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COVID-19 Impacts on Electronic Resource Usage at a Regional University

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ABSTRACT

An analysis of electronic resource usage at a regional university in the southeast during the COVID-19 pandemic showed interesting results. While it was anticipated that movement to online instruction would increase usage of electronic resources, it was discovered that overall usage actually declined for those resources. Virtual reference transactions, however, increased during the pandemic. When measuring downloads of full-text of both journals and e-Books in the health sciences, humanities, social sciences, and physical sciences, it was discovered that the first three subject areas showed a double digit percentage decline in use, with only the physical sciences showing a decline of less than ten percent.

KEYWORDS

database usage, virtual reference, pandemic, e-Books

INTRODUCTION

Auburn University at Montgomery (AUM) is a regional institution located in Montgomery, Alabama. The University is part of the Auburn University system but is separately accredited by the Southern Association of Colleges and Schools. The University offers bachelors and master's degree programs in 32 separate areas, a joint doctoral degree program in Public Administration with Auburn University, and a doctoral program in Nursing. In the fall of 2019, AUM had a student enrollment of 5,188 students. Of these, 4,523 were undergraduates, and 665 were graduate students (Auburn University at Montgomery, 2019).

During the winter months of 2020, the growing impact of the COVID-19 virus became prevalent. On March 16, the University moved to limit staffing in most areas (Auburn University at Montgomery, 2020, March 16) and later announced that course delivery would be remote for the remaining part of spring semester (Auburn University at Montgomery, 2020, March 20). The AUM Library was reduced to minimal staffing and services for students and faculty, and all instruction was moved online. Faculty members had only one week in spring of 2020 to prepare their instruction sessions for online only. Assignments had to be re-written and, where access to print library resources was required, revised to utilize other resources. Beginning April 1, 2020, the Library was closed and staff who could work from home did so. On May 11, 2020, the Library was re-opened for the summer session (Auburn University at Montgomery, 2020, May 14) though instruction remained primarily online. The Library had reduced seating, tables divided by plexiglass, and all individuals entering were required to wear a mask. If the individual lacked a mask, the Library provided one. In an announcement from the Chancellor on March 17, 2020, campus learned operations for the summer and fall of 2020 would be face to face or hybrid, depending upon class circumstances (Auburn University at Montgomery, 2020, March 17). On July 6, 2020, staggered work schedules were established and the Library was re-opened. For the next eight months, staggered work schedules remained in place before the return of all staff on March 22, 2021. Prior to the staff returning to full-time in person work, the University provided the Pfizer vaccines to all interested employees.

During the period librarians and library staff worked from home, close attention was paid to database usage. It was anticipated that during the upcoming budget year (October 1 through September 30) reductions would need to be made in order to cope with inflation and a possible reduction in funding. An additional issue was what effect moving instruction completely online would have for library resources. Obviously print circulation would be down, but what else?

LITERATURE REVIEW

A number of articles have been published on the effects on library services caused by COVID-19 restrictions. Pokorna, Indrak, Grman, Stepanovsky, and Smetankova (2020) noted the impact of the growing popularity of digital access to resources as well as the increasing need for fully digital collections to support the ongoing research need for the campuses in the Czech Republic. A report from the American Library Association noted the survey developed by Hinchliffe and Wolff-Eisenberg (2020) that observed that reference services in academic libraries pivoted to online or by phone. Access to print collections meanwhile declined (American Library Association, 2021). Because of library closings with staff working remotely, access to print materials was necessarily impacted. Reference services saw a significant growth relying on chat sessions or zoom interactions with patrons. Library instruction sessions were also impacted by being forced into both synchronous and asynchronous learning sessions. The impact of COVID-19 and the rapid change-over for universities to distance learning effected the acquisition of materials, as more emphasis was placed on electronic resources to provide students and faculty with access to resources in support of teaching and research. MacDonald (2020) reported that the Northwestern State University Library provided electronic access to digital collections and e-resources. Northwestern State also maintained virtual services such as LibGuides, tutorials, FAQ's, and email assistance, all of which were already offered for off-campus and distance learning requirements.

