our students worked with a professor during the fall semester to enhance her project and then presented her findings at an on-campus symposium. Another student will be using the work he completed to inform and frame his senior thesis, and a graduating senior used his project to showcase his skill set to prospective employers. The close work with Library and IT staff was something all the students pointed to as a positive aspect of the program and has led to new opportunities for some of them. One of our students assisted with a GIS project, while another student will serve as the executive intern to the Vice President of Library and IT during the 2018–2019 school year. Given these successes, we feel we have exceeded our own expectations and expected outcomes of the program.

Notes

1. Anthony Stamatoplos, "The Role of Academic Libraries in Mentored Undergraduate Research: A Model of Engagement in the Academic Community," *College and Research Libraries* 70, no. 3 (2009): 246.
2. Todd McDorman, "Promoting Undergraduate Research in the Humanities: Three Collaborative Approaches," *CUR Quarterly* 25 (2004): 39.
3. National Leadership Council for Liberal Education and America's Promise, *College Learning for the New Global Century* (Washington, DC: Association of American Colleges and Universities, 2007).

4. Merinda Kaye Hensley and Stephanie Davis-Kahl, "Introduction," in *Undergraduate Research and the Academic Librarian: Case Studies and Best Practices*, ed. Merinda Kaye Hensley and Stephanie Davis-Kahl (Chicago: Association of College and Research Libraries, 2017), xxii.

5. Merinda Kaye Hensley, Sarah L. Shreeves, and Stephanie Davis-Kahl, "A Survey of Library Support for Formal Undergraduate Research Programs," *College and Research Libraries* 75, no. 4 (2014): 438.

6. Hensley, Shreeves, and Davis-Kahl, "Survey of Library Support," 429, 431.

7. Hensley, Shreeves, and Davis Kahl, "Survey of Library Support," 431.

8. Todd J. Wiebe, "The Library and Undergraduate Research in the Liberal Arts: Present Contributions and Future Opportunities," *College and Undergraduate Libraries* 23, no. 3 (2016): 223–51.

9. Missy Roser and Sara Smith, "A Triumph, a Fail, and a Question: A Pilot Approach to Student-Faculty-Librarian Research Collaboration," in *Undergraduate Research and the Academic Librarian: Case Studies and Best Practices*, ed. Merinda Kaye Hensley and Stephanie Davis-Kahl (Chicago: Association of College and Research Libraries, 2017), 29.

10. Roser and Smith, "A Triumph, a Fail, and a Question," 33.

11. Emily Daly, "Is the Library Part of the Picture? Asking Honors Undergrads to Describe Their Research Processes," *College and Research Libraries News* 72, no. 7 (2011): 408.

12. Lora Leligdon and Katie Harding, "Supporting Undergraduate Research Symposia in the Sciences: Integrated Library Programming and Services," *Science and Technology Libraries* 36, no. 4 (2017): 390–401.

13. Tabatha A. Farney and Suzanne L. Byerley, "Publishing a Student Research Journal: A Case Study," *portal: Libraries and the Academy* 10, no. 3 (2010): 324.

14. Farney and Byerley, "Publishing a Student Research Journal," 326.

15. Farney and Byerley, "Publishing a Student Research Journal," 334.

16. Lisa Piazza, Drew Smith, and Richard Pollenz, "Librarians Partner across Campus to Support Undergraduate Research," *Council on Undergraduate Research Quarterly* 36, no. 4 (2016): 4.

17. Piazza, Smith, and Pollenz, "Librarians Partner across Campus," 5.

18. "Charlene Conrad Liebau Library Prize for Undergraduate Research," University of California Berkeley Library, accessed August 14, 2018, http://www.lib.berkeley.edu/researchprize; "Consortium Library Award for Undergraduate Research," University Honors College, University of Alaska Anchorage, accessed August 14, 2018, https://www.uaa.alaska.edu/academics/honors-college/ours/research-opportunities/consortium-library.cshtml; "Library Award for Undergraduate Research," University of Nebraska, Kearney Calvin T. Ryan Library, accessed August 14, 2018, http://library.unk.edu/about_us/library_award.php.

19. Stamatoplos, "Role of Academic Libraries," 245.

20. "GVSU Library Scholars Summer Program," Grand Valley State University, last modified January 25, 2018, https://www.gvsu.edu/ours/gvsu-library-scholars-summer-program-842.htm.

21. "Undergraduate Research Library Fellowship," Ohio State University, accessed April 9, 2018, https://library.osu.edu/urlf.

22. "Library Research Fellows," Millersville University, last modified September 8, 2017, https://blogs.millersville.edu/libraryresearchfellows/ .

