

An Examination of Academic Library Platforms and Systems during COVID-19

Cole Hudson and Paul Gallagher

ABSTRACT

This paper examines the use and subsequent trajectory of academic library technologies due to the impact of the COVID-19 pandemic. Taking a broad view of technologies, the systems and services discussed will center around resource use because COVID restrictions shuttered many in-person technologies. The two academic libraries compared in this study show a similar pattern of use and signal growth of certain platforms and technologies for the future.

INTRODUCTION

The COVID-19 pandemic had a profound effect upon how libraries operated. With hours restricted, staffing curtailed, and a general movement toward an almost exclusively online service model, the usual host of services, resources, and technologies that libraries provide had to be altered in a matter of weeks. The impact of those changes, however hastily made, have been felt for years. With the pandemic changing to a seasonal endemic, there is now a moment to assess how COVID-19 changed the trajectory of library services. Looking at two academic libraries, each in different regions of the United States—the University of Arkansas (South) and Western Michigan University (Midwest)—the authors were curious to plot the future of library technology use post-pandemic. Although shown mostly through a lens of online resource use, there is a larger story to be told around library technological endeavors: harnessing existing systems, creating new ones, and shuttering others. The lack of traditional, in-person services shifted much of the technology use and services to online venues, and accordingly, many of the metrics surveyed within the institutions showed this trend.

This project reviews the changes of library use during the COVID-19 closures for two institutions, Western Michigan University (WMU), and University of Arkansas, Fayetteville (UARK). Although the two institutions vary in size (medium to large student populations), both are doctoral granting institutions with substantial research activity (according to Carnegie classification), offer a comparable range of library services, and experienced similar COVID-19 campus closures (in both duration and type of closure). With such similar profiles, it was worth understanding if their few differences, such as regional locations, revealed many variances in library use. Based on a previous study conducted by Connell, Wallis, Comeaux titled “The Impact of Covid-19 on the Use of Academic Library Resources,” this work expands that effort with an additional year of data for the institutions to address questions about the return of service levels as pandemic conditions changed into the second year.¹ While both institutions have differences, and there are some considerations with variations in the time periods, both institutions see some similarity of use across numerous categories.

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KEY FINDINGS

- Both institutions saw significant declines in use during the pandemic period, with a partial recovery during the third measured period (FY2021–2022) for most measured services.
- Some services saw growth during the pandemic period, such as use of institutional repositories and initial use of article and databases lists.
- Variances at WMU have a more pronounced trend of decline and recovery, where UARK presents a more complex picture of use during pandemic conditions.

BACKGROUND

Western Michigan University is a public, state university located in Kalamazoo, Michigan. WMU has an FTE of 15,890, is the fourth largest doctoral degree granting institution in Michigan and is classified by the Carnegie Foundation as a “High Research Activity” R2 institution. It has two libraries and a dedicated archival facility, containing more than 1.5 million volumes and approximately 30 FTE staff and 26 FTE faculty.²

During the pandemic, WMU moved to solely online learning in March 2020 and continued this way until fall 2021, when the campus was reopened but with significant COVID restrictions and many courses in a hybrid format. From March 2020 until late August 2020, all the campus was effectively closed except for essential services, although several thousand students remained in campus housing during this time. The physical library was closed from March 2020 until August 2020 and then reopened in phases, initially for material pick-up and then for limited occupancy. Campus staff worked remotely during this time and predominantly remotely from August through the 2020–2021 academic year, finally concluding with a larger return in August 2022.

Despite the reduction in onsite services, WMU continued to support campus needs, moving to virtual appointments and providing greater email and chat assistance. Physical materials continued to circulate via “mail to home” and later pickup services, and all electronic services were online without disruption.

The University of Arkansas is a public, land-grant university located in Fayetteville, Arkansas. It has a student FTE of more than 30,000 and serves as the flagship of the University of Arkansas System.³ The university is classified by the Carnegie Foundation as having “Very High Research Activity.” It has four libraries on its campus and houses more than 3.7 million volumes, with approximately 120 FTE staff and faculty.⁴

UARK switched coursework to online during the beginning of the pandemic, March 2020. It closed physical access to its libraries during March 2020, with library staff moving to remote work. The libraries reopened in July 2020 to limited staff—mostly those facilitating material retrieval and checkout. Buildings were reopened to the university community in fall 2020. During that time, library access was limited to the students, and occupancy was closely monitored. Most library staff remained remote, as did many of the campus community during the height of the pandemic. Staff returned to campus during the summer of 2021, as campus returned to normal operations for the start of the fall 2022 semester.

