ENVIRONMENTAL SCAN 2019

By the ACRL Research Planning and Review Committee March 2019

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Introduction

Every two years, the ACRL Research Planning and Review Committee writes an Environmental Scan, a summary of the key themes in libraries and higher education. Many topics in this arena are in a state of perpetual change. This year's scan focuses largely on developments from the last two years (2017 and 20018) in long standing themes largely centered in the U.S. In some cases these build on last year's Top Trends[1] and there are a few instances of notable events that may indicate larger changes to come. The 2019 Environmental Scan will provide an overview for all librarians working in or with an interest in higher education. Since changes can unfold over years, those deeply interested in this landscape should also consult the RPRC documents for the last four years.[2] The footnotes provide a solid starting point for taking a deeper dive into these topics.

Student Characteristics
Student Demographics

According to the National Center for Educational Statistics, undergraduate enrollment in U.S. institutions of higher education is expected to increase by three percent over the next ten years. Between 2016 and 2027, undergraduate enrollment at 2-year institutions is projected to increase by twelve percent (from 6.1 million to 6.8 million students), while enrollment at 4-year institutions is projected to be two percent lower in 2027 than in 2016 (10.6 million students compared with 10.8 million students).[3]

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[1] ACRL Research Planning and Review Committee, "2018 Top Trends in Academic Libraries: A Review of the Trends and Issues Affecting Academic Libraries in Higher Education," *College & Research Libraries News* 79, no. 6 (2018), https://doi.org/10.5860/crln.79.6.286.

[2] "Environmental Scan 2015," Assocation of College and Research Libraries, 2015, http://www.ala.org/acrl/sites/ala.org.acrl/files/content/publications/whitepapers/EnvironmentalScan15.pdf.; Lisabeth Chabot et al., "2016 Top Trends in Academic Libraries a Review of the Trends and Issues Affecting Academic Libraries in Higher Education," (2016).; ACRL Research Planning and Review Committee, "Environmental Scan 2017," Association of College and Research Libraries, 2017, http://www.ala.org/acrl/sites/ala.org.acrl/files/content/publications/whitepapers/EnvironmentalScan2017.pdf.; "2018 Top Trends in Academic Libraries: A Review of the Trends and Issues Affecting Academic Libraries in Higher Education."

[3] *The Condition of Education: Undergraduate Enrollment* (2018), https://nces.ed.gov/programs/coe/indicator_cha.asp.

The composition of students is expected to diversify, but again this change is uneven. There is a projected growth in Hispanic enrollment but a decline in Black enrollment. As a percent of students, White enrollments will decline but still remain four times the enrollment of Black students and three times the enrollment of Hispanic students. Compared with the demographics of the U.S. by 2027, White students will still be disproportionately represented on college campuses.[4]

Choice of Major

What students are studying is changing as well, with an increased emphasis on health professions, biology, and engineering. For bachelor's degrees, there is a decline in the number of students graduating with degrees in humanities and social sciences while business degrees have remained flat from 2010-2016. Business remains the most popular major with 372,000 degrees conferred in 2015-16 compared to 229,000 in the health sciences and 161,000 in social sciences (other than psychology) and history.[5] At the 2-year college level, liberal arts is the most popular area of focus and has nearly doubled in the last fifteen years. The next most popular 2-year degrees are in health sciences and business.[6]

At highly-ranked schools, more students major in humanities and social sciences than their peers at less-selective schools. However, those at highly-ranked schools are also more likely to study hard sciences and engineering. While STEM jobs tend to provide higher salaries, they often require advanced degrees, which could be a barrier for lower-income students. Nearly 58% of biology and life sciences majors get graduate degrees.[7]

Generation Z

The generation cohort of in-coming students has shifted from the Millennial Generation to Generation Z which is people born from the mid-1990s to 2010.[8] Among the characteristics of this group most relevant to higher education are: concern about college costs, viewing college as

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[4] *The Condition of Education: Undergraduate Enrollment*.

[5] U.S. Institute of Education Sciences. National Center for Educational Statistics, *The Condition of Education: Undergraduate Degree Fields* (2018), https://nces.ed.gov/programs/coe/indicator_cta.asp.

[6] *The Condition of Education: Undergraduate Degree Fields*.

[7] Michelle Cheng, "Students at Most Colleges Don't Pick "Useless" Majors," FiveThirtyEight, 2017, https://fivethirtyeight.com/features/students-at-most-colleges-dont-pick-useless-majors/.

[8] Michael Dimock, "Defining Generations: Where Millennials End and Generation Z Begins," Fact Tank, Pew Research Center, 2019, https://www.pewresearch.org/fact-tank/2019/01/17/where-millennials-end-and-generation-z-begins/.

a gateway to a higher paying job, concern about global issues and societal problems, and intent to be an entrepreneur.[9]

Pragmatism about college is hypothesized to be a product of being of an early age during the recent recession. Students entering college now and for the next decade or so expect to learn practical skills for the workplace. Connected with this focus on practical skills is the desire to have an internship with an employer during their college years.[10] Anxiety about paying for college is a factor in pursuing majors that they believe will position them to get a post-college professional job and hopefully one that will pay off student loans. This doesn't mean that Generation Z is only motivated by money. This cohort is concerned about global and social issues such as climate change and racial equality and these concerns may be reflected in their choice of studies, research projects, and their co-curricular activities.[11]

While the Millennials were "born digital," Generation Z has grown up with smart phones, streaming media, and online social networks. They are immersed in online video and streaming audio and have some expectations that technology is incorporated into their course instruction.[12] With the instant connectedness of texting, Instagram, and the like comes a degree of social isolation. Hanging out with friends is often an online occurrence outside of school activities. This generation is less likely to have paid work during high school which is a situation that will impact student workers and their employers as this group learns basic job issues such as workplace communications and expectations for behavior and performance.[13] Generation Z is also less likely than recent previous generations to have used alcohol or drugs during high school. Overall, they are considered less hedonistic and more serious in their worldview.

Implications

- Shifts in student choice of major may change campus hiring and research priorities which could affect library collection decisions. This might also affect the areas of demand for support for research and instruction librarians.

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[9] Jayne Blodgett, "Taking the Class out of the Classroom: Libraries, Literacy, and Service Learning," ed. Pete McDonnell, *The Experiential Library* (Chandos Publishing, 2017), https://digscholarship.unco.edu/libfacpub/8/.

[10] Elaina Loveland, "Instant Generation," *Journal of College Admission*, https://www.nacacnet.org/news--publications/journal-of-college-admission/instant-generation/.

[11] "Instant Generation."

[12] Katherine J. Mohr and Eric S. Mohr, "Understanding Generation Z Students to Promote a Contemporary Learning Environment," *Journal on Empowering Teaching Excellence* 1, no. 1 (2017), https://doi.org/10.15142/T3M05T.

[13] Gretchen Livingston, "The Way U.S. Teens Spend Their Time Is Changing, but Differences between Boys and Girls Persist," Fact Tank, Pew Research Center, 2019, https://www.pewresearch.org/fact-tank/2019/02/20/the-way-u-s-teens-spend-their-time-is-changing-but-differences-between-boys-and-girls-persist/

- Declines and increases in student enrollment can have a fiscal impact on libraries through changes in FTE pricing and available funds from tuition and other enrollment-based sources.
- Technology-focused students could increase the remote use of library databases and services. Or it might make students less likely to contact librarians for assistance. There will surely be challenges for library awareness, marketing, and outreach.
- Cross-campus concerns about Generation Z isolation and technology dependence could create partnership opportunities for libraries that offer co-curricular programing.

Faculty Demographics

Previous ACRL Environmental Scans in 2015 and in 2017 focused on what faculty wanted from libraries, how they wanted that information delivered, and their point of view on open access and information literacy. As faculty demographics change over time, so might habits and preferences that relate to research, teaching, and use of library resources.