23. Janelle Wertzberger and R. C. Miessler, "Dreaming Big: Library-Led Digital Scholarship for Undergraduates at a Small Institution," in *Undergraduate Research and the Academic Librarian: Case Studies and Best Practices,* ed. Stephanie Davis-Kahl and Merinda. K. Hensley (Chicago: Association of College and Research Libraries, 2017), 83–92; Sara Morris, "The Digital Humanities Summer Scholarship: A Model for Library-Led Undergraduate Digital Scholarship," *College and Undergraduate Libraries* 24, no. 2–4 (2017): 532–44.

24. Micah Vandegrift and Stewart Varner, "Evolving in Common: Creating Mutually Supportive Relationships between Libraries and the Digital Humanities," *Journal of Library Administration* 53, no. 1 (2013): 67–78; Zoe Borovsky and Elizabeth McAulay, "Digital Humanities Curriculum Support inside the Library," in *Digital Humanities in the Library: Challenges and Opportunities for Subject Specialists*, ed. Arianne Hartsell-Gundy, Laura Braunstein, and Liorah Golomb (Chicago: Association of College and Research Libraries, 2015), 69–82.

25. Christina Bell, "In Practice and Pedagogy: Digital Humanities in a Small College Environment," in *Digital Humanities in the Library: Challenges and Opportunities for Subject Specialists*, ed. Arianne

Hartsell-Gundy, Laura Braunstein, and Liorah Golomb (Chicago: Association of College and Research Libraries, 2015), 104.

26. Nancy Aarsvold, Kasia Gonnerman, and Jason N. Paul, "Shaping the Roles of Academic Librarians to Meet Emerging Demands of DH Scholarship," in *Supporting Digital Humanities for Knowledge Acquisition in Modern Libraries*, ed. Kathleen L. Sacco, Scott S. Richmond, Sara M. Parme, and Kerrie Fergen Wilkes (Hershey, PA: IGI Global, 2015), 48.

27. Digital Pedagogy and Scholarship, "History of the Program," accessed November 25, 2019, http://dps.bucknell.edu/digital-scholarship-at-bucknell/history-of-the-program/.

28. Bucknell University Office of Institutional Research and Planning, "External Comparisons," accessed November 25, 2019, https://www.bucknell.edu/institutional-research-planning/student-outcomes-assessment/educational-goals-outcomes/external.

29. "Digital Scholarship Summer Fellows 2016," Mussleman Library, Gettysburg College, last modified 2016, http://dssf.musselmanlibrary.org/2016/; "Digital Scholarship Summer Fellows 2017," Mussleman Library, Gettysburg College, last modified 2017, http://dssf.musselmanlibrary.org/2017/; "Digital Humanities Summer Scholars," Lafayette College, last modified June 29, 2017, https://sites.lafayette.edu/dhss/.

30. Joseph L. Murray, *Undergraduate Research for Student Engagement and Learning* (New York: Routledge, 2018), 11.

31. Jayne E. Brownell and Lynn E. Swaner, *Five High-Impact Practices* (Washington, DC: Association of American Colleges and Universities, 2010), 31.

32. Carrie Pirmann et al., "Digital Scholarship Summer Research Fellows 2017 Reflections," last modified July 2017, http://dssrf.blogs.bucknell.edu/category/blog/.

33. Etienne Wenger-Trayner and Beverly Wenger-Trayner, *Communities of Practice* (Wenger-Trayner, April 15, 2015), 1, http://wenger-trayner.com/wp-content/uploads/2015/04/07-Brief-introduction-to-communities-of-practice.pdf.

34. Lisa Spiro, "'This Is Why We Fight': Defining the Values of the Digital Humanities," in *Debates on the Digital Humanities*, ed. Matthew K. Gold (Minneapolis: University of Minnesota Press, 2012), 16–35.

35. Rennie Heza et al., "Digital Scholarship Summer Research Fellows 2017 Manifesto," Bucknell University, last modified July 2017, http://dssrf.blogs.bucknell.edu/.

36. George D. Kuh, Ken O'Donnell, and Sally Reed, *Ensuring Quality and Taking High-Impact Practices to Scale* (Washington, DC: Association of American Colleges and Universities, 2013).

37. *How Should Colleges Prepare Students to Succeed in Today's Global Economy?* survey by Peter D. Hart Research Associates (Washington, DC: Association of American Colleges and Universities, January 2008), https://www.aacu.org/sites/default/files/files/LEAP/2008_Business_Leader_Poll.pdf.

38. Simon Mahony and Elena Pierazzo, "Teaching Skills or Teaching Methodology?" in *Digital Humanities Pedagogy*, ed. Brett D. Hirsch (Cambridge: Open Book Publishers, 2012), 215.