Some of the changes taking place in moving primarily to a digital platform during the pandemic were disruptive. Ajibade and Mutula (2021) described virtual learning as a disruptive service. They articulated the need that virtual learning technologies offer a method to bridge the gap between traditional services impacted by library closures and services such as Zoom and Microsoft Teams to engage users and deliver content. With libraries facing the need to make more resources available in a digital format for users, a number of publishers made resources related to COVID-19 freely available. Distributors included HathiTrust and, briefly, the Internet Archive through its National Emergency Library program. At Auburn University at Montgomery, the Library provided access to open resources from the following vendors: BMJ Open, Cambridge University Press, Elsevier, the Journal of the American Medical Association, Lancet, New England Journal of Medicine, Oxford University Press, Public Library of Science, Sage, Springer Nature, SSRN (Preprints), and Wiley. For a complete list of open access resources see the research guide by *infoDOCKET*.

The practice of providing information on the pandemic from open access publishers was consistent with efforts of other regional universities. As described by Huffman (2020), the University of Wisconsin-Stevens Point Library reviewed the limited time offerings from vendors and began providing access to resources including Annual Reviews, Bloomsbury Digital Resources, and EBSCO's Academic Search Ultimate and Business Source Ultimate. As noted by Levine-Clark and Emery (2020) in their editorial introduction to volume 12 of *Collaborative Librarianship*, the closing of access to resources still required work go on, but in a collaborative fashion. Fudrow, McAllister-Erickson, and Collister (2020) described a process at the University of Pittsburgh where theses and dissertations underwent a revamped process whereby approval forms were upgraded to signed digital forms. The creation and standardization of metadata for the documents involved, not only those in the technical services area of the Library, but also partners outside of the Library. As noted by Rand and Shepard (2020), with the outbreak of COVID-19 "the educational landscape of the university shifted from one based on face-to-face connection to one driven solely by remote connectivity" (p. 59). A big component of this involved internal communication within the Library. Where before if one had a question, a quick office visit might solve the issue. With COVID-19 and restrictions on staffing in the building, librarians and library staff utilized Zoom calls and interactions on the SpringShare LibChat platform.

HathiTrust aided libraries in providing Emergency Temporary Access Service (ETAS) to support Trust members' research, teaching, and learning by providing access to in-copyrighted works held in library print collections. This was on a temporary basis as described by Fulkerson, McIntyre, and Stewart (2020). As explained by HathiTrust Director Mike Furlough in the ETAS announcement of May 22, 2020, the Trust was providing service to 171 campuses in the United States and Canada. As noted by Furlough, HathiTrust "intends to provide the service where print collection access continues to be sub-

stantially disrupted due to public health issues” (HathiTrust Digital Library, 2020, para. 3). The notice continues on to state that there were no plans for continued access to the digital copies of members’ collections once the pandemic eased. For Libraries that are members of HathiTrust, the digital access is a great support for students, faculty, and staff engaged in research and instruction. For libraries that are not members, the transition to digital only access increased pressure on medium sized and smaller institutions to expend more funds for digital materials – both e-Books and journals.

As noted in the article by Walsh and Rana (2020), one of the impacts of closing libraries led to interactions between the collection development staff and interlibrary loan. At AUM, faculty and students would contact the ILL staff asking for a specific title, and ILL would contact the Collection Development Librarian to try to locate an electronic version of the title. Though the closing occurred in spring semester for AUM, this was six months into the fiscal year, and many expenditure commitments were in place. The AUM Library utilizes GOBI for its notification practice and for ordering. When new title announcement slips are sent out, faculty could request books in an electronic format. Only a few faculty members took advantage of this option, though the new Social Work major on campus was a frequent requestor for digital copies of works.