According to the National Center for Education Statistics (NCES) data from 2016, the composition of higher education faculty remains predominantly White and male. Of all full-time faculty in post-secondary education, 76% were White and 41% were White males.[14]

Most NCES statistic about faculty focus on full-time faculty and within this group diversity has increased slightly. Between 2011 and 2015 the percent of faculty who are Black, Hispanic, Asian, Pacific Islander, Native American, or two or more races has increased from 20.7% to 22.5%. The percentage of men versus women has evened out from 33.2% women in 1987 to 49.1% in 2015. The gains in equal employment (in numbers, if not in salaries) for women have progressed much more than for other under-represented populations. The lack of retirements in full-time faculty are leaving few spaces for a change to occur where faculty will reflect the overall demographics of the country or even of the students on campus.[15]

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[14] U.S. Institute of Education Sciences. National Center for Educational Statistics, *The Condition of Education: Characteristics of Postsecondary Faculty* (2018), https://nces.ed.gov/programs/coe/indicator_csc.asp.

[15] *Digest of Educational Statistics. Table 315.20 Full-Time Faculaty in Degree-Granting Postpostsecondary Institutions, by Race/Ethnicity, Sex, and Academic Rank: Fall 2011, Fall 2013, and Fall 2015* (2016), https://nces.ed.gov/programs/digest/d16/tables/dt16_315.20.asp.

There were predictions of mass retirements as members of the baby boomer generation were eligible for retirement.[16] However, from 1987-2013 the percentage of full-time faculty over 65 doubled while the percentage of faculty under thirty-five decreased.[17]

In 1987, 11% of the faculty were under thirty-five with only 4% of faculty aged sixty-four or older. (TIAA). By 2017, a survey from the Higher Education Research Institute at UCLA found that 16% of faculty were over age sixty-four and only 5% were thirty-five years of age or younger. There are also fewer faculty in the 35-64 age group than in prior years.[18] Overall faculty are not retiring as early, rates of hiring new full-time faculty have slowed, and there is more reliance on part-time faculty (who are not included in this dataset). Librarians who were waiting for an influx of new full-time faculty to start promoting Open Access, changes in scholarly communications, OERs, etc. may want to rethink their strategies and focus on the growing number of non-tenure track or contingent faculty or find ways to connect with faculty who already have years invested in higher education.

Other data from NCES shows a trend in the increase in the number of part-time hires. Since the 1970s the number of full time faculty has increased, but the percentage of full-time faculty to part-time faculty has decreased from 77.8% in 1970 to 52% in 2015.[19] This reliance on part-time faculty creates challenges in library outreach as campuses may not make part-time hires as well known and may not include them on departmental and campus committees where librarians are likely to meet faculty in their departments.

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[16] Kristin Betts, David Urias, and Keith Betts, "Higher Education and Shifting U.S. Demographics:Need for Visible Administrative Career Paths, Professional Development, Succession Planning & Commitment to Diversity," *Academic Leadership: The Online Journal* 7, no. 2 (2009), https://scholars.fhsu.edu/cgi/viewcontent.cgi?article=1284&context=alj.; Denise K. Magner, "The Imminent Surge in Retirements: Colleges Face a Generational Shift as Professor Hired for the Baby Boom Enter Their 60's," *The Chronicle of Higher Education* 57f, no. 28 (2000).

[17] TIAA Institute, "The Changing Academic Workforce: Composition of the Faculty," 2018, https://www.tiaainstitute.org/sites/default/files/presentations/2018-11/TIAA_Changing_Academic_Workforce%20R1r.%2010-30-18.%20FINAL.pdf.

[18] Ellen Bara Stolzenberg et al., *Undergraduate Teaching Faculty: The Heri Faculty Survey 2016-2017* (Higher Education Research Institute, University of California, Los Angeles, 2019), https://www.heri.ucla.edu/monographs/HERI-FAC2017-monograph.pdf.

[19] U.S. Institute of Education Sciences. National Center for Educational Statistics, *Digest of Educational Statistics. Table 315.10. Number of Faculty in Degree-Granting Postsecondary Institutions, by Employment Status, Sex, Control, and Level of Institution: Selected Years, Fall 1970 through Fall 2015* (2016), https://nces.ed.gov/programs/digest/d16/tables/dt16_315.10.asp.

Implications

- Academic libraries have the opportunity to lead the way in increasing faculty and staff diversity through hiring and retaining diverse populations.
- Campus initiatives for faculty and staff diversity can provide resources and frameworks for library hiring.
- Even though faculty retirements have not happened on the schedule predicted ten years ago, these retirements are still on the viewable horizon. Libraries should plan outreach and initiatives with both an eye to current faculty and prepare for the eventuality of many upcoming retirements in their faculty and staff.

Student Learning Environment

Collections and Spaces

Academic librarians continue to adapt new technologies, services, and approaches to support student learning. Libraries face constant pressure for space as campus demands for real estate increase and libraries seek to expand the services that they house. Libraries continue to shrink on-site collections by shifting to ebooks and ejournals; deselection; or moving print materials to off-site storage all of which can make room for new services and study space.[20] While reactions to space renovations are generally positive, students and faculty can react negatively to changes in access to library collections. When library administrators for the University of Virginia sought to cut the Alderman Library's main stacks by approximately 50%, more than 500 faculty and students signed an open letter protesting the planned changes to the library.[21] The renovation plans will be presented to the Virginia General assembly in 2019 for approval.[22] It is likely that many libraries will be watching this situation evolve.

The University of Virginia example highlights the importance of engaging stakeholders when considering major library renovations and the incorporation of new services that may impact student and faculty use of collections. Librarians are developing and applying discipline-differentiated methods of book deselection in monographic-intensive areas. These methods can

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[20] William Walters, "The Death and Migration of Book Collections in Academic Libraries," *portal: Libraries the Academy* 18, no. 3 (2018), https://doi.org/10.1353/pla.2018.0025.

[21] Megan Zahneis, "Uva Library's Plan to Cut Stacks by Half Sparks Faculty Concerns," *The Chronicle of Higher Education* (2018), https://www.chronicle.com/article/UVa-Library-s-Plan-to-Cut/243610.

[22] Nik Popli, "Board of Visitors Buildings and Grounds Committee Finalizes the Designs for the Alderman Library Renovation," *Cavealier Daily* (2018), http://www.cavalierdaily.com/article/2018/09/alderman-library-renovation-design-plans-receive-board-of-visitors-approval.

assist librarians in offering high-quality collections for students and faculty in the humanities.[23] In addition to staying abreast of technological advancements, libraries must also consider recent studies showing that students favor print sources for certain types of research. Baron, et. al conducted an international study that found that four out of five students prefer print over digital reading.[24] Another study that considered the various demographics of readers (i.e. socioeconomic, school system, culture, etc.) found that out of more than 10,000 tertiary students surveyed worldwide, print was the material of preference based on ability to retain information and focus as well as other reasons.[25] Maintaining a variety of formats to meet student and faculty needs will likely continue to be required to support curriculum and research.

Makerspaces continue to be a popular addition to academic libraries. One recent study has researched four-year college libraries and maker labs, or innovation spaces, to understand their goals and benefits for student learning.[26] Data gathered from library directors found the main reason for creating makerspaces was to "promote learning and literacy," but did not address impacts on collections and research. Challenges accompany the development of expensive new, non-traditional library services especially in terms of impact on library budget priorities and shifts in the kinds of experts needed to manage makerspaces and other new digital services.

Additionally, library administrators are considering how new configurations of library space can benefit the student learning environment. Considering space as service, the literature cues librarians to be mindful of student demographics and varying learning styles, as well as the need to coordinate with the faculty of the university who also have a stake in how student environments and technological services are developed.[27] The 2015 Ithaka Faculty Survey found that faculty are increasingly concerned with students' information skills since the 2012 survey and place more importance on libraries' roles as an information gateway, archive, buyer, and

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[23] Alex D. McAllister and Allan Scherlen, "Weeding with Wisdom: Tuning Deselection of Print Monographs in Book-Reliant Disciplines," *Collection Management* 42, no. 2 (2017), https://doi.org/10.1080/01462679.2017.1299657.

[24] Naomi S. Baron, Rachelle M. Calixte, and Mazneen Havewala, "The Persistence of Print among University Students: An Exploratory Study," *Telematics and Informatics* 34, no. 5 (2017), https://doi.org/10.1016/j.tele.2016.11.008.