LITERATURE REVIEW

Assumptions around Library Resource Use

For many pre-pandemic academic libraries, the path was clear: online platforms (catalogs, discovery layers, resource sharing, etc.) were on the upswell. When the COVID-19 pandemic appeared, it was assumed by many that online library services would increase accordingly.⁵ Sharda and Bajpai, in a report studying the use of Google Classroom, noted strong use of the platform by librarians to provide resources and services while physical library access remained limited.⁶ Others mentioned a substantial use of electronic resources from their library subscriptions during the initial COVID lockdown.⁷ Similarly, some institutions reported a high rate of success switching to using their own institutional repositories as proxy for in-person activities such as student symposiums.⁸

The realities of usage during and, especially, post-pandemic seemed to paint a different picture, at least for some. As Connell, Wallis, and Comeaux noted, “the discovery tools/catalogs and major databases decreased during the COVID time frame,” and they were left wondering if use would improve or continue its downward trend.⁹

Technology Development

Novel technology development and adoption was a necessity in light of the constraints COVID-19 placed around physical proximity. Research around sanitation technology and telepresence systems were among consideration by libraries.¹⁰ Some developed chatbot systems to handle growing reference needs, while others created temporary platforms to handle limited controlled digital lending.¹¹ North Carolina State University Libraries’ Temporary Access to Chapters Online (TACO) system allowed mediated viewing of textbooks when physical access was constrained.¹² HathiTrust started their Emergency Temporary Access Service, providing access to library-owned materials using digital surrogates.¹³ Others harnessed well-established technologies such as Springshare’s LibGuides platform to support students during COVID lockdowns.¹⁴ Neither of the investigators’ institutions engaged in developing new technologies, but rather leveraged existing systems around virtual reference, research guides, and discovery systems.

Internet Use and Access in United States

Looking further into the ability of potential users to access libraries during COVID, we can see a more complicated picture. At a surface level, studies point to an ever-increasingly online population in the United States. According to Pew Research, use of internet among American adults had steadily increased since pre-pandemic times, going from 89% in 2018 to over 93% in 2021. Use by 18–29-year-olds was near universal (99% in 2021, moving from 98% in 2018) as well as for college grads (97% in 2018 and 98% in 2021). There was a bit more growth for those who report some college education (93% in 2018 to 97% in 2021). Both compose a key demographic for academic library users, as either university students or employees, and seem to point to a population ready to transition into a technology-heavy education environment.

However, surveys measuring access to broadband at home show a different perspective during a time of online instruction and remote work policies. 77% of American adults reported having broadband internet in their homes in 2021 (up from 65% in 2018), showing a significant lag in many households’ ability to attend video conference calls or streaming bandwidth-intensive instructional sessions. Home broadband use according to education and age varied widely. In 2021, only 70% of 18–29-year-olds reported access to broadband, while 94% of college grads and 80% of respondents with some college education were served by broadband internet at home.¹⁵

METHODOLOGY

To determine the impact of COVID-19 pandemic conditions both during the quarantine and immediately after pandemic, data from years immediately previous, during, and to the first “post-pandemic” year in 2022 is considered.

To limit influences from shifting student population, student FTE was removed from each year’s total as a percentage. While other factors—such as trends in material use, technological changes, etc.—may also represent shifts with yearly trends, FTE removes one of the largest factors as it is a determinant for the size of the population. For example, discovery and catalog pageviews dropped 5.6% between 2018 and 2019 at WMU, although FTE enrollment fell by 7.25%, resulting in a net increase of 1.1%.

Timeframes for each institution are based on fiscal years, which for both institutions is July 1–June 30. While the two institutions both enjoy the same timeframes, the variability of academic calendars would add additional error if compared against institutions, although the trends identified in both may speak to larger changes in user behavior.

The 2019–2020 year was the first year of impact. WMU closed the campus starting on March 18, with a return of classes the following Monday, March 23, after a three-day recess to move courses online. UARK switched all classes to online methods by Monday, March 16, with campus operations switching to remote by Thursday, March 19. For both institutions, campus closures continued until the subsequent fall semester starting in August 2021. The last year studied, 2021–2022, represents the first year of this return period and indicates service levels immediately after the release of pandemic/quarantine conditions.