Primary Research Group (2021) conducted an international survey of research university faculty to measure the impacts of the pandemic on use of the academic library. The survey included 127 faculty at 53 universities in the United States, the United Kingdom, Australia, Canada, New Zealand, and Ireland. The survey results noted that 48.42% of faculty did not change the use of e-Books during the pandemic. One third of the faculty (34.65%) used e-Books more, and 12.60% used e-Books much more during the COVID-19 pandemic (Primary Research Group, Inc., 2021). Survey data indicate that humanities faculty had the largest increase in e-Book usage at 34.62%, followed by social sciences faculty with a 38.71% increase. Faculty in the mathematics and engineering fields had more than one-half of the faculty (56.67%) indicating no increase, while 40% of the faculty indicated using e-Books more than the past. Physical sciences faculty indicated they were more likely to maintain their e-Book usage at 60%, though slightly more than a quarter (27.5%) identified as using e-Books more, and 12.5% claimed more usage.

Database usage for faculty at research universities showed little impact from the pandemic. According to the Primary Research Group (2021) survey, two-thirds of faculty (67.72%) reported no changes in their use of databases. Analyzing by discipline, the survey found that humanities faculty maintained their usage of databases at 46.15%. A total of 23.08% of humanities faculty increased their usage of databases, and 19.23% indicated a significant increase in databases. A total of 3.85% of the faculty in the humanities reported less usage of databases. Faculty in the physical sciences reported 20% using databases more during the pandemic, and 10% indicated a significant increase in database usage. Social sciences faculty reported 19.35% more usage of databases, and 3.23% indicated greater usage of databases. An equal 3.23% reported less use of databases. Faculty in mathematics and engineering maintained database usage at 80%, with 13.33% reported more usage and 6.67% reporting much more usage (Primary Research Group, Inc, 2021).

The above figures differ somewhat from Hendl’s (2020) article, which indicated that over one-half (60%) of the respondents to a survey of faculty on Kuwait University’s use of electronic resources did not use those resources during the pandemic. In the study, 40% of the faculty reported using electronic resources, consisting of databases, e-Books, streaming videos, etc. When analyzing usage based upon source, Hendl (2020) described the faculty as using 80% databases, 67.5% e-journals, 40% subscribed journals, 37.5% e-Books, 17.5% open access journals, 12.5%, university theses and dissertations, and 10% videos.

DISCUSSION

AUM Database Usage

The Library analyzed its usage data for resources, consisting of books, e-Books, databases, and videos for the period when the University began the campus lockdown in March 2020 through the following March, when the University fully re-opened. In analyzing database usage, the databases were assigned to four discipline areas: humanities, social sciences, physical sciences, and health sciences.

Table 1

AUM Database Usage, March 2019-February 2020 and March 2020-February 2021

Discipline Area	Full-Text Retrieved 2019-2020	Full-Text Retrieved 2020-2021	% Change
Health Sciences	6,882	5,439	-20.90%
Humanities	6,587	5,861	-11.00%
Social Sciences	38,586	31,934	-17.20%
Physical Sciences	14,109	12,753	-9.60%
Total	66,164	55,987	-15.30%

Note. The retrieval time period is based upon a calendar year running from March of the year through February of the following year.