[25] Diane Mizrachi et al., "Academic Reading Format Preferences and Behaviors among University Students Worldwide: A Comparative Survey Analysis," *PLOS ONE* 13, no. 5 (2018). https://doi.org/10.1371/journal.pone.0197444.

[26] Ann Marie Lynn Davis, "Current Trends and Goals in the Development of Makerspaces at New England College and Research Libraries," *Information Technology & Libraries* 37, no. 2 (2018), https://doi.org/10.6017/ital.v37i2.9825.

[27] Mary Ellen Spencer and Sarah Barbara Watstein, "Academic Library Spaces: Advancing Student Success and Helping Students Thrive," *portal: Libraries and the Academy* 17, no. 2 (2017), https://doi.org/10.1353/pla.2017.0024.

support for research, teaching, and undergraduates.[28] Faculty views and support are in important factor when balancing new services with the traditional functions.

Information Literacy Instruction

Librarians continue to partner with campus constituents and to be responsive to curricular developments and new pedagogical approaches on campus. Some examples include outreach and instruction to first-year programs, incorporating different learning theories such as active learning, and experimenting with instructional techniques including service learning.[29] Since the 2015 ACRL Framework for Information Literacy for Higher Education was introduced, librarians have been working to integrate the threshold concepts into practice. A search in the database Library Literature and Information Science returns over 40 articles published since 2017 touching on the topic of information literacy and the ACRL Framework. The sheer number of publications on this demonstrates librarians' commitment to evolving the discussion of information literacy and sharing their findings with the profession at large. Some examples include practical techniques for incorporating the Framework in a meaningful way,[30] interpretations for music[31] and nursing disciplines,[32] promoting curiosity in science,[33] the use of metaphor as a tool to reflect on teaching and learning,[34] utilizing reference sources,[35] and

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[28] Carl Straumsheim, "College Libraries, Redirected," *Inside Higher Ed* (2017), https://www.insidehighered.com/news/2017/04/03/study-library-directors-moving-ahead-plans-rethink-libraries.

[29] Blodgett, "Chapter 4 - Taking the Class out of the Classroom."

[30] Dave Harmeyer and Janice J. Baskin, *Implementing the Information Literacy Framework: A Practical Guide for Librarians*, Practical Guides for Librarians (New York: Rowman and Littlefield, 2018).

[31] Erin Conor, "Reframing the Framework: Situated Information Literacy in the Music Classroom," *Fontes Artis Musicae* 64, no. 4 (2017), https://muse.jhu.edu/article/680344/summary.

[32] Gloria Willson and Katelyn Angell, "Mapping the Association of College and Research Libraries Information Literacy Framework and Nursing Professional Standards onto an Assessment Rubric," *Journal of the Medical Library Association* 105, no. 2 (2017), https://doi.org/10.5195/jmla.2017.39.

[33] Siu Hong Yu, "Just Curious: How Can Academic Libraries Incite Curiosity to Promote Science Literacy?," *Partnership: The Canadian Journal of Library & Information Practice & Research* 12, no. 1 (2017), https://doi.org/10.21083/partnership.v12i1.3954.

[34] Wendy Holliday, "Frame Works: Using Metaphor in Theory and Practice in Information Literacy," *Communications in Information Literacy* 11, no. 1 (2017), https://doi.org/10.15760/comminfolit.2017.11.1.44.

[35] Kristin E. C. Green, "Dust Off Those Encyclopedias: Using Reference Sources to Teach the ACRL Framework Concepts," *Internet Reference Services Quarterly* 22, no. 2/3 (2017), https://doi.org/10.1080/10875301.2017.1381213.

incorporating social justice values into information literacy.[36] Articles also investigate potential limitations of the Framework, such as lack of language related to metacognition[37] and the acceptance of traditional notions of truth and authority in the Framework.[38] Librarians also continue to consider how best to deliver and assess one-shot instruction session methodologies,[39] including incorporating active learning principles into a single session[40] and utilizing flipped classroom models to maximize active learning.[41]

Time to Degree and College Affordability

Universities are finding new ways to address the cost of higher education. Among these are accelerated programs such as fifth-year master's programs (also called 5-year master's programs, dual degree programs, and accelerated masters programs). These accelerated programs generally serve several purposes: to reduce time to degree for students seeking a master's degree, to keep master's students at the same institution where they complete their bachelor's degree, and to provide research opportunities to students earlier in their college careers. By taking selected graduate coursework during the last two years of undergraduate work, students have a quicker path to receiving the graduate degree. While a web search reveals many such 5-year master's degree programs, including from Vanderbilt University and the University of Georgia, there is a lack of scholarly research on the impact on student learning outcomes. The degree programs are offered in a variety of disciplines from the arts and English, to business and education.[42] These programs can impact the way that librarians approach teaching and learning by creating a need to

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[36] Lua Gregory and Shana Higgins, "Reorienting an Information Literacy Program toward Social Justice: Mapping the Core Values of Librarianship to the ACRL Framework," *Communications in Information Literacy* 11, no. 1 (2017), https://doi.org/10.15760/comminfolit.2017.11.1.46.

[37] Diane M. Fulkerson, Susan Andriette Ariew, and Trudi E. Jacobson, "Revisiting Metacognition and Metaliteracy in the ACRL Framework," *Communications in Information Literacy* 11, no. 1 (2017), https://doi.org/10.15760/comminfolit.2017.11.1.45.

[38] Nathan Aaron Rinne, "The New Framework: A Truth-Less Construction Just Waiting to Be Scrapped?," *Reference Services Review* 45, no. 1 (2017), https://doi.org/10.1108/RSR-06-2016-0039.

[39] Jacalyn E. Bryan, Darla Asher, and Elana D. Karshmer, "Assessing Librarians' Teaching of One-Shot Sessions: A New Model for Evaluating Instructional Performance," *College & Undergraduate Libraries* 25, no. 4 (2018), https://doi.org/10.1080/10691316.2018.1527268.

[40] David A. Hurley and Robin Potter, "Teaching with the Framework: A Cephalonian Approach," *Reference Services Review* 45, no. 1 (2017), https://doi.org/10.1108/RSR-07-2016-0044.

[41] Ladislava Khailova, "Flipping Library Information Literacy Sessions to Maximize Student Active Learning," *Reference & User Services Quarterly* 56, no. 3 (2017), https://doi.org/10.5860/rusq.56n3.150.

[42] Hilary Flanagan, "What Is a Fifth Year Master's Degree Program?," www.gradschools.com, updated 2014/10/17, 2014, https://www.gradschools.com/get-informed/before-you-apply/choosing-graduate-program/what-fifth-year-masters-degree-program.

address more advanced research skills at an earlier point in the undergraduate career and in classrooms that may contain a mix of graduate and undergraduate students. These accelerated programs also offer an area of potential research for educators and librarians.

Industrious students have been able to complete a college degree in less than four years, but some colleges and universities are now formally designing three-year bachelor's degree options. According to the Progressive Policy Institute, there are 32 schools that offer a three-year degree option.[43] This is a small number compared to the nearly 2000 colleges and universities that offer Bachelor's degrees. Generally these programs are offered in selected majors and not across all of the university or college programs. Some schools implementing these programs include the University of Massachusetts, Amherst and American University. Accelerated programs could have an impact on number of elective courses, study-abroad, and perhaps on the amount of time that students, and faculty, believe that they have to focus on skills such as critical thinking and information literacy that might be seen as falling outside of the required content of the major. If more universities and colleges opt to design three-year degrees, libraries should pay attention to the curriculum plans and work on the best ways to support these programs and students.

While the efficacy of open educational resources has been firmly established,[44] the libraries' role in their adoption and creation continues to evolve. *OER: A Field Guide for Academic Librarians* explores these evolving roles through a series of case studies on librarian support for adoption of OER in a variety of institutional contexts.[45] Common themes include strategies for local advocacy work, small grant-supported adoption initiatives, and strategies for finding and evaluating quality OER. This topic was covered more extensively in the 2018 ACRL Top Trends including example OER programs.[46] The Community College Consortium for Open Educational Resources (CCCOER) maintains a robust community of practice online that includes webinars, news, and case studies that will be of interest to academic librarians within and outside of community colleges.[47] The CCCOER is part of the Open Education Consortium which maintains

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[43] Paul Weinstein Jr., "Which Colleges Offer Three-Year Bachelor's and Why Aren't They Working?," Progressive Policy Institute, updated May 2018, 2018, https://www.progressivepolicy.org/wp-content/uploads/2018/05/PPI_ThreeYearDegrees2018.pdf.