39. David Lopatto, "Undergraduate Research as a High-Impact Student Experience," *Peer Review* 12, no. 2 (2010): 27.

40. Lopatto, "Undergraduate Research," 27.

41. Karen W. Bauer and Joan S. Bennett, "Alumni Perceptions Used to Assess Undergraduate Research Experience," *Journal of Higher Education* 74, no. 2 (2003): 225.

42. Bauer, "Alumni Perceptions," 226.

43. Wertzberger and Miessler, "Dreaming Big," 88.

44. Wertzberger and Miessler, "Dreaming Big," 88.

45. Morris, "Digital Humanities Summer Scholarship," 542.

46. Stamatoplos, "Role of Academic Libraries," 240.

Bibliography

Aarsvold, Nancy, Kasia Gonnerman, and Jason N. Paul. "Shaping the Roles of Academic Librarians to Meet Emerging Demands of DH Scholarship." In *Supporting Digital Humanities for Knowledge Acquisition in Modern Libraries*. Edited by Kathleen L. Sacco, Scott S. Richmond, Sara M. Parme, and Kerrie Fergen Wilkes, 44–65. Hershey, PA: IGI Global, 2015.

Bauer, Karen W., and Joan S. Bennett. "Alumni Perceptions Used to Assess Undergraduate Research Experience." *Journal of Higher Education* 74, no. 2 (2003): 210–30.

Bell, Christina. "In Practice and Pedagogy: Digital Humanities in a Small College Environment." In *Digital Humanities in the Library: Challenges and Opportunities for Subject Specialists*. Edited by Arianne Hartsell-Gundy, Laura Braunstein, and Liorah Golomb, 103–26. Chicago: Association of College and Research Libraries, 2015.

Borovsky, Zoe, and Elizabeth McAulay. "Digital Humanities Curriculum Support inside the Library." In *Digital Humanities in the Library: Challenges and Opportunities for Subject Specialists*. Edited by Arianne Hartsell-Gundy, Laura Braunstein, and Liorah Golomb, 69–82. Chicago: Association of College and Research Libraries, 2015.

Brownell, Jayne E., and Lynn E. Swaner. *Five High-Impact Practices: Research on Learning Outcomes, Completion, and Quality.* Washington, DC: Association of American Colleges and Universities, 2010.

Bucknell University Office of Institutional Research and Planning. "External Comparisons." Accessed November 25, 2019. https://www.bucknell.edu/institutional-research-planning/student-outcomes-assessment/educational-goals-outcomes/external.

Daly, Emily. "Is the Library Part of the Picture? Asking Honors Undergrads to Describe Their Research Processes." *College and Research Libraries News* 72, no. 7 (2011): 408–11, 419.

Digital Pedagogy and Scholarship, "History of the Program," accessed November 25, 2019, http://dps.bucknell.edu/digital-scholarship-at-bucknell/history-of-the-program/.

Farney, Tabatha A., and Suzanne L. Byerley. "Publishing a Student Research Journal: A Case Study." *portal: Libraries and the Academy* 10, no. 3 (2010): 323–35.

Grand Valley State University. "GVSU Library Scholars Summer Program." Last modified January 25, 2018. https://www.gvsu.edu/ours/gvsu-library-scholars-summer-program-842.htm.

Hensley, Merinda Kaye, and Stephanie Davis-Kahl. "Introduction." In *Undergraduate Research and the Academic Librarian: Case Studies and Best Practices*. Edited by Merinda Kaye Hensley and Stephanie Davis-Kahl, xxi–xxvi. Chicago: Association of College and Research Libraries, 2017.

Hensley, Merinda Kaye, Sarah L. Shreeves, and Stephanie Davis-Kahl. "A Survey of Library Support for Formal Undergraduate Research Programs." *College and Research Libraries* 75, no. 4 (2014): 422–41.

Heza, Rennie, Minglu Xu, Tyler Candelora, and Justin Guzman. "Digital Scholarship Summer Research Fellows 2017 Manifesto." Bucknell University. Last modified July 2017. http://dssrf.blogs.bucknell.edu/.

Kuh, George D., Ken O'Donnell, and Sally Reed. *Ensuring Quality and Taking High-Impact Practices to Scale.* Washington, DC: Association of American Colleges and Universities, 2013.

Lafayette College. "Digital Humanities Summer Scholars." Last modified June 29, 2017. https://sites.lafayette.edu/dhss/.

Leligdon, Lora, and Katie Harding. "Supporting Undergraduate Research Symposia in the Sciences: Integrated Library Programming and Services." *Science and Technology Libraries* 36, no. 4 (2017): 390–401.

Lopatto, David. "Undergraduate Research as a High-Impact Student Experience." *Peer Review* 12, no 2 (2010): 27–30.