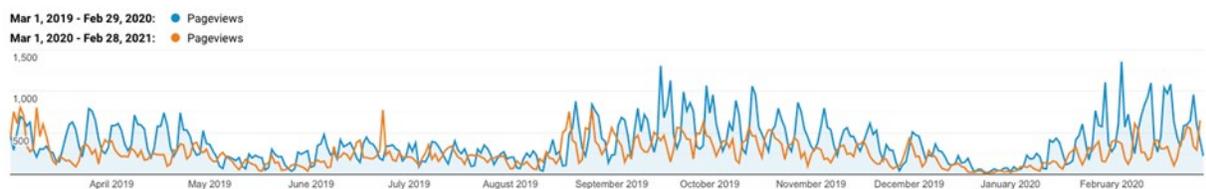
In contrast to the survey data from Primary Research Group (2021) and Henda’s (2020) survey of faculty at Kuwait University, the AUM Library saw a significant drop in database usage in all areas, ranging from -9.60% in the physical sciences to -20.90% in the health sciences. There are a number of possible reasons for such significant declines. First, faculty only had one week to change their courses over from face to face to online only. In doing so, some faculty significantly revised their assignments to require less research and writing from their students. While University dorm rooms remained operational, almost everyone who could go home did. For those attending classes virtually, connectivity in rural areas of Alabama is problematic. As noted by the FCC in the 2018 Broadband Deployment Report, “With respect to fixed 25 Mbps/3 Mbps and 10 Mbps/3 Mbps LTE services, 85.3% of all Americans have access to such services, including 61% in evaluated rural areas and 89.8% in evaluated urban areas” (Federal Communications Commission, 2018, bullet point 7). Forty-five percent of Alabamians live in rural areas (University of Alabama, Culverhouse College of Business, Center for Business and Economic Research, 2019, para. 13), which means that their access to acceptable levels of service is very much reduced as compared to their urban/suburban counterparts. Per Auburn University at Montgomery’s Common Dataset (2019), only 6% of undergraduate students at AUM are from out-of-state and more than 2,000 (over 50% of the full time undergraduate population) applied for need-based aid. Given these statistics, it seems probable that a large portion of the student body lacks access at home to proper broadband, especially given the overall state of access in Alabama. BroadbandNow describes the situation in Alabama:

“The state of Alabama currently ranks 38th in the US in the field of state broadband access. While the northern and east-central parts of Alabama, as well as the southwest tip of the state, are relatively well-connected, there remain a number of counties with low broadband coverage. One county’s population even has less than 1% access to a wired connection capable of 25 Mbps speeds” (BroadbandNow, 2021, para.1)

As shown in Figure 1, the Library’s website saw a similar overall pattern of use the prior year. The noticeably lower numbers further suggest that students may have had connectivity issues during the period. Recognition by the faculty of connectivity issues may have influenced the decline in research and writing assignments.

Figure 1

Library Website Usage Comparison



Virtual Reference Services

The Library had been focusing on chat and email services since 2016. The Library utilizes Springshare’s LibChat program, which reports data including the number of sessions, patron type, and includes transcripts of questions asked and answers given. During the period from March 2019 through February 2020, the Library provided 588 virtual reference transactions with AUM students, faculty and staff. During the COVID-19 pandemic from March 2020 through February 2021, the Library provided 683 virtual reference transactions; a 16% increase. These transactions occurred during a period when most of the service was provided while staff were working from home. A comparison of the data pre- and post COVID-19 restrictions is provided in the figures below.

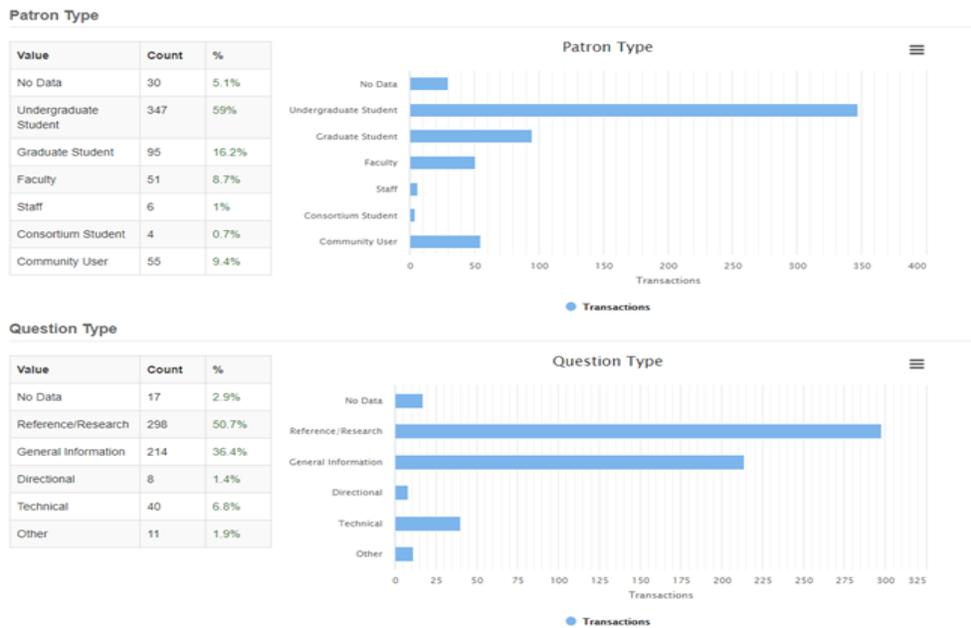
FIGURE 2
Virtual Reference Transactions, March 2019-Feb 2020