The investigators based their metrics on Connell, Wallis, and Comeaux, which provides some commonality with previous research, and are based on metrics that are readily available. As both institutions contribute to the Academic and College Research Libraries (ACRL) Library Metrics and Trends survey, information about ILL use, patron interactions, IR use, and FTEs used for analysis are based on ACRL definitions for questions as noted below.¹⁶

The selected data points include:

- ILL borrowing (ACRL #81)
- ILL lending (ACRL #80)
- Discovery and catalog sessions
- EBSCO total item requests
- ProQuest total item requests
- Website pageviews
- Database A-Z pageviews
- LibGuide pageviews
- Patron interactions (transactions, consultations, and virtual reference) (ACRL #64, #65, #67)
- Institutional repository total item requests (ACRL #50)
- Full-time equivalent (FTE)

The authors included use of each institution’s institutional repository (both institutions use the BePress IR system). This metric is based on full-text downloads, provides an interesting metric on

external use of library collections, and opens up further questions about the role of open access content during the quarantine period.

While both institutions have different discovery and catalog interfaces, both used sessions to determine use. UARK had both a catalog and a discovery interface (Sierra and Summon). In both cases, statistics were derived using data from Google Analytics. Both institutions use differing platforms, and UARK maintains both a traditional catalog system as well as a discovery layer, whereas WMU relies on the ALMA/Primo discovery layer exclusively. For UARK, pageviews were added together from both systems to determine a standard number.

Database platforms used total item requests—otherwise known as full-text downloads—to provide consistency across reports. Resource use during the pandemic should be viewed with the understanding that use during the quarantine period may be lower due to the removal of vendor paywalls. However, EBSCO and ProQuest did not remove paywalls during this time.

RESULTS

Western Michigan University

WMU results suggest that library use had returned, but not to pre-pandemic levels. Interlibrary loan borrowing and lending saw large declines during the pandemic period, which is not surprising as many of the lending networks—including Michigan’s resource sharing program—were shut down for most of the year in 2020. As noted previously, many paywalls were removed during this period, which may have obscured requests during the 2020–2021 fiscal year.

Table 1. WMU period changes 2019–2022

Measure of Use	FY 2018-2019	FY 2019-2020	Period change	FY 2020-2021	Period change	FY 2021-2022	Period change
ILL borrowing	7,951	7,591	↓ -5%	5,141	↓ -32%	4,587	↓ -11%
ILL lending	21,725	19,480	↓ -10%	14,422	↓ -26%	12,159	↓ -16%
Discovery and catalog sessions	445,960	451,056	↑ 1%	379,166	↓ -16%	335,776	↓ -11%
EBSCO total item requests	215,516	125,954	↓ -42%	86,768	↓ -31%	82,743	↓ -5%
ProQuest total item requests	247,700	227,043	↓ -8%	190,857	↓ -16%	213,679	↑ 12%
Main website pageviews	414,104	309,253	↓ -25%	168,197	↓ -46%	214,100	↑ 27%
Databases A-Z pageviews	92,469	107,419	↑ 16%	71,529	↓ -33%	60,631	↓ -15%
LibGuide pageviews	335,635	302,439	↓ -10%	196,991	↓ -35%	148,263	↓ -25%
Patron interactions	58,465	31,319	↓ -46%	6,914	↓ -78%	5,822	↓ -16%
Transactions	55,295	28,118	↓ -49%	3,366	↓ -88%	4,508	↑ 34%
Consultations	864	900	↑ 4%	153	↓ -83%	427	↑ 179%
Virtual reference services	2,306	2,302	↓ 0%	3,395	↑ 47%	888	↓ -74%
IR use	1,723,667	2,005,713	↑ 16%	2,907,507	↑ 45%	2,303,927	↓ -21%
FTE	18,589	18,492	↓ -1%	17,305	↓ -6%	15,890	↓ -8%

University of Arkansas

UARK results show a picture of leveling decline after some unexpected growth during COVID. It suggests that while overage usage is recovering, there are larger questions around usage patterns that remain unsolved.

