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**Association of College & Research Libraries**
A division of the American Library Association

# 2021 Environmental Scan

ACRL Research Planning and Review Committee | April 2021

# Contents

# Introduction

Every other year, the ACRL Research Planning and Review Committee provides a scan of higher education, detailing the current environment and its anticipated impact on libraries. While this year's Environmental Scan is no different in terms of scope, we are now facing challenges to higher education on a scale not seen in decades. Across the globe, the COVID-19 pandemic has disrupted the lives and livelihoods of millions of people, and in the United States, this disruption has been compounded by the eruption of protests surrounding civil rights and other social justice issues.

While the 2021 Environmental Scan covers developments over the last two years (2019 and 2020), the events of 2020 are anticipated to have lasting repercussions, and, while not the primary focus, are a common thread throughout the document.

# COVID-19 Challenges

## Impacts of the Pandemic on Higher Education

Even after the initial wave of shutdowns in early 2020 led to major financial shocks to higher education, with tuition and housing reimbursements, furloughs, and closures of revenue-generating units such as medical services and athletics, the COVID-19 pandemic has continued to present challenges to higher education funding on multiple fronts. Enrollment has fluctuated, as many students decided not to re-enroll or opted for less expensive options for remote courses.[1] Travel restrictions raised questions about the ability of international students to complete coursework and maintain visa eligibility while enrolled in fully remote programs.[2] National, state, and local governments have navigated various waves and phases of the pandemic, leading to uncertainty about tax revenues that typically contribute to funding.

Some U.S. institutions were able to take advantage of short-term relief via the CARES Act and/or Paycheck Protection Plan programs, as well as enhanced Unemployment Insurance

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[1] Morgan Polikoff, Dan Silver, and Shira Korn, "An Analysis of Data from a National Survey on the Impact of the Pandemic on Higher Ed," Inside Higher Ed, August 4, 2020, https://www.insidehighered.com/views/2020/08/04/analysis-data-national-survey-impact-pandemic-higher-ed-opinion.

[2] Ruby Cheng, "Higher Ed Institutions Aren't Supporting International Students Enough during the COVID-19 Crisis," *Inside Higher Ed*, March 19, 2020, https://www.insidehighered.com/views/2020/03/19/higher-ed-institutions-arent-supporting-international-students-enough-during-covid.

benefits to support furloughed workers.[3] According to a letter from the American Council on Education, which outlines actual and expected revenue shortfalls for a number of states and institutions, the impact on state revenues is likely to continue until a vaccine is widely available.[4]

Another major concern among higher education institutions is loss of tuition revenues for the 2020-2021 academic year and onward. Institutions nationwide were faced with tough choices about how to conduct instruction during fall 2020, and many have already been hit by a drop in tuition revenues from students who can either no longer afford to attend, or are dissatisfied with online instruction options. Beyond tuition, closure of campus facilities has led to significant losses in auxiliary revenues such as room and board, dining, and parking fees.[5]

## Impacts of the Pandemic on Students

Students themselves have also suffered financially from the COVID-19 pandemic. A survey of over 1,500 students at Arizona State University found that "40% have lost a job, internship, or job offer, and…[l]ower-income students are 55% more likely than their higher-income peers to have delayed graduation due to COVID-19."[6] Students who work while attending classes have also been impacted by the broader hit to the economy, as "[w]orking students suffered a 31% decrease in their wages and a 37% drop in weekly hours worked, on average...and 61% reported having a family member that experienced a reduction in income."[7] A Pew Research Center Report found that "young adults ages 18 to 29 were also more likely than older Americans to say that they have lost a job or taken a pay cut because of the coronavirus outbreak."[8]

For students who can afford continued attendance, the sudden shift to online learning has been a challenge in and of itself. Lack of access to appropriate technology and/or adequate spaces for completing coursework negatively affected students who relied on campus resources. According

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[3] Office of Postsecondary Education, "CARES Act: Higher Education Emergency Relief Fund," Laws, United States Department of Education, October 29, 2020, https://www2.ed.gov/about/offices/list/ope/caresact.html; Natalie Schwartz, "How Colleges Fared in the Paycheck Protection Program," *Education Dive*, August 19, 2020, https://www.educationdive.com/news/how-colleges-fared-in-the-paycheck-protection-program/583159/.

[4] Ted Mitchell, "Letter to Congressional Leaders on COVID-19 Relief for Higher Education," December 2, 2020, https://www.acenet.edu/Documents/Letter-Congressional-Leaders-COVID-Relief-120220.pdf.

[5] Mitchell, "Letter to Congressional Leaders".

[6] Esteban M. Aucejo et al., "The Impact of COVID-19 on Student Experiences and Expectations: Evidence from a Survey," *Journal of Public Economics* 191 (November 1, 2020): 1, https://doi.org/10.1016/j.jpubeco.2020.104271.

[7] Aucejo et al., "Impact of COVID-19," 2.

[8] Kim Parker, Rachel Minkin, and Jesse Bennett, "Economic Fallout From COVID-19 Continues To Hit Lower-Income Americans the Hardest," *Pew Research Center's Social & Demographic Trends Project*, September 24, 2020, https://www.pewsocialtrends.org/2020/09/24/economic-fallout-from-covid-19-continues-to-hit-lower-income-americans-the-hardest/.

to a nationwide survey from Ithaka S+R, "it was easier for White students (by a three to 15 point margin) to access computers and laptops than any other racial or ethnic group. Providing relevant technological support to students who need it the most is an important step toward closing equity gaps."[9] A survey of undergraduate STEM majors found that these students were concerned about nearly all aspects of returning to campus and online learning.[10] For these students, "a shift to virtual learning may be particularly disruptive as many courses involve hands-on components difficult to recreate virtually (e.g., laboratory)."

## Implications

- Libraries and higher education institutions need to prepare for potential budget shortfalls in upcoming budget cycles.
- Libraries should continue to increase virtual and online services to support online learning.
- Libraries may want to prioritize offerings that support students who are struggling financially or with technology access in order to complete their studies.

# Diversity, Equity, and Inclusion

## Black Lives Matter, Higher Education, and Libraries

While higher education and libraries have been discussing racism and social justice for many years, the horrific events of 2020 brought renewed focus to these issues. In light of continued anti-Black brutality in the United States and the murders of George Floyd, Breonna Taylor, Ahmaud Arbery, and many others, the country witnessed renewed calls for police accountability and anti-racist actions to dismantle systemic racism and oppression. Many colleges and universities issued statements of support and sympathy, and in the wake of the renewed Black Lives Matter movement, student activists called for institutions to "sever ties with the police," "remove symbols of oppression," "hire people of color," and "diversify the curriculum," among other demands.[11]

In response to these murders, similar statements were issued by libraries and library organizations across the country, including the Black Caucus of ALA, Association of College &

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[9] Melissa Blankstein, Jennifer K. Frederick, and Christine Wolff-Eisenberg, "Student Experiences During the Pandemic Pivot" (Ithaka S+R, June 25, 2020), 8, https://sr.ithaka.org/publications/student-experiences-during-the-pandemic-pivot/.

[10] Lindsay Palmer et al., "Health and Education Concerns about Returning to Campus and Online Learning during the COVID-19 Pandemic among US Undergraduate STEM Majors," *SocArxiv*, November 20, 2020, https://doi.org/10.31235/osf.io/g3abx.

[11] Katherine Mangan and Marc Parry, "What College Activists Want," The Chronicle of Higher Education, July 15, 2020, https://www.chronicle.com/article/what-college-activists-want.

Research Libraries (ACRL), Association of Research Libraries (ARL), and many others.[12] Some of these statements focused on expressing support and sympathy, while others called for specific actions. While this groundswell of support and renewed focus was inspiring, many experts also noted that statements without commitment to concrete actions to create anti-racist cultures and policies might be considered performative and meaningless.[13] In addition, it was noted that such actions must move beyond simply learning about systemic racism and compiling reading lists toward implementing anti-racist initiatives, or risk maintaining the status quo. Speaking to librarians, they ask, "What could the nation's future look like if the profession tasked with teaching children and adults about information, misinformation, media literacy, data and science literacy eschewed the myth of institutional neutrality, adopted anti-racist practices, and empowered oppressed members of our communities?"[14]

In their statements, the ACRL called on its members "to reflect and take action against systemic injustices and inequitable policing practices," and the ARL urged library leaders "to examine our institutions' role in sustaining systems of inequity that have left Black communities and other people of color in the margins of every aspect of our profession."[15] They outline specific strategies that include encouraging professional development on diversity, equity, and inclusion (DEI); recruiting and retaining more Black, Indigenous, and people of color (BIPOC); intentionally building collections "that represent the voices and expressions of BIPOC and other underrepresented communities"; and engaging in voting and local politics in support of anti-racist policies.

Campus policing is a particularly important issue to examine in this context. In response to the continued killing of unarmed Black people by the police, there have been increasing calls for

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[12] Black Caucus of The American Library Association (BCALA), "Statement Condemning Increased Violence and Racism Towards Black Americans and People of Color," May 28, 2020, http://www.ala.org/advocacy/sites/ala.org.advocacy/files/content/Statement%20Condemning%20Increased%20Violence%20and%20Racism%20Towards%20Black%20Americans%20and%20People%20of%20Color.pdf; Association of College & Research Libraries, "ACRL Supports ALA, BCALA, and APALA Statements Condemning Violence and Racism," *ACRL Insider*, June 2, 2020, https://acrl.ala.org/acrlinsider/archives/19911; Association of Research Libraries, "Association of Research Libraries Condemns Racism and Violence against Black Communities, Supports Protests against Police Brutality," ARL News, June 5, 2020, https://www.arl.org/news/association-of-research-libraries-condemns-racism-and-violence-against-black-communities-supports-protests-against-police-brutality/; Gary Price, "Statements From Libraries and Library Organizations Re: Racism, Black Lives Matter, and Increased Violence," Infodocket, June 1, 2020, https://www.infodocket.com/2020/06/01/statements-from-library-organizations-re-racism-and-increased-violence/.

[13] Amelia N. Gibson et al., "Struggling to Breathe: COVID-19, Protest and the LIS Response," *Equality, Diversity and Inclusion: An International Journal*. Published electronically August 4, 2020, https://doi.org/10.1108/EDI-07-2020-0178.

[14] Gibson et al., "Struggling to Breathe," 77.

[15] Association of College & Research Libraries, "ACRL Supports ALA, BCALA, and APALA Statements Condemning Violence and Racism"; Association of Research Libraries, "Association of Research Libraries Condemns Racism and Violence against Black Communities, Supports Protests against Police Brutality."

colleges and universities to rethink the role of campus police and their relationships with local police agencies.[16] To support these demands, activists point to police violence toward Black people and other people of color, and the police's historical role in sustaining white supremacy and white supremacist culture. While police presence may help some people feel more comfortable, it causes discomfort and trauma for many BIPOC individuals.[17] There have been similar calls for libraries to re-examine their relationship with policing including a petition that calls for institutions to ultimately abolish law enforcement and ban surveillance technologies from campus spaces.[18] Noting that police and security presence make many members of the community feel unsafe, that calling the police risks violence against our patrons, and that surveillance technology invades patron privacy, the Library Freedom Project urges libraries to focus instead on de-escalation strategies, staff training, and collaborations with social welfare and mental health services as an alternative.[19]

As another way to show support, campuses and libraries have begun reviewing and removing building names, library names, plaques, and public art where the represented person has a documented history of promoting racism or reinforcing systemic oppression. For example, Louisiana State University removed the name of a known segregationist from its library building.[20] Others, like Miami University, are renaming buildings to honor BIPOC alumni.[21] However, activists point out that renaming buildings can only be a first step and more substantive action to address systemic racism is necessary.[22]

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[16] Emma Whitford and Lilah Burke, "Students Demand Campuses Cut Ties With Police," Inside Higher Ed, June 5, 2020, https://www.insidehighered.com/news/2020/06/05/students-demand-universities-break-ties-local-police-few-have.