FIGURE 3
Virtual Reference Transactions, March 2020-February 2021

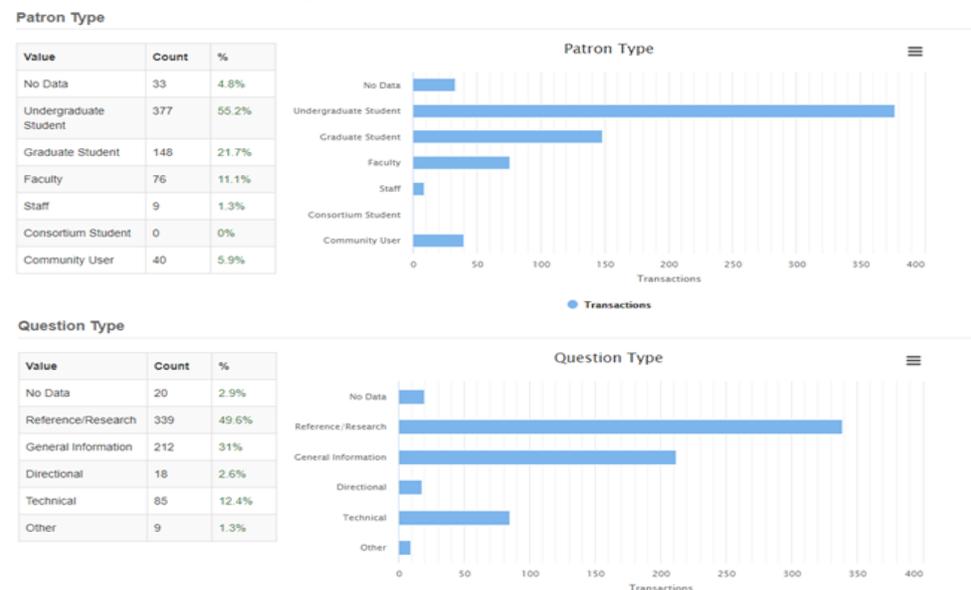


FIGURE 4
Patron Classification by Type, March 2019-February 2020



For the pre-COVID-19 period, undergraduates made the heaviest use of virtual reference services, equaling 59% of the total usage. Graduate students equaled 16.2% and faculty equaled 8.7%. During the COVID-19 period, with online classes and remote learning options in place, usage of the virtual reference services was similar to those from 2019-2020. A brief examination of the virtual reference and chat transactions revealed students were trying to find information on specific subjects. Students also needed access to articles that they were unable to locate in full-text. These are often found in the Library’s discovery service and students are informed how to access the full-text.

FIGURE 5
Patron Classification by Type, March 2020-February 2021



As the figure indicates, usage was fairly similar overall. Undergraduate usage was 55.2%, graduate usage was higher at 21.7%, and faculty usage rose to 11.1%. Questions identified by type were also

similar, though reference questions slightly declined, from 50.7% during 2019-2020 to 49.6% during 2020-2021. These questions involved greater assistance in aiding users on how to conduct their searches for improving their results, or for more detailed assistance at the topical level. General information questions, such as library hours or policies, fell to 31% in 2020-2021 from 36.4% in 2019-2020. This the authors ascribe to notices placed on the University web pages identifying limited access to campus facilities.

e-Book Usage

During the closure of the Library to in-person access, the usage of e-Books in comparison with print circulation was compared. The Library maintained a retrieval system whereby patrons could request materials and pick them up from the Dean. The same four subject areas as the databases were used.