[44] John Hilton, "Open Educational Resources and College Textbook Choices: A Review of Research on Efficacy and Perceptions," *Educational Technology Research Development* 64, no. 4 (2016), https://doi.org/10.1007/s11423-016-9434-9.

[45] Andrew Wesolek, Jonathan Lashley, and Anne Langley, *OER: A Field Guide for Academic Librarians* (Pacific University Press, 2018), https://commons.pacificu.edu/pup/3/.

[46] ACRL Research Planning and Review Committee, "2018 Top Trends in Academic Libraries: A Review of the Trends and Issues Affecting Academic Libraries in Higher Education."

[47] Community College Consortium for Open Educational Resources, "Community of Practice for Open Education," https://www.cccoer.org/.

a globally-focused gateway of resources.[48] OERs and other affordable learning initiatives remain a focus for campuses as a way to reduce textbook costs and lower the overall cost of the college degree. Locally this is an area for librarians to engage with their faculty to provide support for OER development and use of e-reserve articles and book chapters in lieu of textbooks that students must each purchase.

The potential of OER expands beyond replacing traditional textbooks with their free equivalents and toward open pedagogical practices.[49] Connecting students and researchers with existing resources, whether openly available or otherwise, is within the traditional role of librarians. As teaching faculty begin to adopt open pedagogy, defined broadly as student-centered practices that rely on the open availability of educational resources, the role of the librarian may expand beyond locating and evaluating resources. Indeed, the open pedagogy space is rife with teaching opportunities focused on copyright and communication of student-produced works, description and preservation of digitally born and multimodal works, and other areas librarians are well positioned to support.

Student Success Data

Colleges and universities are working to improve student retention and services through analyzing big data. Because many higher education institutions gather data from student coursework and other types of engagement, there is an opportunity to use this information to benefit students.[50] One ambitious example of using libraries using student data is The Greater Western Library Alliance study that used student data from multiple institutions to assess the impact of information literacy instruction on student learning.[51] Some have expressed concerns that colleges and universities must remain transparent about how the information is gathered and used. It will be important to see additional research gathered in the area of big data and the student learning environment as well as how those developments affect library collections and services as we move forward.

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[48] Open Educational Consortium, "Open Education Consortium: The Global Network for Open Education," (https://www.oeconsortium.org/.

[49] David Wiley and John Levi Hilton III, "Defining OER-Enabled Pedagogy," *The International Review of Research in Open Distributed Learning* 19, no. 4 (2018), https://doi.org/10.19173/irrodl.v19i4.3601.

[50] Goldie Blumenstyk, "Big Data Is Getting Bigger. So Are the Privacy and Ethical Questions," *The Chronicle of Higher Education* (2018), https://www.chronicle.com/article/Big-Data-Is-Getting-Bigger-So/244099.

[51] Joni Blake et al., "The Impact of Information Literacy Instruction on Student Success: A Multi-Institutional Investigation and Analysis," (2017), https://scholar.smu.edu/libraries_cul_research/13/.

Implications

- To meet the challenges of allocating space for both collections and services, libraries need to consider published research studies, local data, and engage their communities.

- Evolving pedagogical and curricular needs may be a key factor in determining where to innovate in space use and design as informing the design and delivery of information literacy instruction.

- The costs of higher education has garnered national attention and colleges and universities are motivated to find creative solutions such as 3-year Bachelor's degrees, 5-year master's programs, and OERs and other alternatives to textbooks. These changes can create both challenges and points of connection between librarians and faculty.

- Increasing attention to student data and retention from campus administration requires that libraries foster connections with all academic support services to remain positioned to support student success.

Equity, Diversity, and Inclusion

For several decades, institutions of higher learning and professional organizations, including the American Library Association and the Association of Research Libraries,[52] have recognized and launched initiatives in the areas of equity, diversity, and inclusion (EDI). As concepts, equity ensures equitable opportunities for historically underrepresented populations in accessing educational and employment opportunities; diversity embraces the distinctiveness of each individual and recognizes and values differences in external and internal attributes; and inclusion seeks to foster an inclusive work or education environment where all individuals are valued for their unique skills, experiences, and perspectives.[53] Events at recent ALA meetings confirm that statements and codes of conduct are a beginning rather than an end point and that across librarianship – in our professional organizations and our workplaces – there is still much more to

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[52] Office for Diversity Literacy American Library Association and Services Outreach, "Equity, Diversity, and Inclusion Recommendations Report Ii," updated 2018/01/30/, 2018, http://www.ala.org/aboutala/sites/ala.org.aboutala/files/content/diversity/EBD_5.8_EDI%20Recommendations%20Report_MW2018_Final.pdf.; Association of College and Research Libraries, "ACRL Diversity Alliance," http://www.ala.org/acrl/issues/diversityalliance.; "ACRL Plan for Excellence: Core Commitment," http://www.ala.org/acrl/aboutacrl/strategicplan/stratplan.

[53] American Library Association Office for Diversity, Literacy, and Outreach Services. "ODLOS Glossary of Terms." http://www.ala.org/aboutala/odlos-glossary-terms.

be done to create an equitable, diverse, and inclusive environment for ourselves and for our library users.[54]

A 2017 Ithaka survey asked higher education experts about diversity in higher education. Respondents identified the Supreme Court ruling *Fisher v. University of Texas* which upheld affirmative action in admissions as the "most positive high-impact event on the list." This same survey found that 71% of respondents viewed student protests surrounding high-profile controversial speakers as having a negative impact. Ithaka notes that "in their open-ended comments, respondents cited the importance of protecting free speech on campuses, as well as the educational and social costs of suppressing dialogue and diversity of opinion on controversial issues."[55] Campuses are trying different approaches to providing a safe and respectful environment that supports the open exchange of ideas and a more diverse community for students. Racial tension on campuses can lead to a recommitment by college administrators to make diversity-hiring, cultural competency trainings, and curricular changes a priority in order to address racial issues.[56] University policies may also be informed by social network analysis of the interactions of a diverse student body.[57] Administrators may be susceptible to "diversity fatigue" and minority faculty members may feel burdened by the expectation of participating in campus EDI and cultural competency efforts, while simultaneously forced to navigate resistance to such work when they do engage.[58] Looking forward, the Association of American Colleges & Universities conference in 2019 will concentrate on "engaged inclusivity" which aims to "examine what it means to work toward a campus environment where inclusivity thrives through constant reflection, analysis, and accountability."[59] A lack of diversity in certain academic disciplines has led to some inquiries into the effects of building diversity and inclusion into the

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[54] Lindsay McKenzie, "Racism and the American Library Association," *Inside Higher Ed* (2019), https://www.insidehighered.com/news/2019/02/01/american-library-association-criticized-response-racism-complaint.

[55] Rayane Alamuddin, Martin Kurzweil, and Daniel Rossman, "Higher Ed Insights: Results of the Spring 2017 Survey," Ithaka S+R, http://www.sr.ithaka.org/publications/higher-ed-insights-results-of-the-spring-2017-survey/.

[56] Alexander C. Kafka, "This College Is on the Front Lines of America's Divides. Here's How It's Working to Bridge Them," *The Chronicle of Higher Education* (2018), https://www.chronicle.com/article/This-College-Is-on-the-Front/244461.

[57] Faezeh Karimi and Petr Matous, "Mapping Diversity and Inclusion in Student Societies: A Social Network Perspective," *Computers in Human Behavior* 88 (2018), https://doi.org/10.1016/j.chb.2018.07.001.

[58] Mariam B. Lam, "Diversity Fatigue Is Real," *The Chronicle of Higher Education* (2018), https://www.chronicle.com/article/Diversity-Fatigue-Is-Real/244564.