[17] Whitford and Burke; Ben Robinson, "No Holds Barred: Policing and Security in the Public Library," *In the Library with the Lead Pipe*, December 11, 2019, http://www.inthelibrarywiththeleadpipe.org/2019/no-holds-barred/.

[18] Library Freedom Project, "It's Not Enough to Say Black Lives Matter — Libraries Must Divest from the Police," June 9, 2020, https://medium.com/@libraryfreedom/its-not-enough-to-say-black-lives-matter-libraries-must-divest-from-the-police-2ab4adea58f1; Cass Balzer, "Rethinking Police Presence: Libraries Consider Divesting from Law Enforcement," *American Libraries*, October 2020, https://americanlibrariesmagazine.org/2020/07/08/rethinking-police-presence/; AbLA Ivy+, "A Call for Ivy+ Libraries to Divest from Police and Prisons and Invest in Life-Giving Resources," October 28, 2020, https://ablaivy.medium.com/a-call-for-ivy-libraries-to-divest-from-police-and-prisons-and-invest-in-life-giving-resources-fdd5889270df.

[19] Library Freedom Project, "It's Not Enough to Say Black Lives Matter — Libraries Must Divest from the Police."

[20] Lisa Peet, "LSU Renames Library, Others Step Up," *Library Journal*, August 2020, https://www.libraryjournal.com/?detailStory=LSU-renames-library-schools-across-nation-take-similar-steps-to-address-racist-past.

[21] Miami University, "Miami University Names Building after First Black Graduate," September 25, 2020, https://www.miamioh.edu/news/top-stories/2020/09/nellie-craig.html.

[22] Marc Parry, "Colleges Are in for a Racial Reckoning. Name Changes Are Only the Beginning," The Chronicle of Higher Education, July 5, 2020, https://www.chronicle.com/article/colleges-are-in-for-a-racial-reckoning-decisions-about-renaming-are-only-the-beginning.

Many question whether colleges, universities, and libraries will take meaningful action.[23] Past inaction has not inspired confidence that things will truly change this time, though perhaps the country has finally reached a turning point that will impel action.[24] With COVID-19 disproportionately impacting BIPOC communities, we cannot also ask our BIPOC staff to take on the disproportionate burden of educating their colleagues and implementing DEI and anti-racist initiatives. Higher education and library leaders and staff must demonstrate a commitment through concrete actions that strive for real change -- time will tell if their expressions of support were merely empty promises.

## *Implications*

- Library administrators must commit to concrete actions to implement anti-racist practices across their organizations and institute accountability measures to publicly track progress.
- Library administrators and managers should implement training for their staff on de-escalation strategies, explore partnering with campus mental health services, and re-examine their policies around when to call campus police.
- Library administrators and librarians should undertake reviews of their library names and public art to identify potential candidates for removal and/or addition in order to create more welcoming and inclusive environments.

## Equity in Assessment

Increased focus on DEI issues have led to an interest in equitable assessment practices in higher education. In fall 2019, a special issue of the journal *Intersection* was published by the Association for the Assessment of Learning in Higher Education (AALHE) that focused on equitable assessment.[25] In January 2020, the National Institute for Learning Outcomes Assessment (NILOA) published a report proposing steps for increasing equity over the next decade and outlining several approaches toward equitable assessment, such as creating "multiple sources of evidence that are culturally responsive to current students" and including student voices in developing assessments.[26] The use of disaggregation techniques may allow existing institutional data to reveal equity gaps and appropriate, equity-minded interventions may then be

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[23] Danielle McLean, "As Protests Raged, These Colleges Wrote Strong Words. But Will They Act?," The Chronicle of Higher Education, June 16, 2020, https://www.chronicle.com/article/as-protests-raged-these-colleges-wrote-strong-words-but-will-they-act.

[24] Gibson et al., "Struggling to Breathe."

[25] Kathleen Gorski, ed., "Intersection," *Intersection: A Journal at the Intersection of Assessment and Learning* (Fall 2019): 39, https://www.aalhe.org/assets/docs/Intersection/AAHLE_fall_2019_Intersection_final.pdf.

[26] Erick Montenegro and Natasha A. Jankowski, "A New Decade for Assessment: Embedding Equity into Assessment Praxis" (NILOA, n.d.), 7, https://www.learningoutcomesassessment.org/wp-content/uploads/2020/01/A-New-Decade-for-Assessment.pdf.

devised.[27] New assessments can be developed with an eye towards capturing the experiences of minoritized groups, whose experiences may not well be captured through survey methods or who may be underrepresented in research samples.[28]

Alongside a general orientation towards equity in assessment, many institutions have shifted towards competency-based education frameworks focused on real-world application of skills or other "ungrading" approaches in opposition to traditional grades for student work.[29] Portland State University is an example of an institution that has shifted from a standardized testing approach towards other options for evaluation of student learning, such as ePortfolios.[30] Such "test-optional" approaches may be of particular concern for disciplines that have traditionally relied heavily on standardized testing and other assessment methods that are known to systematically disadvantage certain student populations.[31]

A hastened shift towards online learning as a result of the pandemic has also drawn attention to equity and privacy concerns with online learning platforms and proctoring tools.[32] An EDUCAUSE poll of three hundred higher education institutions reported that 54% were using remote online proctoring software.[33] As of 2020, textbook publisher McGraw-Hill offers bundles of online proctoring and browser locking software with digital textbooks.[34] Students at the City University of New York and the University of Illinois at Urbana-Champaign created petitions to remove Proctorio proctoring software, citing concerns around the software's ability to monitor certain information like keystrokes and downloads as well as vague terms of service language,

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[27] Jeff Roberts, "An Argument for Employing an Equity Mindset in Higher Education Assessment," *Intersection* (Fall 2019), https://www.aalhe.org/assets/docs/Intersection/AAHLE_fall_2019_ Intersection_final.pdf.

[28] Hyun Kyoung Ro and Ellen M. Broido, "Hearing and Responding to Marginalized Voices: Tangible Guidance for Comprehensive Inclusive Assessment," *New Directions for Student Services* 2020, no. 169 (March 2020), https://doi.org/10.1002/ss.20348.

[29] Mary Tkatchov, "Equity in 'Authentic' Assessments: A Closer Look at Defining and Assessing Learning Outcomes in Competency- Based Education," *Intersection* (Fall 2019), https://www.aalhe.org/assets/docs/Intersection/AAHLE_fall_2019_Intersection_final.pdf.

[30] Rowanna Carpenter, Vicki Reitenauer, and Aimee Shattuck, "Portland State University: General Education and Equitable Assessment," January 1, 2020, https://archives.pdx.edu/ds/psu/33258.

[31] Catherine R. Lucey et al., "Medical Education's Wicked Problem: Achieving Equity in Assessment for Medical Learners," *Academic Medicine* 95, no. 12S (December 2020), https://doi.org/10.1097/ACM.0000000000003717.

[32] Jason Kelley and Lindsay Oliver, "Proctoring Apps Subject Students to Unnecessary Surveillance," *Electronic Frontier Foundation*, August 20, 2020, https://www.eff.org/deeplinks/2020/08/proctoring-apps-subject-students-unnecessary-surveillance.

[33] Susan Grajek, "EDUCAUSE COVID-19 QuickPoll Results: Grading and Proctoring," EDUCAUSE, April 10, 2020, https://er.educause.edu/blogs/2020/4/educause-covid-19-quickpoll-results-grading-and-proctoring.

[34] McGraw-Hill, "McGraw-Hill Selects Proctorio to Deliver Remote Proctoring and Browser Locking Capabilities Within Its Digital Course Materials," McGraw Hill, February 4, 2020, https://www.mheducation.com/news-media/press-releases/mcgraw-hill-proctorio-delivers-remote-proctoring.html.

such as agreeing to allow "Proctorio to monitor you by webcam, microphone, browser, desktop, or any other means necessary to uphold integrity."[35] Such software may include facial-recognition technology, which may have difficulty identifying dark-skinned students, may disadvantage students with neuromuscular disabilities or vision impairments whose movements the software may flag as "suspicious", and may unfairly flag economically disadvantaged students who might disconnect from exams more frequently due to poor wi-fi.[36] In January 2021, the ALA Council passed the Resolution in Opposition to Facial Recognition Software in Libraries citing privacy and equity concerns.[37]

## Implications

- Academic libraries and administrators should consider disaggregating institutional data to identify and address existing equity gaps.
- Libraries should understand that many standard learning assessment techniques systematically disadvantage certain groups, and should begin to explore alternative methods of assessment to allow for students to more fully demonstrate achievement of designated learning goals and outcomes.

## Critical Librarianship

Academic librarianship continues to engage with critical theory, including critical race theory, queer theory, and many others.[38] The goal is to investigate race, gender, social class, power, and other topics in relation to libraries and librarianship in a variety of contexts. The typical end goal of such analyses is to concretely bring about a more just, equitable library experience (and, more broadly, society) for users, students, instructors, and librarians. Critical librarianship also aims to critique the library profession's policies and actions; considering how previously held ideas or values could be injurious to historically disadvantaged populations is a particular focus. Two

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[35] "Do Not Let CUNY Violate Student Privacy," Change.org, accessed February 15, 2021, https://www.change.org/p/chancellor-félix-v-matos-rodríguez-do-not-let-cuny-violate-student-privacy; "Stop Proctoring Exams Through Proctorio at UIUC," Change.org, accessed February 15, 2021, https://www.change.org/p/uiuc-stop-proctoring-exams-through-proctorio-proctoru; Proctorio, "Privacy and Cookies," Proctorio, December 18, 2019, https://proctorio.com/privacy.

[36] Grajek, "EDUCAUSE COVID-19 QuickPoll Results."

[37] ALA Intellectual Freedom Committee, "ALA Intellectual Freedom Committee Report to ALA Council" (2021 ALA Midwinter Virtual, January 26, 2021), http://www.ala.org/aboutala/sites/ala.org.aboutala/files/content/ALA%20CD%2019.1-19.3%20Intellectual%20Freedom%20Ccommittee%20MW%2021_action.pdf.

[38] Sofia Leung and Jorge López-McKnight, "Dreaming Revolutionary Futures: Critical Race's Centrality to Ending White Supremacy," *Communications in Information Literacy* 14, no. 1 (June 1, 2020), https://doi.org/10.15760/comminfolit.2020.14.1.2; Mary Catherine Lockmiller, "Against Medicine: Constructing a Queer-Feminist Community Health Informatics and Librarianship," *In the Library With the Lead Pipe*, September 4, 2019, http://www.inthelibrarywiththeleadpipe.org/2019/against-medicine/.

subfields of critical librarianship, critical pedagogy and critical library instruction, continue to receive significant scholarly attention. *Communications in Information Literacy* recently devoted a special issue primarily devoted to critical library instruction, with articles ranging from developing a care-based assessment framework to utilizing writing across the curriculum (WAC) programming as a model for critical IL instruction efforts.[39]

Various other higher education topics have taken on critical approaches. Folk suggests considering IL as cultural capital so that academic librarians can better account for "persistent racial and social-class achievement gaps."[40] Critical approaches have been applied to collection management and outreach of special collections, e.g., comics librarianship.[41] Cataloging and knowledge organization structure are also continued topics of interest for critical scholars.[42] Critical librarianship was also the topic for an issue of the Advances in Library Administration and Organization book series where discussions of intersectional feminism, social justice, and other topics were applied to various administrative concerns of academic libraries.[43] Furthermore, the University of Arizona's Critical Librarianship & Pedagogy Symposium held its third event since 2016 with presentations on critical topics including anti-racism, Marxism, and white supremacy. In alignment with the Marxist foundations of Critical Theory, there are also critiques of the role of the market and capitalism in both librarianship and information literacy instruction.[44]

Open education and open educational resources (OER) are other recent areas of interest for critical librarianship. The edited volume *Open at the Margins* is one example, and includes arguments for open educational practices that go beyond the 5Rs of OER (Retain, Reuse, Revise,

[39] Maria Accardi, Emily Drabinski, and Alana Kumbier, eds., "Special Issue," *Communications in Information Literacy* 14, no. 1 (June 1, 2020), https://pdxscholar.library.pdx.edu/comminfolit/vol14/iss1/; Veronica Arellano Douglas, "Moving from Critical Assessment to Assessment as Care," *Communications in Information Literacy* 14, no. 1 (June 1, 2020), https://doi.org/10.15760/comminfolit.2020.14.1.4; Margaret Rose Torrell, "That Was Then, This Is Wow: A Case for Critical Information Literacy Across the Curriculum," *Communications in Information Literacy* 14, no. 1 (June 1, 2020), https://doi.org/10.15760/comminfolit.2020.14.1.9.