TABLE 2

AUM e-Book Usage, April 2019-March 2020 and April 2020-March 2021

Discipline Area	E-Books Accessed 2019-2020	E-Books Accessed 2020-2021	% Change
Health Sciences	170	105	-38.20%
Humanities	934	896	-4.00%
Social Sciences	934	498	-46.60%
Physical Sciences	269	124	-53.90%
Total	2,307	1,623	-29.60%

Note. The dates of coverage were limited by the availability of data retained by the vendor.

The data show declines similar to those encountered in the journals area. For e-Books, humanities showed a relatively consistent use, declining only 4% in 2021 from 2020. Declines for the year for health sciences were 38.20%, social sciences 46.60%, and physical sciences 53.90%. The average decline overall was 29.60% for 2021 from 2020. The significance of the declines may align with change in curricula to emphasize a move away from significant research papers to shorter essay assignments. To measure the impact of COVID-19 on use of library materials, an examination was made of the print circulation from 2019-2020 versus the 2020-2021 pandemic year when the borrowing of materials greatly decreased. Table three shows use differences in print circulation compared between the years.

TABLE 3

Comparison of AUM Print Circulation, April 2019-March 2020 and April 2020-March 2021

Discipline Area	Print Circulations 2019- 2020	Print Circulations 2020-2021	% Change
Health Sciences	88	65	-26.10%
Humanities	1,967	851	-56.70%
Social Sciences	1,035	382	-63.00%
Physical Sciences	205	38	-81.40%
Total	3,295	1,336	-59.40%

Note. The circulation periods covered were the same as Table 2. These dates were chosen to provide consistency in the data.

As indicated by the figure, circulation of print materials fell by almost 60% during the pandemic.

Interestingly enough, the area that had the smallest decline, health sciences, showed only a 26.10% decrease in print circulations. In order to attempt to confirm an overall decline in usage, the authors examined the decline of all materials by subject field to determine the significance of the lack of collection usage.

TABLE 4

Overall Collection Usage by Discipline Field, April 2019-March 2020 and April 2020-March 2021

Subject Discipline	2019-2020 Journals	2020-2021 Journals	2019-2020 E-Books	2020-2021 E-Books	2019-2020 Print	2020-2021 Print	Total Usage 2019-2020	Total Usage 2020-2021	% Change
Health	6,882	5,439	170	105	88	65	7,140	5,609	-21.40%
Humanities	6,587	5,861	934	896	1,967	851	9,488	7,608	-19.80%
Social	38,586	31,934	934	498	1,035	382	39,902	32,814	-17.70%
Physical	14,109	12,753	269	124	205	38	14,583	12,915	-11.40%
Total	66,164	55,987	2,307	1,623	3,295	1,336	71,766	58,946	-17.80%

The data confirm a decline of nearly 18% overall in the use of library materials, as measured by full-text retrieval, e-book accesses, and print circulation. The heavy reliance on journal articles in fields such as the hard sciences mitigated the decline with physical sciences only showing an 11.40% decrease overall. The significant impact of nearly 20% in the humanities is reflected by the change in course assignments. Instructors limited the requirements for research papers in favor of shorter comparison and contrast papers and essays.

CONCLUSION

After examining data usage, it is clear that at AUM Library, overall usage was significantly impacted by the pandemic. Both electronic access and physical circulations were down. The double-digit declines were universal across the disciplines, though dependent upon the type of materials being requested. For example, the decline in e-Book usage for the humanities was 4%, while the decline in print circulations was 56.70%. The factors impacting the decline in practically all areas included the period during which the Library was physically closed, the loss of international students who were not able to make it back on campus before flights from various countries were impacted, and poor access to internet communications for those students who did not live on campus but were still enrolled.

For regional universities such as Auburn University at Montgomery, the pandemic has had an impact on the way courses are taught. Larger institutions within the state have re-dedicated their efforts to provide additional scholarships and other resources to recruit students. Whether this will have a long-term impact on enrollment remains to be seen. On the positive side, the AUM Library was able to ensure continued access to resources and strengthened its reference outreach using chat services.

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