[59] Association of American Colleges and Universities, "2019 Diversity, Equity, and Student Success," updated 2019, 2019, https://www.aacu.org/conferences/dess/2019.

curriculum for specific programs.[60] The identification of equity and diversity gaps in general education classes and new student orientations also can be viewed as a first step in ensuring institutional support of student success for all students.[61] Several campuses nationwide are undertaking a variety of approaches at the macro-, meso-, and micro-levels, in order to advance diversity and inclusion at their institutions.[62]

The ACRL President's Program discussion series for 2018-19 will focus on EDI issues and there is general recognition that far more progress must be made.[63] Academic and research librarians are increasing efforts to raise awareness of EDI by incorporating it into their outreach programs, professional development, and graduate programs, including internationally.[64] Libraries are reviewing displays to ensure a more inclusive visual representation of science,[65] as well as using the Race Card Project to engage users with these topics and foster safe library spaces.[66] Librarians are also writing about functional diversity and factors affecting a positive workplace

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[60] Rebecca A. Atadero et al., "Building Inclusive Engineering Identities: Implications for Changing Engineering Culture," *European Journal of Engineering Education* 43, no. 3 (2018), https://doi.org/10.1080/03043797.2017.1396287.; Alison Cook-Sather, Crystal Des-Ogugua, and Melanie Bahti, "Articulating Identities and Analyzing Belonging: A Multistep Intervention That Affirms and Informs a Diversity of Students," *Teaching in Higher Education* 23, no. 3 (2018), https://doi.org/10.1080/13562517.2017.1391201.; Hironao Okahana et al., "STEM Doctoral Completion of Underrepresented Minority Students: Challenges and Opportunities for Improving Participation in the Doctoral Workforce," *Innovative Higher Education* 43, no. 4 (2018), https://doi.org/10.1007/s10755-018-9425-3.

[61] Ed Klonoski, Gregory Barker, and Vernese Edghill-Walden, "General Education: The Front Lines of Equity and Inclusion at a Midsize Public University," *The Journal of General Education* 66, no. 1 (2017), https://doi.org/10.5325/jgeneeduc.66.1-2.0060.

[62] Kathy Takayama, Matthew Kaplan, and Alison Cook-Sather, "Advancing Diversity and Inclusion through Strategic Multilevel Leadership," *Liberal Education* 103, no. 3/4 (2017), https://www.aacu.org/liberaleducation/2017/summer-fall/takayama_kaplan_cook-sather.

[63] Lauren Pressley, "Introducing the ACRL President's Program EDI Discussion Series," *ACRL Insider* (2018), https://www.acrl.ala.org/acrlinsider/archives/16629.

[64] Andrew R. Grissom, "The Alert Collector: Workplace Diversity and Inclusion," *Reference & User Services Quarterly* 57, no. 4 (2018), https://doi.org/10.5860/rusq.57.4.6700.; Roselle S. Maestro et al., "Teaching Diversity, Becoming Inclusive: Perspectives and Possibilities in ASEAN Library and Information Science Schools," *Journal of the Australian Library & Information Association* 67, no. 2 (2018), https://doi.org/10.1080/24750158.2018.1467142.

[65] Mae Evans, Irene M. H. Herold, and Zachary Sharrow, "Hidden Science Superstars: Making Diversity Visible to Increase Inclusion," *College & Research Libraries News* 79, no. 7/8 (2018), https://doi.org/10.5860/crln.79.7.380.

[66] Stephanie Everett, "Visualizing the Silent Dialogue About Race: Diversity Outreach in an Academic Library," *Journal of Academic Librarianship* 44, no. 4 (2018), https://doi.org/10.1016/j.acalib.2018.04.002.

experience for those with disabilities.[67] Diversity residency programs are an area that has great potential, according to Pickens and Coren, who provide a set of recommendations for institutions looking to start a program or to review an existing one.[68] As this conversation expands, even the Open Access (OA) movement has come under scrutiny in an attempt to ensure that scholarly communication initiatives seek out social justice and the "missing voices" in order to pursue a truly equitable, global exchange of ideas.[69]

Implications

- Create and foster academic library workplaces in which staff with diverse backgrounds and perspectives can succeed, without expecting all EDI work to be done by employees in under-represented groups.

- Advance outreach activities and supplement instruction with classroom practices and examples that promote inclusion and diversity of thought.

- Library administrators need to seek out and provide for faculty and staff development opportunities which promote intercultural awareness and competencies.

- Libraries are part of broader communities that may provide training and resources to support EDI, such as campuses, local governments, and professional organizations. Local communities can also provide libraries with valuable insight for program development and inclusive instructional design.

Library Neutrality and Free Speech on Campus

The concept of neutrality in libraries, and in particular the idea that librarians should aspire to provide equal access to materials of all viewpoints and treat all users' inquiries as the same regardless of the intolerance that may be expressed, has been debated for quite some time.

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[67] J. J. Pionke, "Functional Diversity Literacy," *Reference Services Review* 46, no. 2 (2018), https://doi.org/10.1108/RSR-02-2018-0024.; Joanne Oud, "Academic Librarians with Disabilities: Job Perceptions and Factors Influencing Positive Workplace Experiences," *Partnership : the Canadian Journal of Library and Information Practice and Research; Toronto* 13, no. 1 (2018), https://doi.org/10.21083/partnership.v13i1.4090.

[68] Chanelle Pickens and Ashleigh D. Coren, "Diversity Residency Programs: Strategies for a Collaborative Approach to Development," *Collaborative Librarianship* 9, no. 2 (2017), https://digitalcommons.du.edu/collaborativelibrarianship/vol9/iss2/7.

[69] Michelle Baildon, "Extending the Social Justice Mindset: Implications for Scholarly Communication," *College & Research Libraries News* 79, no. 4 (2018), https://doi.org/10.5860/crln.79.4.176.

Commentators from various positions have considered the topic since the 1960s.[70] However, the debate regarding neutrality as a library value has reemerged in professional discussions with a new urgency, due in part to the current polarized U.S. political climate and the pronounced visibility and reemergence of hate groups. Questions of whether neutrality is an essential value for maintaining intellectual freedom, as well as the impossibility of neutrality being an option that one can "choose" when every decision is political in some way, were considered at the 2018 ALA Midwinter President's Program.[71]

In June 2018 at the ALA annual conference, the ALA Council voted to approve an update to the guidelines "Meeting Rooms: An Interpretation of the Library Bill of Rights" with provisional language. After this initial approval but seemingly without the full knowledge of councilors, the draft guidelines were edited to name "hate groups" as an example of people who could not be excluded from library meeting rooms. News of the updated language later reached members of the profession, many of whom expressed outrage at the decision on social media. A petition created by We Here, a community of people of color in the libraries and archives fields, was signed by hundreds in a matter of days.[72] Librarians petitioned councilors to hold another vote on rescinding the language, which passed.[73] Based on these events it is clear that the profession feels strongly about the issue of neutrality, which has very real effects on library collections, space, and the users we serve.

The library neutrality debate is in some ways reflected in the arguments surrounding the battles concerning free speech on higher education campuses. Free speech in higher education has figured largely in news outlets as a debate on whether alt-right speakers seeking a platform should be allowed to speak on campuses, but more consequential questions are raised in terms of

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[70] David K. Berninghausen, "Antithesis in Librarianship: Social Responsibility vs. The Library Bill of Rights," *Library Journal*, no. 97 (1972).; D. J. Foskett, *The Creed of a Librarian – No Politics, No Religion, No Morals* (London: The Library Association, 1962).; *Questioning Library Neutrality: Essays from Progressive Librarian* (Library Juice Press, 2008).; Toni Samek, *Intellectual Freedom and Social Responsibility in American Librarianship, 1967-1974* (Jefferson: McFarland, 2001).; Celeste West, "Secret Garden of Censorship: Ourselves," *Library Journal*, no. 108 (1983).

[71] Em Claire Knowles et al., "ALA President's Program: Are Libraries Neutral? Have They Ever Been? Should They Be?," in *ALA Midwinter 2018, American Library Association* (Seattle2018), https://2018.alamidwinter.org/speaker/ala-presidents-program.