[40] Amanda Folk, "Reframing Information Literacy as Academic Cultural Capital: A Critical and Equity-Based Foundation for Practice, Assessment, and Scholarship," *College & Research Libraries* 80, no. 5 (July 2019), https://doi.org/10.5860/crl.80.5.658.

[41] Olivia Piepmeier and Stephanie Grimm, eds., *Comics and Critical Librarianship: Reframing the Narrative in Academic Libraries* (Sacramento, CA: Library Juice Press, 2019).

[42] Emily Drabinski, "What Is Critical About Critical Librarianship?," *Art Libraries Journal* 44 (2019), https://doi.org/10.1017/alj.2019.3.

[43] Samantha Schmehl Hines and David H. Ketchum, eds., *Critical Librarianship*, vol. 41, Advances in Library Administration and Organization (Emerald Publishing Limited, 2020).

[44] Dave Ellenwood, "'Information Has Value': The Political Economy of Information Capitalism – In the Library with the Lead Pipe," *In the Library With the Lead Pipe* (August 19, 2020), http://www.inthelibrarywiththeleadpipe.org/2020/information-has-value-the-political-economy-of-information-capitalism/.

Remix, Redistribute) to include notions of social justice.[45] Dai and Carpenter use intersectional feminism as a way to interrogate OER labor.[46] LIS scholars also continue to use new critical approaches and scholars in their theoretical research, such as David Harvey's critical geography to better map and navigate one's information landscape in a particular context like higher education or politics.[47] Intersectional analysis has also been used to investigate and alleviate issues surrounding public libraries and the autism community.[48] Decolonial and indigenous research methods, including ethical research involving Indigenous peoples, continue to be an area of study for social science researchers and librarians.[49]

## Implications

- Librarian collaborations and partnerships with programs or units aiming to support historically disadvantaged students/users should consider the difference between researching to improve library services or resources and a collaboration intending to improve the material situation of such students/users.
- Critical Theory is interdisciplinary and multi-faceted in nature. Accordingly, strong potential exists for critical theory research at the intersection of library and information science (on topics like information literacy, GIS, metadata) and diverse fields including sociology, ecology, and economics.

## Students as Partners

The Students as Partners (SaP) movement is an approach to student engagement in higher education by bringing students and faculty into more intentional, reciprocal partnerships. Cook-Sather notes that SaP programs can promote equity and inclusion, enhance student-staff

[45] Maha Bali et al., eds., *Open at the Margins: Critical Perspectives on Open Education* (Rebus Community, 2020), https://press.rebus.community/openatthemargins/; Suzan Koseoglu, Aras Bozkurt, and Leo Havemann, "Critical Questions for Open Educational Practices," *Distance Education* 41, no. 2 (April 2, 2020), https://doi.org/10.1080/01587919.2020.1775341.

[46] Jessica Y. Dai and Lindsay Inge Carpenter, "Bad (Feminist) Librarians: Theories and Strategies for OER Librarianship," *International Journal of Open Educational Resources* (June 13, 2020), https://www.ijoer.org/bad-feminist-librarians-theories-and-strategies-for-oer-librarianship/.

[47] Andrew Whitworth, *Mapping Information Landscapes: New Methods for Exploring the Development and Teaching of Information Literacy* (Facet, 2020), https://www.cambridge.org/core/product/identifier/9781783304189/type/BOOK.

[48] Amelia N. Gibson and Dana Hanson-Baldauf, "Beyond Sensory Story Time: An Intersectional Analysis of Information Seeking Among Parents of Autistic Individuals," *Library Trends* 67, no. 3 (2019), https://doi.org/10.1353/lib.2019.0002.

[49] Antonia Darder, ed., *Decolonizing Interpretive Research: A Subaltern Methodology for Social Change* (Abingdon, Oxon ; New York, NY: Routledge, 2019); Deborah Lee, "Research and Indigenous Librarianship in Canada," *Canadian Journal of Academic Librarianship* 5 (May 31, 2019), https://doi.org/10.33137/cjal-rcbu.v5.29922.

relationships, and help higher education become more egalitarian.[50] The core of the SaP philosophy of partnership is respect, reciprocity, and shared responsibility in learning.[51] SaP projects can vary from scholarship of teaching and learning case studies describing how such a partnership can lead to positive outcomes to large, university-funded projects such as Bryn Mawr's Students as Learners and Teachers program.[52] Designing, executing, and assessing a SaP program is of particular importance to the movement.[53] Recent scholarly efforts attempt to provide best practices while also acknowledging certain inherent risks and challenges of student-faculty partnership, for example power dynamics between faculty and students.[54] Emphases on personal growth, inequity, and supporting traditionally marginalized students run throughout SaP literature as good pedagogical and programmatic practice.

A SaP approach can also be used to provide an opportunity for students to create syllabi or assessments with faculty for face-to-face, online, or hybrid learning environments.[55] Faculty can also foster student growth by collaborating with students to co-create or redesign entire courses.[56] The SaP philosophy may also be applied to disciplinary research methods. One such study describes a participatory community-based research project where adult college students and faculty collaborated on an outreach initiative to support an economically disadvantaged area.[57]

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[50] Alison Cook-Sather, "Student Engagement through Classroom-Focused Pedagogical Partnership: A Model and Outcomes from the United States," in *A Handbook for Student Engagement in Higher Education: Theory into Practice*, ed. Tom Lowe and Yassein El Hakim (London: Routledge, 2020).

[51] Alison Cook-Sather, "Introduction: Respect, Reciprocity, and Responsibility in Developing Participatory Cultures and Practices," *Teaching and Learning Together in Higher Education* 1, no. 10 (2013), https://repository.brynmawr.edu/tlthe/vol1/iss10/1.

[52] Bryn Mawr College, "SaLT Program," accessed February 18, 2021, https://www.brynmawr.edu/tli/SaLT-Program.

[53] Alison Cook-Sather, Melanie Bahti, and Anita Ntem, *Pedagogical Partnerships* (Elon University Center for Engaged Learning, 2019), https://doi.org/10.36284/celelon.oa1.

[54] Lucy Mercer-Mapstone and Sophia Abbot, eds., *Power of Partnership: Students, Staff, and Faculty Revolutionizing Higher Education* (Elon University Center for Engaged Learning, 2020), https://doi.org/10.36284/celelon.oa2; Lucy Mercer-Mapstone and Jenny Marie, "Practical Guide: Scaling up Student-Staff Partnerships in High Education" (University of Edinburgh: Institute for Academic Development, 2019), http://bit.ly/2EfUR16.

[55] Catherine Bovill, "Co-Creation in Learning and Teaching: The Case for a Whole-Class Approach in Higher Education," *Higher Education* 79, no. 6 (June 2020), https://doi.org/10.1007/s10734-019-00453-w.

[56] Cortney Hanna-Benson et al., "Students as Partners in Collaborative Course Design and Educational Research," *International Journal for Students as Partners* 4, no. 2 (2020), https://doi.org/10.15173/ijsap.v4i2.4237.

[57] Mark Cullinane and Siobhán O'Sullivan, "Evaluating Community-Based Research: Hearing the Views of Student Research Partners," *International Journal for Students as Partners* 4, no. 2 (October 29, 2020), https://doi.org/10.15173/ijsap.v4i2.4203.

There are notable challenges to successfully executing a SaP project, as implementing SaP programming "may result in uncertainty and discomfort, takes time...and can make teachers and students vulnerable to each other."[58] The SaP movement may be most impactful in the scholarship of teaching and learning and the instructional design spheres of higher education. For example, The International Society for the Scholarship of Teaching and Learning (ISSOTL) has recently borrowed from the SaP movement, dedicating several sessions and pre-conference workshops to discussing the topic.[59]

## *Implications*

- Given the positive outcomes documented in the nascent SaP movement, academic library leadership should prioritize student voices and experiences more in areas including, but not limited to, instruction, employment, and LIS research.
- Academic libraries should consider utilizing SaP approaches as a concrete way to address systemic issues of inequality in higher education.

# Expanding Literacies

While information literacy is a topic of which libraries have traditionally taken ownership, we are seeing more and more additional literacies being taught by librarians across all spheres, such as data literacy, financial literacy, and maker literacy. These and similar skills are becoming necessary for large portions of the workforce and society as a whole. We anticipate that librarians will begin to take a larger role in such metaliteracy efforts that will help students become not only skilled members of the workforce but also informed and engaged citizens in their own right.

## Digital Literacy

The extreme polarization of the United States, especially as influenced by the Trump Administration, is not a new topic, but combating it gained new urgency in 2020 with the COVID-19 pandemic, the resurgence of the Black Lives Matter movement, and the presidential election. Conspiracy theories and misinformation surrounding these and other events was and continues to be rampant, and has prompted renewed calls for a more digitally-literate populace.[60]

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[58] Ashley J Holmes, "'Being Patient through the Quiet': Partnering in Problem-Based Learning in a Graduate Seminar," *International Journal for Students as Partners* 4, no. 1 (April 9, 2020): 34, https://doi.org/10.15173/ijsap.v4i1.3926.

[59] Sophia Abbot and Ketevan Kupatadze, "Students as Partners at ISSOTL 2018," *International Society for the Scholarship of Teaching and Learning (ISSOTL)*, 2019, https://issotl.com/2019/03/23/students-as-partners-at-issotl-2018/.

[60] Beth McMurtrie, "Teaching in the Age of Disinformation," The Chronicle of Higher Education, January 13, 2021, https://www.chronicle.com/article/teaching-in-the-age-of-disinformation.

More and more people are using social media as their primary news source—including a plurality of adult "Gen Zers", which currently make up the majority of undergraduate students—and those that do so are less likely to be knowledgeable about the facts surrounding important events.[61] Social media is here to stay, and educators need to adapt their instruction accordingly.

Much information literacy instruction of the past couple of decades has focused on using checklists (e.g., the CRAAP test) for evaluating online content. However, critique of the checklist model has been growing steadily in recent years, especially with regard to social media.[62] Many of these tests were created in the early days of the internet, and so are not easily applied to information in the current social media-based information landscape. As such, there has been rapidly-growing interest in and research on teaching lateral readings skills (as opposed to the commonly-taught vertical reading), where students are encouraged to go beyond a particular website and more critically evaluate information based on what others have to say about it.[63] Lateral reading-based evaluation strategies have been shown to be effective, particularly when used to evaluate social media content. However, many professors grew up learning vertical reading-based evaluation skills, and so are not well equipped to teach their students to accurately evaluate the credibility of the many different types of information available today.