Table 2. UARK period changes 2019–2022

<i>Measure of Use</i>	FY 2018-2019	FY 2019-2020	Period change	FY 2020-2021	Period change	FY 2021-2022	Period change
<i>ILL borrowing</i>	34,574	27,058	↓ -22%	21,643	↓ -20%	20,367	↓ -6%
<i>ILL lending</i>	27,780	23,314	↓ -16%	22,048	↓ -5%	22,709	↑ 3%
<i>Discovery and catalog sessions</i>	848,275	641,396	↓ -24%	302,268	↓ -53%	277,950	↓ -8%
<i>EBSCO total item requests</i>	214,575	172,768	↓ -19%	114,024	↓ -34%	112,909	↓ -1%
<i>ProQuest total item requests</i>	249,210	117,135	↓ -53%	176,800	↑ 51%	219,709	↑ 24%
<i>Main website pageviews</i>	1,528,956	1,066,545	↓ -30%	778,874	↓ -27%	746,114	↓ -4%
<i>Databases A-Z pageviews</i>	16,143	39,498	↑ 145%	22,905	↓ -42%	20,078	↓ -12%
<i>LibGuide pageviews</i>	412,341	511,200	↑ 24%	651,262	↑ 27%	527,485	↓ -19%
<i>Patron interactions</i>	16,450	11,733	↓ -29%	15,539	↑ 32%	14,909	↓ -4%
<i>Transactions</i>	11,379	7,628	↓ -33%	8,798	↑ 15%	8,523	↓ -3%
<i>Consultations</i>	732	491	↓ -33%	497	↑ 1%	337	↓ -32%
<i>Virtual reference services</i>	4,339	3,614	↓ -17%	6,244	↑ 73%	6,049	↓ -3%
<i>IR use</i>	560,680	830,346	↑ 48%	1,232,455	↑ 48%	1,179,719	↓ -4%
<i>FTE</i>	24,407	23,734	↓ -3%	23,679	↓ 0%	24,040	↑ 2%

DISCUSSION

Western Michigan University

Discovery tool use indicates a predictable trend, with generally flat use coming into the start of COVID (2018–2019), a significant decline during the pandemic years (2020–2021), and a general return to just short of pre-pandemic levels (2022). Database and LibGuide views follow a very similar pattern, although LibGuide use rose post-pandemic. These results are consistent with the increased use of LibGuides during the quarantine as faculty leveraged this platform more heavily during the period of online instruction.

Website pageviews dropped during the pandemic and had yet as of 2022 to recover for either institution to pre-pandemic levels. This is surprising, as both institutions leverage their website as a catch-all for the other named services such as LibGuides and catalog use. Further research could indicate some factors here, such as a decreased use of pages related to building use.

The use of the institutional repository (IR) suggests a contrary tail for WMU, with sharp growth during the pandemic and less significant but substantial growth following the pandemic. It should be noted that WMU was consistently loading new content into the IR during this time, and in 2020 ingested a large geologic dataset that may have substantially grown the use of the platform due to high use statewide with mining practices.

Patron interactions saw a significant decline during the measured period and only saw a partial return post pandemic. There was not a 1:1 migration of patron services to digital surrogates, although virtual reference services did grow by nearly 50%, showing patrons moving to digital forms as the building was closed and all services moved online.