[72] "Petition to Revise Ala's Statement on Hate Speech & Hate Crime," 2018/07/13/ 2018, https://docs.google.com/document/d/1WxaRj0i63OHKcOG4F55PpKQ4kz7a-Iv4CELfzlqyFKU.

[73] "ALA Council Rescinds Meeting Rooms: An Interpretation of the Library Bill of Rights," news release, 2018/08/16, www.ala.org/news/press-releases/2018/08/ala-council-rescinds-meeting-rooms-interpretation-library-bill-rights.

student and faculty speech.[74] An analysis of data in March 2018 by the director of Georgetown University's Free Speech Project found that the free speech "crisis" is overblown, and that the same few prominent conservative speakers use these opportunities to promote themselves and claim they are being targeted. Much less publicized but more common, according to the data, is when professors or students of color are not allowed to express themselves.[75] Discussions of free speech in higher education are often reduced to a false dichotomy, where diversity and inclusion are believed to be at odds with free expression.

Academic libraries have found themselves involved in controversial campus issues, as with the debate surrounding the "Silent Sam" statue at University of North Carolina Chapel Hill. A statue of a Confederate soldier, seen as a monument to white supremacy, was toppled by protestors in summer 2018, and the university has since considered various proposals for keeping the statue on campus or removing it altogether. To prevent the university libraries from being considered as a potential site for displaying the statue, nearly half of the UNC Libraries staff signed a statement in opposition to such action, along with a letter from the Administrative Board of the Library.[76] This swift and decisive action appears to have prevented the libraries from being considered as a site for the statue. As the issue of free speech progresses on campuses and across the higher education landscape, academic libraries may find themselves increasingly part of these debates.

Implications

- Academic libraries must consider their positions on meeting spaces, acquisitions, and other reflections of the library's orientation, and make these policies explicit.
- Academic library leaders and staff should be prepared if and when their libraries are put at the forefront of a debate regarding free speech on campus.

Scholarly Communication Landscape

Open Access

In the continually evolving arena of Open Access, recent data highlight the differing approaches between scholars and institutions in European countries and the United States. According to the

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[74] Katy Steinmetz, "Milo Yiannopoulos Spoke at Berkeley. Protesters Were Louder," *Time* (2017), www.time.com/4955245/milo-yiannopoulos-berkeley-free-speech-week/.

[75] Chris Quintana, "The Real Free-Speech Crisis Is Professors Being Disciplined for Liberal Views, a Scholar Finds," *The Chronicle of Higher Education* (2018), www.chronicle.com/article/The-Real-Free-Speech-Crisis-Is/243284.

[76] Evely Forte, "Almost Half of Unc Libraries Staff Signed Statement against Silent Sam Being Placed in Any Branch," *The Daily Tar Heel* (2018), https://www.dailytarheel.com/article/2018/10/unc-libraries-silent-sam.

data on open access publications from European Commission, the percentage of green open access in European Union (EU) countries ranges from 11.2% (Lithuania) to 28.1% (Belgium) and the percentage of gold open access ranges from 7.4% (France) to 20.2% (Latvia). While in US, green open access is 29.1% (higher than the EU country with the highest percentage of green OA) and gold open access is 7.0%.[77] (lower than the EU country with lowest percentage of gold OA). Compared to EU countries, the U.S. favors the green model that is more publisher-friendly and relies on authors providing free access via deposit in an open access repository rather than freely available at the journal's website. The number of institutions adopting institutional open access policy is increasing year by year. According to the website of the Coalition of Open Access Policy Institutions (COAPI), the number of member institutions has grown to 106 from 94 in May 2017.[78] At the U.S. Federal level, the development of green open access policies has been moving slowly since 2013, when the introduction of the Fair Access to Science and Technology Research Act (FASTR) was made and accompanied an Office of Science and Technology Policy (OSTP) directives.[79]

On the other hand, Europe has made a bold move in the gold open access development in 2018, following the OA2020 initiative. COAlition-S, a group of European national research funding organizations, with the support of the European Commission and the European Research Council, launched Plan S in September 2018, as a set of principles targeting 2020 as the deadline of all research funded by participating national and European research councils and funding bodies to be published in "compliant open access journals or on compliant Open Access Platforms."[80] The Plan S is indeed an ambitious proposition and has led to a vigorous debate across sections, including both support and concern, sometimes both.[81] On November 22, 2018, the Guidance on the Implementation of Plan S was released and is now open for public feedback.[82] There is still time, until January 1, 2020, to have the conversation and discussion

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[77] European Commission, "Trends for Open Access to Publications," https://ec.europa.eu/info/research-and-innovation/strategy/goals-research-and-innovation-policy/open-science/open-science-monitor/trends-open-access-publications_en.

[78] SPARC, "Coalition of Open Access Policy Institutions (Coapi)," SPARC, https://sparcopen.org/coapi/.

[79] Roy Kaufman, "Recent Developments in Us Federal Open Access Policies: FASTR Moves Slower," Copyright Clearance Center, 2017, http://www.copyright.com/blog/us-federal-open-access-policies-fastr/.

[80] "'Plan S' and 'Coalition S' – Accelerating the Transition to Full and Immediate Open Access to Scientific Publications," https://www.coalition-s.org/.

[81] Office of Scholarly Communication Univesrity of Cambridge, "Plan S | Unlocking Research | Page 2," 2018, https://unlockingresearch-blog.lib.cam.ac.uk/?p=2163.

[82] Science Europe, "Feedback on the Implementation Guidance of Plan S Generates Large Public Response," news release, 2019, https://www.coalition-s.org/feedback/.

among researchers, librarians, publishers, funders and scientific societies on the actual implementation.

As the field of scholarly communication librarianship matures, it continues to expand beyond open access and into the areas of Open Data. In the Open Data Space, Wikidata and Wikibase are proving promising pathways toward linked data environments which may improve library discovery systems, as well as providing better understanding of how scholarship is communicated and evaluated. ARL recently developed a task force to explore partnerships with the Wikimedia Foundation, which released a draft white paper for public comment in fall 2018.[83] Notable recommendations include using Wikidata as a repository for open linked data, encouraging staff to edit and contribute to Wikidata, and expand the capacity of Wikipedians-in-Residence.

Implications

- Libraries should have a good understanding of Plan S and its implementation details, determine if there will be potential implication to researchers within the institution, and provide feedback to COAlition-S if necessary.
- Plan S provides libraries with an opportunity to lead discussions on what this means for the international research and publishing landscape and inform their researchers and campus leadership about Open Access issues.
- As OA mandates and initiatives grow, libraries can establish themselves as the campus experts in authorship rights and open access requirements. By partnering with campus stakeholders to develop institutional an open access policy, libraries can raise awareness and help their researchers retain rights to their scholarly works.
- Open Data, in particular open linked data, has potential to improve library discovery systems.

Big Deal Cancellations

Once seen as a cost saving opportunity, many libraries now believe the "Big Deal" packages which bundle together a wide swath of a publisher's journals into one contract locks them into unsustainable price increases and may include paying for packaged content that is of low relevance or quality. As such, many are now weighing the potential costs and opportunities in cancelling their Big Deal subscriptions.

SPARC has been tracking Big Deal cancellations since 2009, but momentum in this space grew in 2018. At the time of this writing, seven institutions and eight consortia/institutes cancelled

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[83] Association of Research Libraries, "ARL Wikidata Task Force White Paper (Draft for Public Comment)," ARL, updated 2018/11//, 2018,
https://docs.google.com/document/d/1ZsOyw2sOD3a7xJQ6XCSYDGjZUPxGGl8tuvC7vvtlJRU/edit.

their Big Deal subscriptions in 2018/2019.[84] Florida State University cancelled its Big Deal subscription with Elsevier, retaining instead subscriptions to a much smaller core of essential journals, while bolstering their ILL capacity.[85] After months of negotiations surrounding the 5 year Big Deal contract between Elsevier and the University of California system, the latter has terminated its subscriptions with the former.[86] At the time of this writing, UC's actions represent a substantial acceleration of Big Deal cancellation trends. The UC system is responsible for 10% of the research output of the United States and Elsevier is the world's largest publisher of scholarly journals.[87] As such the cancelled contract is sure to have profound, if yet unknown, implications for the scholarly communications ecosystem. Without paid access to Elsevier content, the UC system is encouraging its community to find alternative and increasingly open access to Elsevier articles.[88]

Implications

- It is unclear what impact Big Deal cancelations such as the UC System and University of Florida will have on publishers and how this might affect future business models and pricing. Libraries will need to remain alert to changes in the marketplace.
- The experiences of UC, Florida, and others can inform libraries that are considering cancelling a Big Deal package in terms of impact on campus, communications with researchers, library workloads, and ILL costs.