This is not news to librarians, but, considering the events of the past year in particular, should be a wake-up call that more needs to be done to teach these vital skills, and not just to students. True, students are our primary focus in the classroom, but faculty have much more influence over what skills their students learn and how well they learn them, and we should also take more aggressive steps to educate faculty about current practices in online evaluation skills.

## Science Literacy

The misinformation surrounding the novel coronavirus also laid bare the general lack of basic science literacy among adults. For example, wearing a mask has been repeatedly shown to reduce transmission of the virus, yet roughly 20% of survey respondents were either unsure if masks help contain the spread, believed that masks do nothing, or were positive that masks

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[61] Amy Mitchell et al., "Americans Who Mainly Get Their News on Social Media Are Less Engaged, Less Knowledgeable," *Pew Research Center's Journalism Project*, July 30, 2020, https://www.journalism.org/2020/07/30/americans-who-mainly-get-their-news-on-social-media-are-less-engaged-less-knowledgeable/; Morning Consult and Politico, "National Tracking Poll 200977," 2020, https://www.politico.com/f/?id=00000175-0dab-db77-abff-2dbbc9ea0000.

[62] Sam Wineburg and Sarah McGrew, "Lateral Reading and the Nature of Expertise: Reading Less and Learning More When Evaluating Digital Information," *Teachers College Record* 121, no. 11 (November 1, 2019), https://www.tcrecord.org/content.asp?contentid=22806.

[63] Wineburg and McGrew; Jamie M. Addy, "The Art of the Real: Fact Checking as Information Literacy Instruction," *Reference Services Review* 48, no. 1 (January 2020), https://doi.org/10.1108/RSR-09-2019-0067.

*increase* virus transmission.[64] This lack of science literacy also corresponds to a general distrust of science. A survey by Pew Research Center showed that roughly one in four US adults believed that Donald Trump and his administration—who were actively spreading misinformation about the pandemic—were providing correct information about COVID-19 "most of the time" or "almost all of the time."[65] At the same time, more than one in three respondents believed that the CDC and other health organizations were providing correct information "some of the time" or "hardly ever."

Some science and other librarians are well-suited to facilitate collaborations and support institutional initiatives to teach basic science literacy skills, as they are so closely linked to many other literacies we already teach (e.g., digital literacy, data literacy) and to information literacy as a whole.

## Privacy Literacy

Privacy literacy is also gaining in popularity as a topic of discussion. As addressed in this and previous environmental scans, research outputs and education materials are being shared in increasingly open and multimodal ways. This trend necessitates a corresponding rethinking of information literacy, as information-seeking behavior moves into more open discovery environments, often supported by economies of surveillance as outlined in Zuboff's much-discussed 2019 work, *The Age of Surveillance Capitalism*.[66] In increasingly surveilled information-seeking environments, it is understandably "hard to know the best way to approach teaching students about how information works in the world we inhabit today."[67] The pandemic, and its corresponding emphasis on remote and online education has exasperated this issue.

One approach is to integrate privacy literacy into libraries. Hartman-Caverly and Chisholm make the case that privacy literacy can and should be integrated into the ACRL Framework for

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[64] Jeremy Howard et al., "An Evidence Review of Face Masks against COVID-19," *Proceedings of the National Academy of Sciences* 118, no. 4 (January 26, 2021), https://doi.org/10.1073/pnas.2014564118; Edward S. Knotek II et al., "Consumers and COVID-19: Survey Results on Mask-Wearing Behaviors and Beliefs," *Economic Commentary*, no. 2020–20 (July 16, 2020), https://doi.org/10.26509/frbc-ec-202020.

[65] Pew Research Center, "American News Pathways Data Tool," accessed January 29, 2021, https://www.pewresearch.org/pathways-2020/; Sarah Evanega et al., "Coronavirus Misinformation: Quantifying Sources and Themes in the COVID-19 'Infodemic'" (The Cornell Alliance for Science, October 2020), https://allianceforscience.cornell.edu/wp-content/uploads/2020/10/Evanega-et-al-Coronavirus-misinformation-submitted_07_23_20-1.pdf.

[66] Shoshana Zuboff, *The Age of Surveillance Capitalism* (PublicAffairs, 2019), https://www.publicaffairsbooks.com/titles/shoshana-zuboff/the-age-of-surveillance-capitalism/9781610395694/.

[67] Barbara Fister, "Information Literacy's Third Wave," Inside Higher Ed, February 14, 2019, https://www.insidehighered.com/blogs/library-babel-fish/information-literacy%E2%80%99s-third-wave.

Information Literacy for Higher Education.[68] They argue that helping students recognize that "privacy is a value system before it is a technology" may help them to understand our increasingly complex information ecosystems. This can, in turn, help them see how research privacy is a necessary condition for intellectual freedom -- a core value of ALA -- and incentivize them to take steps to enhance their own online privacy.

Many libraries already integrate privacy literacy into their instructional activities. Librarians at Vanderbilt University hosted an undergraduate fellowship, Privacy, Surveillance, and Intellectual Freedom, to both connect students with these concepts and foster the creation of student-produced privacy advocacy materials.[69] Organizations such as the Library Freedom Project and Digital Shred have also created privacy literacy teaching materials that can be used in library instruction settings, while the ACRL Instruction Section Current Issues recently explored the topic of privacy literacy in libraries.[70]

## Data Literacy and Ethics

Data literacy has been a hot topic in academic libraries for several years. It has primarily been focused on research data and implemented within graduate programs, but basic data literacy and knowledge of analytics is becoming more important for everyone, particularly where it intersects with privacy literacy. Libraries have an opportunity to help educate both students preparing to enter the workforce and employees at their own institutions. Institutions of higher education are sitting on an enormous trove of data that gets bigger and more granular every year.[71] Many institutions are attempting to use their data to support things like student success, retention, and fundraising, to name a few, and are involving more campus partners in order to do so.[72] However, the potential issues surrounding the use of these data are extremely important for institutions to consider. Students often have little or no control over the data that are collected

[68] Sarah Hartman-Caverly and Alexandria Chisholm, "Privacy Literacy Instruction Practices in Academic Libraries: Past, Present, and Possibilities," *IFLA Journal* 46, no. 4 (August 28, 2020), https://doi.org/10.1177/0340035220956804.

[69] Andrew Wesolek and Melissa Mallon, "Privacy, Surveillance, & Intellectual Freedom: Buchanon Library Fellowship," Fall 2020, https://researchguides.library.vanderbilt.edu/c.php?g=1099446&p=8018439.

[70] Alexandria Chisholm and Sarah Hartman-Caverly, "Digital Shred: Privacy Literacy Toolkit," accessed February 12, 2021, https://sites.psu.edu/digitalshred/; Library Freedom, "Library Freedom Resources," accessed February 12, 2021, https://libraryfreedom.org/resources/.

[71] Carrie Klein and Michael Brown, "Ethics at the Core," Business Officer, April 5, 2019, https://www.businessofficermagazine.org/features/ethics-at-the-core/; Association for Institutional Research, EDUCAUSE, and National Association of College and University Business Officers, "A Joint Statement on Analytics," 2020, https://changewithanalytics.com/wp-content/uploads/2020/02/Joint_Analytics_Statement_2020.pdf.

[72] Archie P. Cubarrubia, "We All Need to Be Data People," The Chronicle of Higher Education, October 13, 2019, https://www.chronicle.com/article/we-all-need-to-be-data-people/.

about them, if they are even aware of them at all. Third-party vendors are contracted to collect much of the data in use today, but, more often than not, they are opaque about how the data are collected, stored, and analyzed. These so-called "black box technologies" can lead to biased analyses and discrimination.[73] The ALA Intellectual Freedom Committee has been investigating these technologies and the privacy implications surrounding their data, and proposed two resolutions in their report to the ALA Council at the January 2021 Midwinter meeting.[74] The resolution to oppose facial recognition software was adopted by the Council, and the resolution about the misuse of data surveillance is continuing to be discussed.

While the Family Educational Rights and Privacy Act (FERPA) protects the confidentiality of student educational records, there are virtually no federal rules or regulations that govern many of the non-educational types of student data collected by higher education institutions, and only a handful of state or local laws that do so.[75] Therefore, institutions need to take action now to create comprehensive data governance and privacy guidelines for themselves, and libraries are well-positioned to assist with this, particularly where ethical data use is concerned. Also, with many new campus partners likely to become involved with analytics and strategic planning, data librarians are in a good position to assist with internal training on responsible and ethical use of data, if they so choose.

### Implications

- Library administrators need to advocate for responsible use of student data by institutional administration, including pushing for comprehensive data governance policies that are student-focused and privacy-centric.
- Data specialists should consider planning for internal campus training on responsible and ethical use of data.
- Library instructors should consider integrating training on the implications of behavioral data surveillance in research environments into their information literacy programs.

# Collections and Access Services

## Response to Access Challenges Due to COVID-19

When most institutions made the switch to remote teaching in March 2020, it was around the same time that their students were on spring break. In many cases, when students returned to their homes, it was without their required textbooks and other course materials, presenting an

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[73] Klein and Brown, "Ethics at the Core."

[74] ALA Intellectual Freedom Committee, "ALA Intellectual Freedom Committee Report to ALA Council."

[75] Student Privacy Compass, "Higher Education Institutions," Student Privacy Compass, accessed January 29, 2021, https://studentprivacycompass.org/audiences/higher-ed/.

access gap that might otherwise be filled by physical course reserves. While many vendors responded with temporary pro-bono access to their electronic materials, many libraries struggled to scale up their efforts to meet the surge in demand for electronic course reserves services.[76] Some started expanding their efforts to educate faculty on fair use and copyright in sharing course materials online. Notably, a group of more than 50 copyright specialists at institutions in the US and Canada signed a public statement encouraging libraries to rely heavily on fair use when making course materials available for emergency remote teaching.[77] The document also provided institutions with guidance in making fair use determinations given a far more extensive set of constraints placed on time and resources. It is yet to be seen how this heightened emphasis on fair use will affect libraries' long-term efforts to make materials accessible to their communities, but as libraries have strengthened their fair use muscles, so to speak, it stands to reason that they may be more confident in exercising them in a post-pandemic future. However, these efforts are likely to be further complicated by the December 2020 passage of the CASE Act, which establishes a new Copyright Claims Board within the Copyright Office to adjudicate small copyright infringement claims.[78]

Some libraries became more outspoken in educating their communities about the role of commercial textbook publishers in restricting libraries' ability to expand access to students. The University of Guelph Library in Canada released a statement listing, by name, those publishers who "will not allow us to purchase an e-textbook version of their publications."[79] The Guelph statement was adapted by Grand Valley State University Libraries, which added "This is not a library problem. This is an industry problem that impacts everyone in higher education."[80] Both statements were subsequently adopted by a number of institutions, including California State University and the University of Rochester.[81] Such bold statements are perhaps indicative of growing resistance to increasingly untenable relationships with commercial publishers, as seen in the cancellation of "big deal" journal packages of recent years.

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[76] University Information Policy Officers, "Vendor Love in the Time of COVID-19," 2020, https://tinyurl.com/vendorsupportedaccess.

[77] "Public Statement of Library Copyright Specialists: Fair Use & Emergency Remote Teaching & Research," March 13, 2020, https://tinyurl.com/tvnty3a.

[78] U.S. Copyright Office, "Congress Passes CASE Act of 2020 and Law Regarding Unauthorized Streaming Services," *NewsNet*, December 22, 2020, https://www.copyright.gov/newsnet/2020/866.html.

[79] University of Guelph Library, "Commercial Textbooks Present Challenges in a Virtual Environment," 2020, https://www.lib.uoguelph.ca/news/commercial-textbooks-present-challenges-virtual-environment.