Mahony, Simon, and Elena Pierazzo. "Teaching Skills or Teaching Methodology?" In *Digital Humanities Pedagogy*. Edited by Brett D. Hirsch, 215–25. Cambridge: Open Book Publishers, 2012.

McDorman, Todd. "Promoting Undergraduate Research in the Humanities: Three Collaborative Approaches." *CUR Quarterly* 25 (2004): 39–42.

Millersville University. "Library Research Fellows." Last modified September 8, 2017. https://blogs.millersville.edu/libraryresearchfellows/.

Morris, Sarah. "The Digital Humanities Summer Scholarship: A Model for Library-Led Undergraduate Digital Scholarship." *College and Undergraduate Libraries* 24, no. 2–4 (2017): 532–44.

Murray, Joseph L. *Undergraduate Research for Student Engagement and Learning.* New York: Routledge, 2018.

Musselman Library, Gettysburg College. "Digital Scholarship Summer Fellows 2016." Last modified 2016. http://dssf.musselmanlibrary.org/2016/.

———. "Digital Scholarship Summer Fellows 2017." Last modified 2017. http://dssf.musselmanlibrary.org/2017/.

National Leadership Council for Liberal Education and America's Promise. *College Learning for the New Global Century*. Washington, DC: Association of American Colleges and Universities, 2007.

Ohio State University. "Undergraduate Research Library Fellowship." Accessed on April 9, 2018. https://library.osu.edu/urlf.

Peter D. Hart Research Associates. *How Should Colleges Prepare Students to Succeed in Today's Global Economy? Employers' Views on the Accountability Challenge.* Washington, DC: Association of American Colleges and Universities, January 2008. https://www.aacu.org/sites/default/files/files/LEAP/2008_Business_Leader_Poll.pdf.

Piazza, Lisa, Drew Smith, and Richard Pollenz. "Librarians Partner across Campus to Support Undergraduate Research." *Council on Undergraduate Research Quarterly* 36, no. 4 (2016): 4–9.

Pirmann, Carrie, Courtney Paddick, Rennie Heza, Minglu Xu, Tyler Candelora, and Justin Guzman. "Digital Scholarship Summer Research Fellows 2017 Reflections." Last modified July 2017. http://dssrf.blogs.bucknell.edu/category/blog/.

Roser, Missy, and Sara Smith, "A Triumph, a Fail, and a Question: A Pilot Approach to Student-Faculty-Librarian Research Collaboration." In *Undergraduate Research and the Academic Librarian*. Edited Merinda Kaye Hensley and Stephanie Davis-Kahl, 29–39. Chicago: Association of College and Research Libraries, 2017.

Spiro, Lisa. "'This Is Why We Fight': Defining the Values of the Digital Humanities." In *Debates on the Digital Humanities*. Edited by Matthew K. Gold, 16–35, Minneapolis: University of Minnesota Press, 2012.

Stamatoplos, Anthony. "The Role of Academic Libraries in Mentored Undergraduate Research: A Model of Engagement in the Academic Community." *College and Research Libraries* 70, no. 3 (2009): 235–49.

University Honors College, University of Alaska Anchorage. "Consortium Library Award for Undergraduate Research." Accessed August 14, 2018. https://www.uaa.alaska.edu/academics/honors-college/ours/research-opportunities/consortium-library.cshtml.

University of California Berkeley Library. "Charlene Conrad Liebau Library Prize for Undergraduate Research." Accessed August 14, 2018. http://www.lib.berkeley.edu/researchprize.

University of Nebraska, Kearney Calvin T. Ryan Library. "Library Award for Undergraduate Research." Accessed August 14, 2018. http://library.unk.edu/about_us/library_award.php

Vandegrift, Micah, and Stewart Varner. "Evolving in Common: Creating Mutually Supportive Relationships between Libraries and the Digital Humanities." *Journal of Library Administration* 53, no. 1 (2013): 67–78.

Wenger-Trayner, Etienne, and Beverly Wenger-Trayner. *Communities of Practice: A Brief Introduction*. Wenger-Trayner, April 15, 2015. http://wenger-trayner.com/wp-content/uploads/2015/04/07-Brief-introduction-to-communities-of-practice.pdf.

Wertzberger, Janelle, and R. C. Miessler. "Dreaming Big: Library-Led Digital Scholarship for Undergraduates at a Small Institution." In *Undergraduate Research and the Academic Librarian: Case Studies and Best Practices.* Edited by Stephanie Davis-Kahl and Merinda. K. Hensley, 83–92. Chicago: Association of College and Research Libraries, 2017.

Wiebe, Todd J. "The Library and Undergraduate Research in the Liberal Arts: Present Contributions and Future Opportunities." *College and Undergraduate Libraries* 23, no. 3 (2016): 223–51.