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[84] SPARC, "Big Deal Cancellation Tracking," 2019, https://sparcopen.org/our-work/big-deal-cancellation-tracking/ (Continuously updated dataset of Big Deal cancellations. Accessed for this publication March 25, 2019.).

[85] "Big Deal Cancellation Tracking."

[86] Lindsay McKenzie, "Heavyweight Showdown over Research Access," *Inside Higher Ed* (2018), https://www.insidehighered.com/news/2018/12/13/university-california-challenges-elsevier-over-access-scholarly-research.

[87] Office of the President University of California, "UC Terminates Subscriptions with World's Largest Scientific Publisher in Push for Open Access to Publicly Funded Research," news release, February 28, 2019, 2019, https://www.universityofcalifornia.edu/press-room/uc-terminates-subscriptions-worlds-largest-scientific-publisher-push-open-access-publicly.

[88] Office of Scholarly Communication University of California, "Alternative Access to Elsevier Articles," https://osc.universityofcalifornia.edu/open-access-at-uc/publisher-negotiations/alternative-access-to-articles/.

Community-Owned Infrastructure and Institutional Repositories

On August 2, 2017, Elsevier announced its acquisition of bepress.[89] Bepress- Berkeley Electronic Press- is the most dominant product (Digital Commons) and service provider in the North America for institutional repositories. The acquisition positioned Elsevier as a major if not the foremost single player in the institutional repository landscape.[90] The acquisition sent a shockwave throughout the library community and hundreds of institutions that use Digital Commons to support their open access effort on campus woke up the news that their repository services and infrastructure were now owned by Elsevier.[91] Discussions quickly spread through the community. Heather Joseph from SPARC and Kathleen Shearer from Confederation of Open Access Repositories (COAR) wrote a blog post to help frame the organization's responses to the acquisition.[92] At the CNI meeting in December 2017 and the ALA Midwinter meeting in February 2018, SPARC convened members-only events on the topic of "community-controlled infrastructure for scholarly communication." A range of potential actions were proposed and discussed at the events. SPARC took a lead and adopted three initiatives in their program plan in 2018.[93]

- Invest in high-level market expertise to produce a strategic analysis/action plan;

- Redefining parameters for commercial arrangements;

- Revisiting our repositories (can we agree on a vision of next generation repositories that includes mechanisms to ensure they remain community controlled?)

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[89] Tom Reller, "Elsevier Acquires Bepress, a Leading Service Provider Used by Academic Institutions to Showcase Their Research," news release, 2017/08/02, https://www.elsevier.com/about/press-releases/corporate/elsevier-acquires-bepress,-a-leading-service-provider-used-by-academic-institutions-to-showcase-their-research.

[90] Roger C. Schonfeld, "Elsevier Acquires Institutional Repository Provider Bepress," *The Scholarly Kitchen*, 2017, https://scholarlykitchen.sspnet.org/2017/08/02/elsevier-acquires-bepress/.

[91] Heather Joseph, "Securing Community-Controlled Infrastructure: Sparc's Plan of Action " *College & Research Libraries News*, https://doi.org/https://doi.org/10.5860/crln.79.8.426.

[92] Heather Joseph and Kathleen Shearer, "Elsevier Acquisition Highlights the Need for Community-Based Scholarly Communication Infrastructure," *SPARC News* (2017), https://sparcopen.org/news/2017/elsevier-acquisition-highlights-the-need-for-community-based-scholarly-communication-infrastructure/.

[93] Joseph, "Securing Community-Controlled Infrastructure."

COAR also released a report on next generation repositories with the hope of providing a foundation for distributed, globally networked infrastructure for scholarly communication.[94] Other interesting initiatives that are currently underway include "Beprexit" from University of Pennsylvania and "2.5% Commitment" from David Lewis. When Elsevier announced its acquisition of bepress, Penn Libraries, a bepress customer for 13 years, made a practical, values-based decision to start exploring alternative options in a project called bepresxit ("bepress exit").[95] The project's goal was to rethink U. Penn's own scholarly communication infrastructure, the services they provide and the products that can best support community's needs. It was hoped that others can learn from their successes and failures and might be inspired to look at their own structures and make decisions about what libraries should own in scholarly communication. The 2.5% commitment initiative proposes that every academic library should commit to invest 2.5% of its total budget to support the common infrastructure needed to create the open scholarly commons.[96]

Implications

- As publishers assert power through purchase of repository platforms, libraries and consortia should proactively plan how and what they can do to retain control of content throughout the scholarly communication lifecycle.

- Libraries should consider strategic allocation of resources to support open access projects locally and as part of consortia.

Research Evaluation and Metrics

The general landscape of research metrics and evaluation has largely remained the same over the last few years. Competition among institutions for researchers, students, and funding remains

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[94] Next Generation Repositories Working Group, "Next Generation Repositories: Behaviours and Technical Recommendations of the COAR," Confederation of Open Access Repositories, 2017, https://www.coar-repositories.org/files/NGR-Final-Formatted-Report-cc.pdf.

[95] Sarah Wipperman, Shawn Martin, and Chealsye Bowley, "Balancing Influence in a Shifting Scholarly Communication Landscape: Creating Library-Owned, Community-Aligned Infrastructure through Individual, Local, and Community Action," *College & Research Libraries News* 79, no. 5 (2018), https://doi.org/10.5860/crln.79.5.244.

[96] David W. Lewis et al., "Funding Community Controlled Open Infrastructure for Scholarly Communication: The 2.5% Commitment Initiative," *College & Research Libraries News* 79, no. 3 (2018), https://doi.org/10.5860/crln.79.3.133.

fierce, particularly but not exclusively at R1 institutions,[97] as does the competition among researchers for tenure-track positions.[98] Top universities are increasingly focused on rankings and garnering more prestige. Two of the most well-known university ranking systems focus 40% of the performance indicators on research output (i.e. reputation, volume, and funding) of institutions and the research influence (i.e. citation counts) of faculty.[99] This emphasis on objective rankings has led to reliance on quantitative metrics to evaluate institutions and its researchers.[100]

Metrics aim to show the value of a researcher's output and the impact of their work. Some factors are direct measures (e.g. citation count) and others are indirect measures where the researcher inherits some prestige from the journals that they have published in (e.g. impact factors). Impact factors and acceptance rates of journals, *h*-indices of authors, and citation counts and altmetric scores of articles are just some of the many different metrics that have been created to quantify this value. However, these metrics all have their limitations.[101] New metrics have been developed to try and work around flaws in previous systems. Most of these new metrics remain solely in the realm of academic discussion, however, with the entrenched measures (e.g., Journal Impact Factor, *h*-index) remaining the most popular due to a variety of factors.[102] Altmetrics emerged in 2010 as a hot topic in research impact and remains an area of interest for librarians and scholars as it expands the types of impact considered beyond traditional bibliometrics to include factors such as mentions in social media and number of downloads. It is even becoming common to see researchers including their *h*-index and an altmetrics badge on their online profiles and publishers often include impact measure on their journals' websites and

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[97] The Carnegie Classification of Institutions of Higher Education, "Basic Classification Description," http://carnegieclassifications.iu.edu/classification_descriptions/basic.php.

[98] Marc A. Edwards and Siddhartha Roy, "Academic Research in the 21st Century: Maintaining Scientific Integrity in a Climate of Perverse Incentives and Hypercompetition," *Environmental Engineering Science* 34, no. 1 (2017), https://doi.org/10.1089/ees.2016.0223.

[99] "World University Rankings 2019: Methodology," *Times Higher Education (THE)* (2018), https://www.timeshighereducation.com/world-university-rankings/methodology-world-university-rankings-2019.