[80] Grand Valley State University Libraries, "Statement on Textbooks in the Library Collection," July 2020, https://www.gvsu.edu/library/statement-on-textbooks-in-the-library-collection-92.htm.

[81] SPARC, "Pandemic Amplifies Trouble with Restrictive Licensing and E-Textbooks," October 2, 2020, https://sparcopen.org/news/2020/pandemic-amplifies-trouble-with-restrictive-licensing-and-e-textbooks/.

## Implications

- While campuses may gradually return to some level of pre-pandemic normalcy over the next year, it is unlikely that libraries will see a corresponding decrease in demand for electronic access to course materials. Access services staff should expect to expand services like electronic course reserves.
- In light of the CASE Act, scholarly communications librarians should expect to significantly revise their strategies for educating campus constituents on copyright and fair use, and administrators will similarly need to reassess their tolerance for risk.
- As multiple social and economic crises converge in higher education, library administrators, collection developers, and access services staff should evaluate whether commercial textbook publishers' access models prioritize libraries' goals of access and equity.

## Open Educational Resources

Open Educational Resources (OER) initiatives have long been a key component of many institutions' efforts to drive down student costs. Textbook costs, of course, were a concern for many students and faculty even before the economic crisis of 2020. However, with the abrupt transition to emergency remote teaching laying bare some of the other equity gaps related to students' access to course materials, many institutions responded by renewing their emphasis on OER — which offer immediate, gratis, unrestricted, and perpetual access — as an effective tool for more equitable teaching in a time of crisis and even a key component in a reimagined model of higher education.[82] Librarians, in particular, were key drivers of OER as a pandemic response, offering workshops and facilitating grant programs for OER adoption with renewed urgency.

Awareness of, and support for, OER continue to grow. A pre-pandemic report shows that OER initiatives are successfully driving awareness of OER and OER adoption, both of which have risen steadily in recent years, but that the majority of faculty remain unaware of OER and available OER initiatives.[83] Federal funding for open education has grown with the renewal of the Open Textbook Pilot Grant Program, which expanded from $5 million in FY19 to $7 million in FY20.[84] Fully-OER degree programs are emerging, receiving substantial institutional support

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[82] Robin DeRosa, "Practitioner Perspectives: OER and a Call for Equity," New England Journal of Higher Education (New England Board of Higher Education, July 6, 2020), https://nebhe.org/journal/practitioner-perspectives-oer-and-a-call-for-equity/.

[83] Tanya Spilovoy, Jeff Seaman, and Nate Ralph, "The Impact of OER Initiatives on Faculty Selection of Classroom Materials" (Bay View Analytics, 2020), http://www.onlinelearningsurvey.com/oer.html.

[84] Nicole Allen, "Congress to Renew Open Textbook Pilot Grant Program with $7 Million Appropriation," SPARC, December 17, 2019, https://sparcopen.org/news/2019/congress-renews-open-textbook-pilot-grant-program-with-7-million/.

as they reduce student costs, contribute to positive academic outcomes, and even show promise for a positive return on investment for institutions.[85]

## Implications

- As more faculty have gained experience teaching in different teaching modalities as a result of the pandemic, expect to see among faculty an increased interest in OER as a path to more equitable, open, and student-centered pedagogy.
- It remains to be seen what long-term effects the pandemic will have on OER, but it seems likely that it will have pushed OER awareness past a tipping point. As campuses begin the long transition into post-pandemic operations, administrators and open education advocates at institutions of all types should seriously consider how OER fits into their institutional strategies.

## Controlled Digital Lending

Controlled digital lending (CDL) first emerged as a white paper and position statement in 2018.[86] Originally envisioned as a solution to the orphan works problem of the 20th century—meaning works whose copyright status is notoriously difficult to determine—interest in CDL increased dramatically as the COVID-19 pandemic restricted access to library physical collections.

CDL is a legal argument, not established law, that claims libraries may legally circulate digitized titles in place of physical titles held in their collections, in a controlled manner. Relying on existing carve outs in the exclusive rights of copyright holders, specifically the first sale doctrine, fair use, and Section 108, CDL argues that so long as a library legally owns a physical copy of a title, it may digitize that title. Librarians may also make a title available if it maintains the appropriate "own-to-loan" ratio, and uses digital rights management (DRM) software to limit the duration of a digital "checkout" and prevent further copying and distribution of the digital file.[87]

As libraries scrambled to provide safe access to their materials during the COVID-19 pandemic, CDL was implemented in a variety of forms, including the Emergency Temporary Access

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[85] Rebecca Griffiths et al., "OER at Scale: The Academic and Economic Outcomes of Achieving the Dream's OER Degree Initiative" (Menlo Park, CA: SRI International, 2020).

[86] David R. Hansen and Kyle K. Courtney, "A White Paper on Controlled Digital Lending of Library Books" (LawArXiv, September 24, 2018), https://doi.org/10.31228/osf.io/7fdyr; Lila Bailey et al., "Position Statement on Controlled Digital Lending," Controlled Digital Lending by Libraries, September 2018, https://controlleddigitallending.org/statement.

[87] Bailey et al., "Position Statement on Controlled Digital Lending."

Service from Hathi Trust, and the National Emergency Library of the Internet Archive.[88] These approaches are not without controversy, though, as the Internet Archive is currently involved in a lawsuit and the Author's Guild has vociferously opposed CDL in any form.[89] Cautious of further lawsuits, many libraries are quietly exploring approaches to CDL that balance copyright concerns with the access concerns of their patrons. The Association of Southeastern Research Libraries (ASERL), for example, formed an informal discussion group centered on CDL, resulting in a recently-released resource page on the topic.[90]

## *Implications*

- Library administrators should closely monitor the lawsuits related to CDL and collectively articulate a legally-defensible vision for CDL.
- Collections and access services librarians should monitor the use of emergency temporary CDL programs on their campuses and their potential to influence future collection development decisions.

## License Negotiations: Big Deal Cancellations and Transformative Agreements

After years of debate, more academic libraries have begun to rethink the big deal, often with support from their faculty. Florida State University, Iowa State University, the State University of New York (SUNY), the University of California, and the University of North Carolina-Chapel Hill have all cancelled big deal packages in recent years. These decisions have been driven by evolving licensing principles, increased open access content, cost considerations, and new tools to analyze the impact of more targeted subscriptions.[91] With current and inevitable future budget cuts taking place across the country, one can expect this trend to continue. Colleges and universities are facing difficult times that will impact academic library budgets, prompting major

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[88] HathiTrust Digital Library, "Emergency Temporary Access Service," accessed February 3, 2021, https://www.hathitrust.org/ETAS-Description; Internet Archive, "National Emergency Library," *Internet Archive Blogs*, accessed February 3, 2021, https://blog.archive.org/national-emergency-library/.

[89] Jeff John Roberts, "As Libraries Fight for Access to E-Books, a New Copyright Champion Emerges," Fortune, November 28, 2020, https://fortune.com/2020/11/28/digital-publishing-copyright-champion-lila-bailey-internet-archive/; The Authors Guild, "Controlled Digital Lending Is Neither Controlled nor Legal," The Authors Guild, January 9, 2019, https://www.authorsguild.org/industry-advocacy/controlled-digital-lending-is-neither-controlled-nor-legal/.

[90] John Burger et al., "Future Thinking: ASERL's Resource Guide to Controlled Digital Lending for Research Libraries" (Association of Southeastern Research Libraries, February 2021), http://www.aserl.org/wp-content/uploads/2021/02/Future_Thinking__ASERL_CDL_Resource_Guide__PDF.pdf.

[91] Dalmeet Chawla, "This Tool Is Saving Universities Millions of Dollars in Journal Subscriptions," *Science*, July 9, 2020, https://doi.org/10.1126/science.abd7483; Gale S. Etschmaier, Robin N. Sinn, and Jason Priem, "Negotiating Big Deals: ACRL/SPARC Forum at the 2020 ALA Midwinter Meeting," *College & Research Libraries News* 81, no. 7 (July 8, 2020), https://doi.org/10.5860/crln.81.7.341; SPARC, "Big Deal Cancellation Tracking," 2020, https://sparcopen.org/our-work/big-deal-cancellation-tracking/.

transformations in collection management, including the consideration of how to manage big deal packages.

One example from the current fiscal year challenges can be found at the University of Massachusetts Amherst, where the Libraries had to make a $445,000 cut to collections. The UMass Amherst Libraries explained their challenges of continuing to purchase big deals to faculty via a website: "...the Big Deal, initially an incentive for libraries to invest in a broad range of scholarly journals, in practice encumbers over 80% of academic libraries' acquisition budgets. Costs for these packages have risen by 3-9% annually for years, and are expected to increase again in 2021."[92] Thus while publishers reap the benefits of compounding interest from big deal packages, libraries continue to struggle finding ways to keep paying.

Librarians face difficult decisions in trying to provide access to journals when going through a big deal cancellation, and it is not always cost-effective to buy back the most heavily-used titles. Lisa Janicke Hinchliffe has written extensively about these types of collection decisions that involve moving from big deals to a la carte titles or smaller packages. "The universe of libraries that even have Big Deal contracts that might be broken is relatively limited; some research libraries have never been able to afford the Big Deal," Hinchliffe says, adding, "Nonetheless, examining those that unbundle can give us some empirical insight into the dynamics at play."[93]

As more libraries determine the best approach to managing collection budgets while facing cuts, current literature is available for handling and monitoring big deals. Eleven research libraries have also partnered with Ithaka S+R on a project to study the long-term effects of big deal cancellations.[94] There is also a website managed by the Scholarly Publishing and Academic Coalition (SPARC) that allows librarians to track the latest news and cancellations taking place.[95]

On the other hand, while some institutions are cancelling their big deals, others are trying to accelerate the transition to open access through a new form of big deal—the transformative agreement. Inspired by Plan S and the goal to make institutional research more broadly and openly available, libraries and consortia have been working with publishers to develop a variety

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[92] Sally Krash, "FY21 Acquisitions Budget Reductions," University of Massachusetts Amherst Libraries, 2020, https://www.library.umass.edu/news/fy21-acquisitions-budget-reductions/.

[93] Lisa Janicke Hinchliffe, "What Do Libraries Keep When They Cancel the Big Deal?," *The Scholarly Kitchen*, July 14, 2020, https://scholarlykitchen.sspnet.org/2020/07/14/what-do-libraries-keep-when-they-cancel-the-big-deal/.

[94] Danielle Cooper, "Project Launch: Canceling the Big Deal," *Ithaka S+R*, May 28, 2020, https://sr.ithaka.org/blog/project-launch-canceling-the-big-deal/.

[95] SPARC, "SPARC Debrief on Three Recent Big Deal Cancellations," June 9, 2020, https://sparcopen.org/news/2020/sparc-debrief-on-three-recent-big-deal-cancellations/.

of new open access models and transformative agreements: the California Digital Library multi-payer model, read-and-publish agreements, publish-and-read agreements, collective investment models, and subscribe to open.[96] Borrego, Anglada, and Abadal provide a rich overview of the history, impact, and features of transformative agreements while also noting concerns that have been expressed about them, including that they risk "perpetuating the current system and its associated high costs."[97] Others have also expressed concerns about the potential impact of these agreements on market consolidation, society publishers, and researchers from less well-financed institutions, especially in the Global South. While many of these agreements have been signed with big commercial publishers like Elsevier and Springer Nature, institutions have also reached transformative agreements with university presses, society publishers, and pure OA publishers such as Cambridge University Press, Association for Computing Machinery, American Physiological Society, and the Public Library of Science (PLOS). In addition, EIFL (Electronic Information for Libraries) signed a transformative agreement with IWA Publishing to provide free reading and open access publishing for 26 countries in Africa, Asia, and Europe.[98] Due to the variety of models, terms, and workflows associated with them, there will also be the need for new tools for managing open access agreements.[99]

## Implications

- Librarians should monitor continued developments around big deal cancellations and transformative agreements to learn from new models and approaches to community outreach.
- Libraries facing budget cuts and weighing big deal cancellations might consider leveraging tools such as Unsub to minimize impact during journal cancellations.
- Library, scholarly communications, and publishing leaders need to continue to thoughtfully consider equity and inclusion as they develop new open access publishing models.

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[96] Lisa Janicke Hinchliffe, "Transformative Agreements: A Primer," *The Scholarly Kitchen*, April 23, 2019, https://scholarlykitchen.sspnet.org/2019/04/23/transformative-agreements/; Alicia Wise and Lorraine Estelle, "How Society Publishers Can Accelerate Their Transition to Open Access and Align with Plan S," *Learned Publishing* 33, no. 1 (January 2020), https://doi.org/10.1002/leap.1272.

[97] Ángel Borrego, Lluís Anglada, and Ernest Abadal, "Transformative Agreements: Do They Pave the Way to Open Access?" *Learned Publishing* Early View (December 3, 2020): 4, https://doi.org/10.1002/leap.1347.

[98] Electronic Information for Libraries (EIFL), "EIFL, IWAP Sign Free Read & Publish Agreement," October 26, 2020, https://www.eifl.net/news/eifl-iwap-sign-free-read-publish-agreement.

[99] George Machovec, "Selected Tools and Services for Analyzing and Managing Open Access Journal Transformative Agreements," *Journal of Library Administration* 60, no. 3 (April 2, 2020), https://doi.org/10.1080/01930826.2020.1727280.

# Research Services and Support

## Research Support in HE

Beginning in 2017, Ithaka S+R has been inviting researchers in many different fields to discuss their unique research materials and workflows. The company has produced a series of reports to help stakeholders in research services and support, both within and outside of universities, to understand and be able to address domain-specific needs. Based on the discoveries of the first three fields—religious studies, agriculture, and Asian studies—the authors made the recommendations that we need to see researchers as "collectors" who are managing a variety of research materials, data, and other information, and research supporters should also consider that their researchers may have different research workflows and tools.[100] The Ithaka S+R research group has since continued its investigation and reported findings on additional research fields: indigenous studies, civil and environmental engineering, and languages and literature.[101] Each of these reports provided, for all these various fields, first-hand, in-depth descriptions of what research means, the complete research life cycle, and opportunities that academic libraries and other stakeholders can take advantage of to intervene and enhance the research experience.

In spite of each domain's unique context, researchers' experiences within institutions still share some common characteristics. A survey of the UK, US, and Australia indicates that researchers across multiple disciplines are all facing the pressure of obtaining research funding with insufficient resources and time.[102] Many report that much of their research time is being taken up by administrative tasks, such as seeking out funding opportunities and writing data management plans, opening the door to service opportunities for research offices and libraries. In addition, researchers' support for open access is growing as many are seeking to measure their research impacts, especially social impacts, but are unable to find suitable indicators. Similarly, research administrators want to monitor and showcase researchers' scholarship but have no easily

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[100] Danielle Cooper and Roger Schonfeld, "Supporting the Changing Research Practices of Religious Studies Scholars" (Ithaka S+R, 2017), https://doi.org/10.18665/sr.294119; Danielle Cooper et al., "Supporting the Changing Research Practices of Agriculture Scholars" (Ithaka S+R, June 7, 2017), https://doi.org/10.18665/sr.303663; Danielle Cooper et al., "Supporting the Changing Research Practices of Asian Studies Scholars" (Ithaka S+R, June 21, 2018), https://doi.org/10.18665/sr.307642; Danielle Cooper and Oya Rieger, "Scholars ARE Collectors: A Proposal for Re-Thinking Research Support" (Ithaka S+R, November 28, 2018), https://doi.org/10.18665/sr.310702.

[101] Danielle Cooper et al., "When Research Is Relational: Supporting the Research Practices of Indigenous Studies Scholars" (Ithaka S+R, April 11, 2019), https://doi.org/10.18665/sr.311240; Danielle Cooper et al., "Supporting the Changing Research Practices of Civil and Environmental Engineering Scholars" (Ithaka S+R, January 16, 2019), https://doi.org/10.18665/sr.310885; Danielle Cooper et al., "Supporting Research in Languages and Literature" (Ithaka S+R, September 9, 2020), https://doi.org/10.18665/sr.313810.

[102] Alterline and Ex Libris, "Supporting Academic Research: Understanding the Challenges" (alterline/ExLibris, 2020), https://f.hubspotusercontent00.net/hubfs/5176202/HQ_Research/Supporting%20Academic%20Research%20-%20understanding%20researcher%20challenges_2020.pdf?hsCtaTracking=bc59f202-2765-4736-bc52-f488fbb051c7%7Cab5c60fe-7805-4da8-ad01-c9c871a52b0d.

accessible scholarship data or platform. Libraries' expertise in the research matrix could potentially be leveraged and further developed to fill in these gaps.

Despite persistent financial and administrative challenges in higher education, emerging technologies are bringing new opportunities for researchers and libraries to engage in cross-departmental research collaborations and support the curation and preservation of new types of scholarship (for example, research data).[103] Based on the idea that libraries can embed in research collaborations, the Andrew W. Mellon Foundation recently supported a few of the University of Calgary's multidisciplinary projects focused on new areas of technology, space, and human resources. Hickerson, the PI of this project, reported that in order to be able to help researchers face current and future research challenges, libraries would need to change organizationally and financially.[104]

One such emerging organizational change is the establishment of digital scholarship centers or services in many North American university libraries. In 2020, the Coalition for Networked Information organized a Digital Scholarship Planning Webinar Series for its members.[105] Plenty of models and best practices that have already been developed were shared during the event to help beginners get started and existing programs move on to a new level. For example, Duke University Libraries have been focusing on the digital research needs in the humanities and social sciences, and have coordinated multiple library departments to offer various combinations of support around research content, method, and processes.[106]

As shown in the University of Cincinnati Libraries Research & Data Services development, the library is not the only unit in universities that is responsible for research support.[107] Multiple existing, but scattered, stakeholders of the research enterprise are all trying to assist researchers. Currently siloed and decentralized, with overlapping and related functions, they need some

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[103] Scout Calvert et al., "Future Themes and Forecasts for Research Libraries and Emerging Technologies" (Association of Research Libraries, Coalition for Networked Information, and EDUCAUSE, August 2020), https://doi.org/10.29242/report.emergingtech2020.forecasts.

[104] H. Thomas Hickerson, "A New Synthesis: Research Resources to Research Experiences," in *Proceedings of Charleston Library Conference* (Charleston Library Conference, Purdue e-Pubs, 2019), https://doi.org/10.5703/1288284317153.

[105] "Digital Scholarship Planning 2020 Webinar Series," Coalition for Networked Information (CNI), August 5, 2020, https://www.cni.org/events/cni-workshops/digital-scholarship-planning-2020-webinar-series.

[106] Liz Milewicz, "Supporting Humanities and Social Science Digital Research," https://www.cni.org/wp-content/uploads/2020/09/Milewicz-DSPlanning2020.pdf.

[107] Amy Koshoffer and Ted Baldwin, "Partnerships and Challenges for Sustainable Research & Data Services," https://www.cni.org/wp-content/uploads/2020/09/Koshoffer-dsp-2020.pdf.

"social interoperability" to help increase the institution's research-enabling capacity.[108] Libraries have been active in providing new services areas that require better coordination: research data management (RDM), research information management (RIM), research analytics, and ORCID adoption. Experiences from some successful cases suggested that although having quite different priorities, these research support partners could adopt some strategies to foster a new culture of collaboration, communication, and mutual understanding, including securing first buy-in, knowing your audience and speaking their language, offering concrete solutions to their problems, and getting the timing right.

Financial sustainability of the library's new roles and services is still very challenging though. The University of Maryland innovatively started a new digital data services program in 2015 that aimed to bring income and reputation to the library through making use of information technology expertise to serve both the internal academic units and external companies' data management, application development, and consultation needs.[109] Continuation of the program brings issues of balancing competitive priorities of the library, and even challenges the mission of the academic library to stay altruistic according to the nature of the profession.

Research Libraries UK recently announced "A manifesto for the digital shift in research libraries", with a 10-year timeline and an ambitious but clear goal of becoming "an integral part of the local and global acknowledgement environment" that will be implemented through capacity buildings in all four areas: skills, spaces, scholarship, and stakeholders.[110] A list of realistic needs are also being identified for the UK research Libraries to target upon, including changes in infrastructure, organizational structures, culture, and sustainable investment. It will be interesting to monitor the unique national level research libraries' collective efforts in supporting digital scholarship.

## Implications

- Academic libraries should consider restructuring their internal organization and building external partnerships to better integrate research support.
- Research support needs to be customized and flexible and consider disciplinary context.
- Research support needs to go beyond traditional resource discovery services, and instead needs to be extended to support researcher needs at all stages of the research life cycle,

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[108] Rebecca Bryant, Annette Dortmund, and Brian Lavoie, "Social Interoperability in Research Support: Cross-Campus Partnerships and the University Research Enterprise" (Dublin, OH: OCLC Research, 2020), https://doi.org/10.25333/wyrd-n586.

[109] Kate Dohe, Babak Hamidzadeh, and Ben Wallberg, "Doing More, With More: Academic Libraries, Digital Services, and Revenue Generation" (Ithaka S+R, January 24, 2019), https://doi.org/10.18665/sr.310917.

[110] Research Libraries UK, "Digital Shift Manifesto," Research Libraries UK, 2020, https://www.rluk.ac.uk/digital-shift-manifesto/.

including research workflow, data management and analysis, and dissemination of all kinds of scholarly products.

## Open Science and Research Data Services

Sensing the open trend of academia, commercial entities have quickly acquired and merged previously non-profit open projects and started to build and sell their extended new research support products to institutions. Some examples are Springer Nature's Open Research, ExLibris's Esploro, EBSCO's Research Output Workflows and Data Preservation, and Elsevier's Research Platforms.[111] At the same time, non-commercial open scholarship is facing serious sustainability challenges. Recent examinations of existing open science and open scholarship infrastructure have consistently identified these systems' vulnerabilities as lying with their mainly grant-funded models and their lack of viable business plans.[112]

In North America, despite the fact that academic libraries are investing, on average, over 2.5% of their budget towards open scholarship, further alignment with long term goals, clearer communication, and contextualized funding are in great need.[113] The recent successful fund sourcing for the Directory of Open Access Journals (DOAJ) project through The Global Sustainability Coalition for Open Science Services (SCOSS) is very encouraging.[114] Recently consolidated from a previous voluntary organization, Invest in Open Infrastructure is another dedicated effort to support the research institutions and communities that develop and sustain

[111] Springer Nature, "Open Research," accessed February 3, 2021, https://www.springernature.com/gp/open-research; Ex Libris, "Esploro Cloud-Based Research Information Management," Ex Libris, accessed February 3, 2021, https://exlibrisgroup.com/products/esploro-research-services-platform/; EBSCO, "Research Output Workflows & Data Preservation," EBSCO Information Services, Inc., accessed February 3, 2021, https://www.ebsco.com/products/research-output-workflows-data-preservation; Elsevier, "Research Platforms," accessed February 3, 2021, https://www.elsevier.com/research-platforms.