[100] Steven Braun, "Supporting Research Impact Metrics in Academic Libraries: A Case Study," *portal: Libraries and the Academy* 17, no. 1 (2017), https://doi.org/10.1353/pla.2017.0007.

[101] James Wilsdon et al., *The Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management* (2015), https://doi.org/10.13140/RG.2.1.4929.1363.

[102] Kushwanth Koya and Gobinda Chowdhury, "Metric-Based Vs Peer-Reviewed Evaluation of a Research Output: Lesson Learnt from Uk's National Research Assessment Exercise," *PLOS ONE* 12, no. 7 (2017), https://doi.org/10.1371/journal.pone.0179722.; Ludo Waltman, "A Review of the Literature on Citation Impact Indicators," *arXiv e-prints* (2015), https://ui.adsabs.harvard.edu/\#abs/2015arXiv150702099W.; Björn Hammarfelt and Alexander D. Rushforth, "Indicators as Judgment Devices: An Empirical Study of Citizen Bibliometrics in Research Evaluation," *Research Evaluation* 26, no. 3 (2017), https://doi.org/10.1093/reseval/rvx018.

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at the article level. A market for commercial tools to support research metrics, including altmetrics has emerged with companies such as Plum Analytics and Altmetrics marketing products not only to libraries but also to campus administrators and research units on campuses.

This emphasis on objective rankings is not without controversy. Most bibliometricians agree that, while quantitative metrics can be a useful indicator of prestige, they should not be the sole consideration when making decisions. In fact, the drive by institutions to improve their rankings has led to an increase in what Edwards and Roy call "perverse" academic incentives, with actual effects far removed from what is intended.[103] There is a growing movement among bibliometricians, researchers, and other members of the academic community advocating for the responsible use of metrics for research evaluation such as the San Francisco Declaration on Research Assessment[104] and the Leiden Manifesto.[105]

Research has shown that while many faculty are aware of different types of research metrics -- mostly journal impact factors and the *h*-index -- they generally lack knowledge of what the metrics mean and how to use them.[106] Libraries can and should help to fill this gap in faculty and administrator knowledge about research metrics. A good starting point for subject liaisons is gaining an understanding of which metrics are most commonly used in each discipline. Faculty in the sciences and social sciences are more likely to use (and already be moderately familiar with) traditional metrics like the Journal Impact Factor and the *h*-index. Faculty in the humanities, particularly those whose scholarship consists primarily of monographs, are far more likely to have little to no familiarity with any sort of metric, traditional or otherwise.[107]

Many tools now exist to help librarians and researchers understand the landscape. Some define the different levels and types of metrics such as the Metrics Toolkit[108] and MyRI.[109] Digital

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[103] Edwards and Roy, "Academic Research in the 21st Century."

[104] "San Francisco Declaration on Research Assessment," https://sfdora.org/read/.

[105] Diana Hicks and Pete Wouters, "Leiden Manifesto for Research Metrics," 2015, http://rutgersaaup.org/sites/default/files/images/Leiden-manifesto-research-methods-520429a.pdf and www.leidenmanifesto.org/.

[106] Mindy Thuna and Pam King, "Research Impact Metrics: A Faculty Perspective," *Partnership: The Canadian Journal of Library & Information Practice & Research* 12, no. 1 (2017), https://doi.org/10.21083/partnership.v12i1.3906.

[107] "Research Impact Metrics."; Dan DeSanto and Aaron Nichols, "Scholarly Metrics Baseline: A Survey of Faculty Knowledge, Use, and Opinion About Scholarly Metrics," *College & Research Libraries* 78, no. 2 (2017), https://doi.org/10.5860/crl.78.2.150.

[108] "Metrics Toolkit," http://www.metrics-toolkit.org/.

[109] "MyRI: Measureing Your Research Impact," http://myri.conul.ie/.

Science's Dimensions[110] and 1science's 1findr[111] are resources that provide a full context, including societal impact, for both traditional (monographs, journal articles, conference proceedings, etc.) and non-traditional (grants, patents, clinical trials, etc.) research outputs. Many librarians in subject liaison roles already help faculty to identify publishing opportunities and track their research; metrics- and research evaluation-related services can be thought of as an extension of this. Some of these services exist already across different types of colleges and universities.[112] In their literature review Vinyard and Colvin found that libraries at smaller institutions tended to focus on meeting their users at the point of need, while the bibliometric departments at larger institutional libraries were able to devote more time to creating reports for their academic divisions, contributing to the field of bibliometric research, and in some cases developing tools to help their users with collecting and analyzing metrics.[113]

Implications

- Since the limitations of research metrics are not widely understood, libraries need to work with campus administrators on appropriate use of this type of data and advocate with faculty for more inclusive and robust tenure assessments.
- Libraries should prepare for an increase in faculty questions about metrics and evaluation, and plan resources or services accordingly.

Conclusion

The breadth of the landscape that affects libraries in higher education can be daunting, but the issues impact our students, scholars and colleagues in essential ways. Changes around and within libraries may appear glacial slow or startling abrupt depending on one's perspective and level of awareness. Demographics may shift slowly until there is a tipping point of dramatic changes in institutions' programs. Pressures for different uses of spaces may build over time, until funding can be secured and then seemingly rapid decisions can catch users off guard if not well communicated. Changes in the political climate can bring new pressures to campuses and force hard discussions that have been avoided for many years. And the slow pace of diversity efforts is

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[110] Digital Science, "Dimensions," https://www.dimensions.ai/.

[111] 1science, "1findr Free Edition," https://1findr.1science.com/home.

[112] Sarah Visintini et al., "Research Support in Health Sciences Libraries: A Scoping Review," *Journal of the Canadian Health Libraries Association (JCHLA)* 39, no. 2 (2018), https://doi.org/10.29173/jchla29366.

[113] Marc Vinyard and Jaimie Beth Colvin, "How Research Becomes Impact: Librarians Helping Faculty Use Scholarly Metrics to Select Journals," *College & Undergraduate Libraries* 25, no. 2 (2018), https://doi.org/10.1080/10691316.2018.1464995.

a reminder to work harder. The developments on the OA front may seem abrupt but come after years of campaigns and hard work. It is imperative that librarians have awareness of the broader landscapes of students, higher education pedagogy and policy, publishers, and research and scholarship to enable them to participate rather than just respond.

This iteration of the bi-annual ACRL Environmental Scan highlighted changes in enrollment demographics and student characteristics that could affect issues from funding and resource allocation, to classroom pedagogy and use of technology, to the training needs of student workers. Faculty demographics are slowly becoming more racially and ethnically diverse, but the predicted wave of faculty retirements has not yet occurred. Changes in the student learning environment generate from many part of the Academy. Information literacy and Open Pedagogy seek to improve student learning outcomes. Campuses and libraries use student data to track metrics such as retention and grades to assess impact and improve student academic success and must consider the ethical use of available data. Affordability of higher education spurs campuses and libraries to consider, and partner on, affordable alternatives to textbooks including Open Educational Resources. Libraries continue to work to balance the spaces, services and collections that students and faculty need in light of changes in preferences, vendor landscapes, and budgets. Long standing social issues have taken on new urgency in a polarized political climate and as awareness of inequality and privilege increase. In turn campuses and libraries grapple with upholding and protecting free speech while providing environments that are safe and welcoming to diverse communities. Open Access reaches the twenty-year mark as movement but continues to gain momentum and attempt to counterbalance publisher expansions into IR infrastructure and price increases. Faculty and institutional research metrics proliferate and grow in importance but are not well understood by faculty and administrators which provides an area of service for librarians to increase and use their expertise. The Scan is provides a short analysis with implications to draw attention to key areas of attention and action for libraries. The footnotes provide a starting point for deeper understanding for those librarians wishing to delve more deeply into any of the many external factors that shape the Higher Education environment in which academic librarians work.

Appendix A: ACRL Research Planning and Review Committee 2018-2019

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University of Georgia

Allison Benedetti (Vice-Chair)
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UCLA Library

Ginny Boehme
Science Librarian
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Thomas Reed Caswell
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Yuan Li
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