[112] Rebecca Kennison et al., "OA in the Open: Community Needs and Perspectives" (LIS Scholarship Archive, September 11, 2019), https://doi.org/10.31229/osf.io/g972d; Katherine Skinner, "Mapping the Scholarly Communication Landscape 2019 Census" (Atlanta, Georgia: Educopia Institute, 2019), https://educopia.org/wp-content/uploads/2019/06/Census2019_EducopiaPublications.pdf; Victoria Ficarra et al., "Scoping the Open Science Infrastructure Landscape in Europe" (Zenodo, October 30, 2020), https://doi.org/10.5281/zenodo.4159838.

[113] 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; Kathleen Shearer, "Investments in Open: Canadian Research Libraries' Financial Expenditures on Open Services, Staff, and Infrastructures in Support of Open Scholarship" (Canadian Association of Research Libraries, July 2020), https://peerj.com/articles/4375.

[114] Judy Ruttenberg, "How SCOSS Is Strengthening Global Open Access and Open Science Infrastructure," *Association of Research Libraries*, October 21, 2020, https://www.arl.org/blog/how-scoss-is-strengthening-global-open-access-and-open-science-infrastructure/; The Global Sustainability Coalition for Open Science Services (SCOSS), "What Is SCOSS?," accessed February 3, 2021, https://scoss.org/.

open technology or systems through evidence-based research and strategic decision-making process.[115]

At a global level, UNESCO continued its efforts in setting standards for open science by sending its first draft of UNESCO Recommendation on Open Science to its member nations and the public for consideration and input.[116] The document urges member states to take actions in multiple areas of promoting and supporting open science. The finalization of UNESCO's recommendation is expected to broadly influence national laws and practices on open science around the world.

Open science will not be a reality unless individual researchers are aware of its principles and are capable of performing its best practices in their own domain of knowledge production. European Union's Open Science Skills Working Group Report pointed out that the majority of researchers were unaware of the concept of open science and there is a general lack of training and support for them even though researchers agree that responsible management of data is crucial.[117] The most recent 2020 State of Open Data Report has revealed that with the accumulated efforts of pushing and supporting data sharing from publishers, funders, and institutions in recent years, more researchers started to spend time developing research data management plans (DMP) especially in countries where funder mandates and DMP tools coexist.[118] However, incentives and rewards of sharing data are still missing in the current research evaluation systems, and there are additional legitimate concerns of data misuse and quality issues among researchers, particularly with the recognition of inherent biases and inequalities in data algorithms and the current open systems. The CARE Principles for Indigenous Data Governance and the TRUST Principles for Digital Repositories are attempts to combat these biases.[119] Collaboratively developed by the global research data community and immediately adopted widely around the world, they attempt to guide researchers in the meaningful, ethical, and open sharing of data, and the selection of trustworthy platforms.

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[115] "Invest in Open Infrastructure," Invest in Open Infrastructure, accessed February 3, 2021, https://investinopen.org/.

[116] UNESCO, "UNESCO Recommendation on Open Science," Open Science, March 2, 2020, https://en.unesco.org/science-sustainable-future/open-science/recommendation.

[117] Working Group on Education and Skills under Open Science, "Providing Researchers with the Skills and Competencies They Need to Practise Open Science: Open Science Skills Working Group Report" (Luxembourg: Publications Office of the European Union, 2017), https://data.europa.eu/doi/10.2777/121253.

[118] Digital Science et al., "The State of Open Data 2020" (Digital Science, January 12, 2020), https://doi.org/10.6084/M9.FIGSHARE.13227875.

[119] Research Data Alliance International Indigenous Data Sovereignty Interest Group, "CARE Principles of Indigenous Data Governance," Global Indigenous Data Alliance, 2019, https://www.gida-global.org/care; Dawei Lin et al., "The TRUST Principles for Digital Repositories," *Scientific Data* 7, no. 1 (May 14, 2020), https://doi.org/10.1038/s41597-020-0486-7.

In the US, a web inventory research of 120 higher education institutions' research data services presented the necessity of a wider definition of research data services to include high performance computing, bioinformatics, statistics-focused services, and general research data management services.[120] This inventory study raised the awareness of additional opportunities to staff, fund, coordinate, and engage effective research data services at multiple levels of researchers' teaching and research ecosystems. Another recent report detailed key recommendations for several different research data stakeholders, including unique benefits for adoption in the context of their own perspectives.[121]

## *Implications*

- Research libraries need to develop their research support services under the new and broader definition of Open Science developed by UNESCO and participate in more inclusive and integrated efforts.
- Research libraries need to continuously evaluate and adjust their unique contribution areas within the Open Science and Open Scholarship ecosystem. Program development could be designed from both educational and infrastructural perspectives, based on local priority and capacity.
- Regional and national consortium, and even global initiatives are needed to address challenging Open Science infrastructure issues. Research libraries' existing regional, national, and international networks might be leveraged to strengthen the capacity of Open Science at multiple levels.
- Researchers and their professional organizations or societies, research support staff who are providing HPC and statistics services, and faculty members who are teaching Open Science/Open Data skills, are all important stakeholders that could become potential partners with research libraries when considering or developing Open Science or Open Scholarship programs on campus.

## Growth in Preprints

Preprint services have become increasingly popular in recent years, spreading to disciplines as diverse as earth sciences, psychology, and even library and information science. Founded in 1991, arXiv began as a preprint server for physics before expanding into astronomy, mathematics, computer science, and statistics. Its popularity and success have provided the

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[120] Jane Radecki and Rebecca Springer, "Research Data Services in US Higher Education" (Ithaka S+R, 2020), https://sr.ithaka.org/wp-content/uploads/2020/11/SR-Report-Research-Data-Services-US-Higher-Ed-111820.pdf.

[121] John Chodacki et al., "Implementing Effective Data Practices: Stakeholder Recommendations for Collaborative Research Support" (Washington, DC: Association of Research Libraries, September 2020), https://doi.org/10.29242/report.effectivedatapractices2020.

example for other disciplines to follow. While many fields have been slow to adopt preprints, there are now preprint services "for almost every discipline."[122] In fact, in a report providing a thorough overview of preprints and their future, Reiger notes that nearly 12 new preprint services were started in just the last year.[123] These preprint services include regional repositories like AfricArxiv and IndiaRxiv as well as disciplinary repositories like ChemRxiv, which launched in 2017, and medRxiv, which launched in 2019.[124] Many of these new preprint services are hosted on the OSF Preprints platform from the Center for Open Science, but major publishers have also embarked on preprint initiatives, developing or acquiring services such as Elsevier's SSRN, Taylor & Francis's F1000Research, and IEEE's TechRxiv.[125]

Preprints offer many benefits to researchers including rapid dissemination, open access, version control, the opportunity for informal feedback, and the establishment of priority claims.[126] Some preprint services like bioRxiv have also worked with publishers to make it easier to submit papers from the repository to their journals, and at least one open access journal will begin requiring authors to submit manuscripts to preprint servers in order to be considered for publication.[127] Conversely, several authors have commented on concerns about preprints and the potential for harm from unvetted content, especially in the health sciences.[128] As noted by Hoy, "Because they have not undergone the peer review process, there is a concern that making preprints broadly available could spread inaccurate information and lead to non-reviewed material being cited in other literature," as well as the concern that preprints contribute to information overload without "the natural filter created by traditional journal publishing."[129] To help alleviate concerns, recommendations have been developed for best practices for preprint

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[122] Matthew B. Hoy, "Rise of the Rxivs: How Preprint Servers Are Changing the Publishing Process," *Medical Reference Services Quarterly* 39, no. 1 (2020): 85, https://doi.org/10.1080/02763869.2020.1704597.

[123] Oya Y. Rieger, "Preprints in the Spotlight: Establishing Best Practices, Building Trust" (Ithaka S+R, May 27, 2020), https://doi.org/10.18665/sr.313288.

[124] François-Xavier Coudert, "The Rise of Preprints in Chemistry," *Nature Chemistry* 12, no. 6 (2020), https://doi.org/10.1038/s41557-020-0477-5; Hoy, "Rise of the Rxivs: How Preprint Servers Are Changing the Publishing Process."

[125] Rieger, "Preprints in the Spotlight."

[126] "All That's Fit to Preprint," *Nature Biotechnology* 38, no. 5 (2020), https://doi.org/10.1038/s41587-020-0536-x; Coudert, "The Rise of Preprints in Chemistry"; Hoy, "Rise of the Rxivs: How Preprint Servers Are Changing the Publishing Process."

[127] Richard Sever et al., "BioRxiv: The Preprint Server for Biology," preprint (Scientific Communication and Education, November 6, 2019), https://doi.org/10.1101/833400; Michael B. Eisen et al., "Implementing a 'Publish, Then Review' Model of Publishing," *ELife* 9 (December 1, 2020), https://doi.org/10.7554/eLife.64910.

[128] May C.I. Van Schalkwyk et al., "The Perils of Preprints," *The BMJ* 370 (2020), https://doi.org/10.1136/bmj.m3111; Kent R. Anderson, "BioRxiv: Trends and Analysis of Five Years of Preprints," *Learned Publishing* 33, no. 2 (April 2020), https://doi.org/10.1002/leap.1265.

[129] Hoy, "Rise of the Rxivs: How Preprint Servers Are Changing the Publishing Process," 86.

services around metadata standards, versioning approaches, engaging stakeholders, and bidirectional linking between preprints and published versions.[130]

Another concern is sustainability. ArXiv had to implement a collective funding model in 2010 to help cover its costs, and other preprint services have also struggled with this issue. Initially hosting preprints for free, OSF Preprints informed its preprint communities in 2018 that they would be instituting fees to cover their costs, prompting an outcry among these volunteer-led services. Some repositories will remain on the platform having found funding through grants or library partnerships, but others will have to cease or move.[131] EarthArxiv has already transferred its repository to the California Digital Library using the Janeway platform.[132]

While preprints had already been gaining in popularity, their growth has accelerated this year due to the COVID-19 pandemic. New preprints about the novel coronavirus grew from about 10 posts daily in February to "between 50 and 100 SARS-CoV-2-related posts daily" in April.[133] From January to May, nearly 3000 preprints on the topic were deposited in bioRxiv and medRvix.[134] The pandemic has highlighted the benefits of rapid dissemination of research in an emergency but has also amplified concerns about unvetted research. This has led preprint services "to enhance their usual screening procedures" to limit the spread of misinformation.[135] In addition, this growth inspired calls for "a rapid-review service for preprints of broad public interest" and led to the launch of Rapid Reviews: COVID-19 and Outbreak Science PREreview.[136]

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[130] Jeffrey Beck et al., "Building Trust in Preprints: Recommendations for Servers and Other Stakeholders," preprint (Open Science Framework, July 21, 2020), https://doi.org/10.31219/osf.io/8dn4w.

[131] Smriti Mallapaty, "Popular Preprint Servers Face Closure Because of Money Troubles," *Nature* 578, no. 7795 (2020), https://doi.org/10.1038/d41586-020-00363-3.

[132] Justin Gonder, "EarthArXiv Preprint Server Re-Launches on CDL-Hosted Janeway Platform," *California Digital Library*, October 1, 2020, https://cdlib.org/cdlinfo/2020/10/01/eartharxiv-preprint-server-re-launches-on-cdl-hosted-janeway-platform/.

[133] Kai Kupferschmidt, "Preprints Bring 'firehose' of Outbreak Data: COVID-19 Has Upended the Ways Researchers Share Findings and Collaborate," *Science* 367, no. 6481 (2020), https://doi.org/10.1126/science.367.6481.963; "All That's Fit to Preprint."

[134] Diana Kwon, "How Swamped Preprint Servers Are Blocking Bad Coronavirus Research," *Nature* 581, no. 7807 (2020): 130–31, https://doi.org/10.1038/d41586-020-01394-6.

[135] Kwon, "Swamped Preprint Servers," 130.

[136] Michael B. Eisen and Robert Tibshirani, "How to Identify Flawed Research Before It Becomes Dangerous," *The New York Times*, July 20, 2020, https://www.nytimes.com/2020/07/20/opinion/coronavirus-preprints.html; Lindsay McKenzie, "Debunking Bad COVID-19 Research," Inside Higher Ed, June 29, 2020, https://www.insidehighered.com/news/2020/06/29/new-mit-press-journal-debunk-bad-covid-19-research; Michael A. Johansson and Daniela Saderi, "Open Peer-Review Platform for COVID-19 Preprints," *Nature* 579, no. 7797 (2020), https://doi.org/10.1038/d41586-020-00613-4.

Preprints are likely to remain an essential part of the scholarly communications ecosystem for the foreseeable future. Even as peer-reviewed journals become more open access, there will still be a role for preprints because they speed up dissemination and establish precedence. The pandemic has highlighted the important role that they play in advancing research.

## *Implications*

- Librarians need to monitor discussions about sustainability and consider hosting or funding preprint services to support their continued growth.
- Librarians in all disciplines should promote the benefits of posting preprints to authors while also teaching students about the benefits and concerns surrounding preprints, noting that readers should think critically about all research—even in peer-reviewed journals.
- Librarians and library staff may want to set an example by posting their own LIS research to preprint services.

# Emerging Technologies

## Evolving Library Systems

In 2020, libraries have continued migrating from integrated library systems (ILS) to cloud-based library services platforms (LSP). Three major LSP products, Ex Libris Alma, OCLC WorldShare Management Services (WMS), and open source-based FOLIO have made significant progress.

Many large-scale library systems and consortia in both the US and Canada have joined Ex Libris, accelerating the development of the company's product and services, and strengthening its position as a leader in library systems solutions. In addition, the company has recently acquired Innovative Interfaces and RapidILL, further expanding its product line while reducing libraries' options in the library technology market.[137] Alma establishes the foundation for Ex Libris' existing systems and new products. At the same time, OCLC WMS is also increasing its number of installations among academic libraries, making Alma and WMS the two primary LMS options for academic libraries.[138]

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[137] Ex Libris, "Ex Libris Signs Definitive Agreement to Acquire Innovative," *Ex Libris*, December 5, 2019, https://exlibrisgroup.com/press-release/ex-libris-signs-definitive-agreement-to-acquire-innovative/; Ex Libris, "Ex Libris Acquires RapidILL, Provider of Leading Resource-Sharing Solutions," Cision PR Newswire, June 20, 2019, https://www.prnewswire.com/il/news-releases/ex-libris-acquires-rapidill-provider-of-leading-resource-sharing-solutions-300872121.html.

[138] Marshall Breeding, "2020 Library Systems Report," American Libraries Magazine, May 1, 2020, https://americanlibrariesmagazine.org/2020/05/01/2020-library-systems-report/.

Interest is growing in open source LMS options, with FOLIO being the top competitor. Academic libraries of varying sizes have already begun implementation. As a shared community, FOLIO provides the libraries the opportunity to work with other users and developers to create new functions and features integrating systems together to meet local needs.[139]

## Implications

- Many libraries that have migrated to LSPs can ethically and responsibly use their rich data troves, which can enhance the analysis functions for academic libraries and assist with learning, teaching, and research.
- Libraries can make use of and improve library workflows to take advantage of LMS tools, many of which have shared communities. This can provide the library an opportunity to work with developers to create new functions and features, and integrate systems together to meet local needs.

## Immersive (XR/VR/AR) Technologies

For a few decades now, colleges and universities have launched initiatives which seek to incorporate immersive technologies such as extended reality (XR), virtual reality (VR), and augmented reality (AR) into teaching and learning.[140] As these technologies emerge from setups as simple as Google Cardboard and a smartphone to more elaborate head-mounted displays (HMDs) and external sensors, and as they begin to more frequently incorporate artificial intelligence and machine learning capabilities, there has been a steady increase in academic inquiry into the potential of incorporating virtual environments into higher education across multiple disciplines.[141] Many companies are creating XR/VR/AR-based educational content, and the market for these technologies is expected to drastically increase in the near future.[142]

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[139] PR Newswire, "FOLIO Libraries Announcing Implementations and Timelines as the Open Source Library Platform Nears Significant Milestone," Markets Insider, July 13, 2020, https://markets.businessinsider.com/news/stocks/folio-libraries-announcing-implementations-and-timelines-as-the-open-source-library-platform-nears-significant-milestone-1029388302.

[140] Malcolm Brown et al., *2020 EDUCAUSE Horizon Report: Teaching and Learning Edition* (Louisville, CO: EDUCAUSE, 2020), https://www.educause.edu/horizon-report-2020.

[141] Jaziar Radianti et al., "A Systematic Review of Immersive Virtual Reality Applications for Higher Education: Design Elements, Lessons Learned, and Research Agenda," *Computers & Education* 147 (April 1, 2020), https://doi.org/10.1016/j.compedu.2019.103778.

[142] Aaron Burch, "The Top 10 Companies Working On Education In Virtual Reality and Augmented Reality [REBOOTED]," *Touchstone Research*, April 9, 2019, https://touchstoneresearch.com/the-top-10-companies-working-on-education-in-virtual-reality-and-augmented-reality-rebooted/; Business Wire, "Global Augmented Reality (AR) and Virtual Reality (VR) Market Research Report 2020," Business Wire, November 27, 2020, https://www.businesswire.com/news/home/20201127005538/en/Global-Augmented-Reality-AR-and-Virtual-Reality-VR-Market-Research-Report-2020---ResearchAndMarkets.com.

Several studies have examined the relationship between student engagement and learning outcomes. This association has been noted to have a higher dependency on virtual learning environments (VLEs) in science-based subjects.[143] A recent, federally-funded study suggests that virtual-environment-based tools enhance a student's ability to retain information and better apply what they have learned when using them.[144] In terms of acquiring "twenty-first century skills," immersive teaching and learning tools can improve digital literacy, collaboration, creative thinking, and problem-solving abilities.[145] One major research university noted a lack in soft skills in their science, technology, engineering, and math (STEM) graduates, so they developed VR simulations to immerse students in intercultural leadership scenarios that could not be replicated in a traditional classroom.[146]

Students' perceptions of the benefits of immersive technologies tends to be positive, but one recent study suggests that educators need to further explore whether integration of these tools is appropriate for their curriculum and pedagogical approach.[147] While some studies have found HMDs useful in skills acquisition, another review of the literature found the devices to have no advantage or even proved counterproductive because the immersive experience distracted from the learning task at hand.[148] As exploration in immersive learning increases, a sound conceptual framework for course and content design may need to be developed for those in higher education utilizing VR and AR tools and applications.[149]

As the perceived academic benefits grow and the technology becomes more accessible, research libraries are increasingly incorporating XR/VR/AR into their collaborative spaces, and into their

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[143] Chris A. Boulton, Carmel Kent, and Hywel T. P. Williams, "Virtual Learning Environment Engagement and Learning Outcomes at a 'Bricks-and-Mortar' University," *Computers & Education* 126 (November 1, 2018), https://doi.org/10.1016/j.compedu.2018.06.031.

[144] Eric Krokos, Catherine Plaisant, and Amitabh Varshney, "Virtual Memory Palaces: Immersion Aids Recall," *Virtual Reality* 23, no. 1 (March 1, 2019), https://doi.org/10.1007/s10055-018-0346-3.

[145] George Papanastasiou et al., "Virtual and Augmented Reality Effects on K-12, Higher and Tertiary Education Students' Twenty-First Century Skills," *Virtual Reality* 23, no. 4 (December 2019), https://doi.org/10.1007/s10055-018-0363-2.

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[149] Patricia Steele et al., "Studio Thinking Framework in Higher Education: Exploring Options for Shaping Immersive Experiences Across Virtual Reality/Augmented Reality Curricula," *Journal of Educational Technology Systems* 48, no. 3 (March 2020), https://doi.org/10.1177/0047239519884897.

collections and services.[150] Costs and sustainability issues associated with immersive technologies have led several academic libraries to hold multiple national forums where they address questions surrounding implementation, curriculum development, access, and sharing of best practices.[151] Future opportunities exist for college and university libraries to work closely with teaching and research faculty in building a repository of VR and AR digital files to support various curricula.[152]

## *Implications*

- Libraries should stay up-to-date on new developments in XR/VR/AR technologies, and work to collaborate with campus partners to support implementation of useful applications.
- Academic libraries should create collaborative spaces for the accommodation and incorporation of immersive technologies in a library setting where appropriate based on curriculum.
- Librarians should look to supplement instruction with classroom practices and examples that promote immersive technologies, and should provide development opportunities for faculty and staff to do so.
- Navigation AR/VR with hand tracking social experience provides libraries with an opportunity to display their archive and collection via three-dimensional sight and enhance accessibility of digital media.

# Conclusion

Higher education is not well known for swift change, but this past year forced many institutions to adapt at a rapid pace. The COVID-19 pandemic has led to decreased budgets and other uncertainties around funding, and has also severely impacted many students' financial situations. Prior to the pandemic, falling budgets had been forcing many libraries to reevaluate their subscriptions, and, for many, this calculus has only been exacerbated by the economic downturn. In addition, the sudden shift to remote learning threw into sharp perspective some serious issues surrounding access to resources, particularly with controlled digital lending and use of open

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[150] Ken Fujiuchi and Joseph Riggie, "Academic Library Collections in the Age of Extended Reality (XR)," *Collection Management* 44, no. 2–4 (July 3, 2019), https://doi.org/10.1080/01462679.2019.1566109; Jeremy A. Blot et al., *3D/VR in the Academic Library: Emerging Practices and Trends*, ed. Jennifer Grayburn et al. (Council on Library and Information Resources, 2019), https://www.clir.org/wp-content/uploads/sites/6/2019/02/Pub-176.pdf.

[151] Matt Cook et al., "Challenges and Strategies for Educational Virtual Reality: Results of an Expert-Led Forum on 3D/VR Technologies across Academic Institutions," *Information Technology & Libraries* 38, no. 4 (December 2019), https://doi.org/10.6017/ITAL.V38I4.11075.

[152] Matthew Hannah, Sarah Huber, and Sorin Adam Matei, "Collecting Virtual and Augmented Reality in the Twenty-First Century Library," *Collection Management* 44, no. 2–4 (July 3, 2019), https://doi.org/10.1080/01462679.2019.1587673.

educational resources. Questions of accessibility were also prevalent, especially related to instruction.

Social issues also sprang to the forefront, with many institutions struggling to respond in an appropriate and timely fashion to the many protests that erupted in 2020 and early 2021, and the social injustices and misinformation that fed and surrounded them. Diversity, equity, and inclusion will be central to discussions and actions in HE in the coming months and years, and meaningful action should be undertaken to combat any and all inequities. Part of this action should ideally include more interdisciplinary collaboration with incorporating critical theory practice and metaliteracy throughout HE curricula and programs.

We are also seeing more opportunity for expansion of research support and services within and across libraries, as well as the development of new technologies to support these and other library operations. With renewed focus on both open research and analytic tools, libraries are in a good position to help shape the conversations and policies surrounding these topics.

# Appendix: ACRL Research Planning and Review Committee, 2020-2021

Ginny Boehme (chair)
Science Librarian
Miami University

Alex McAllister (vice-chair)
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Michael Flierl
Information Literacy and Research Engagement Librarian
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University of Louisville Libraries

Cindy Li
Head of Emerging Technologies & Systems
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Brian Quigley
Head, Engineering & Physical Sciences Division
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Minglu Wang
Research Data Management Librarian
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Andrew Wesolek
Director of Digital Scholarship and Communications
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