Figure 1. WMU trends 2018–2022

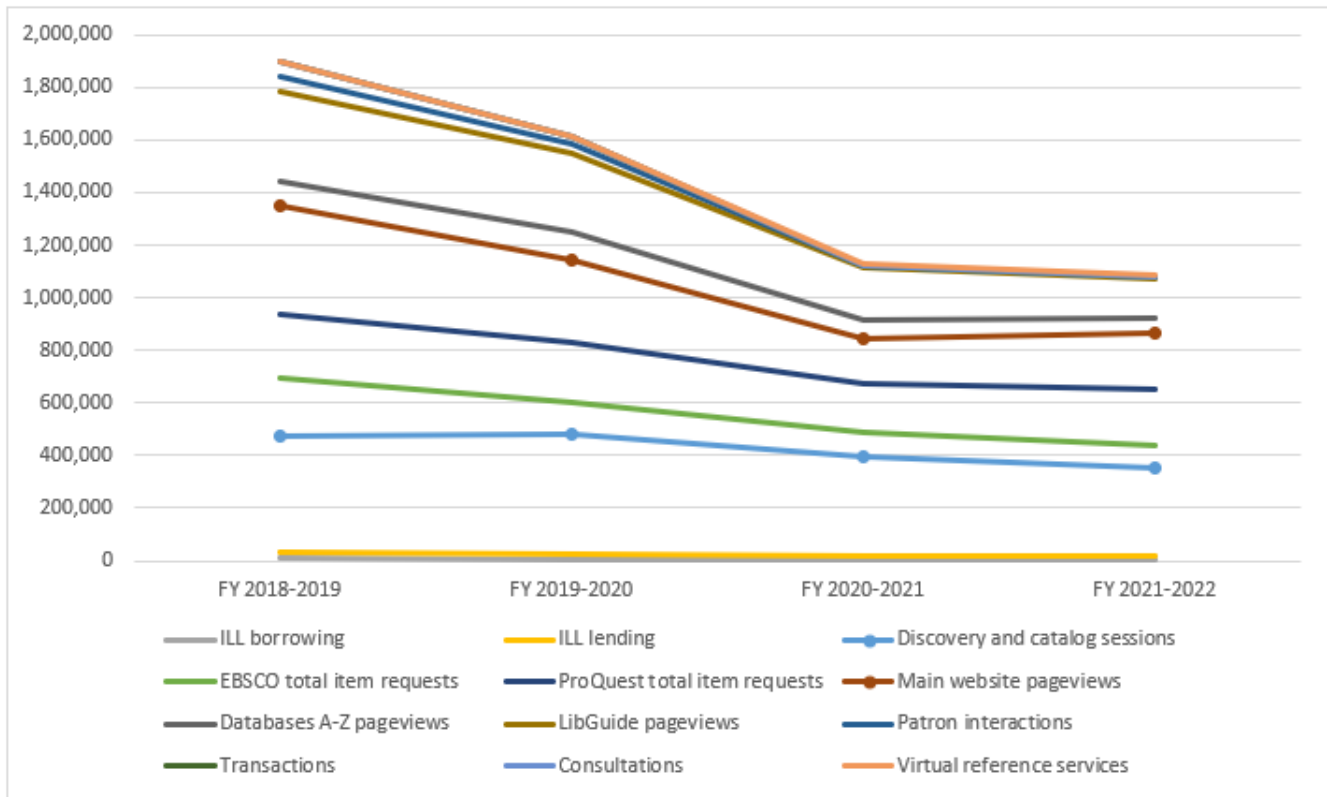


Figure 2. WMU control change

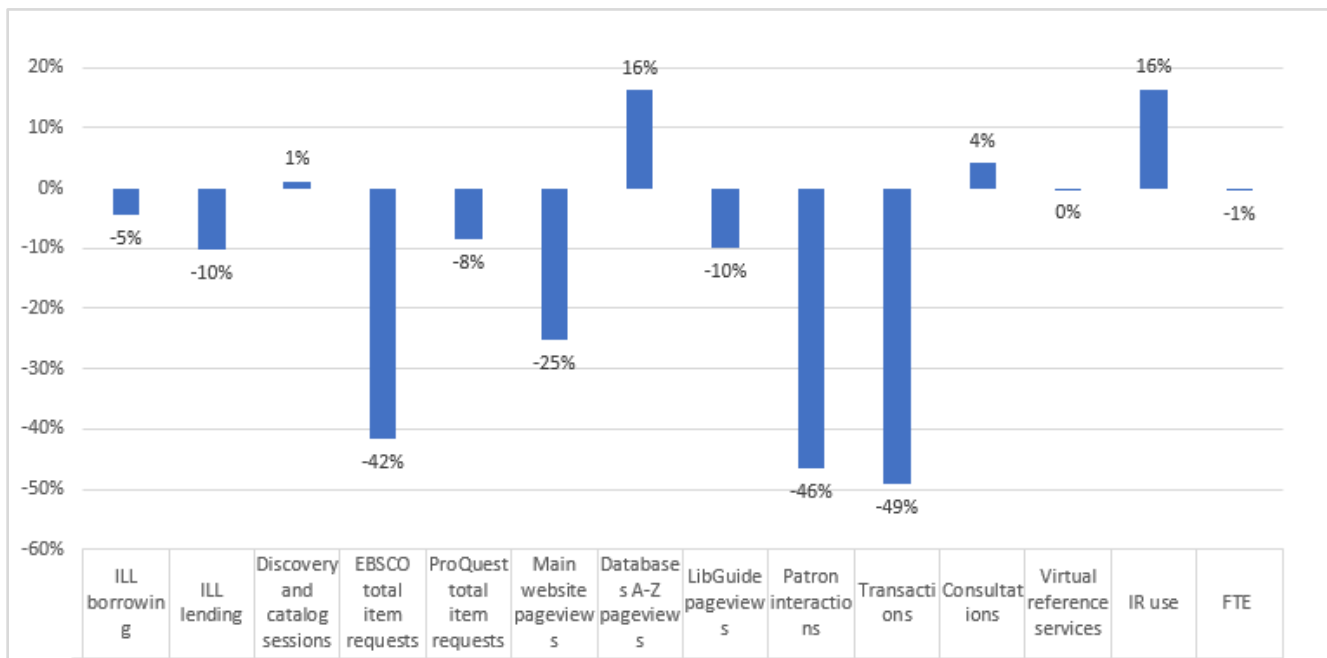


Figure 3. WMU COVID change year 1

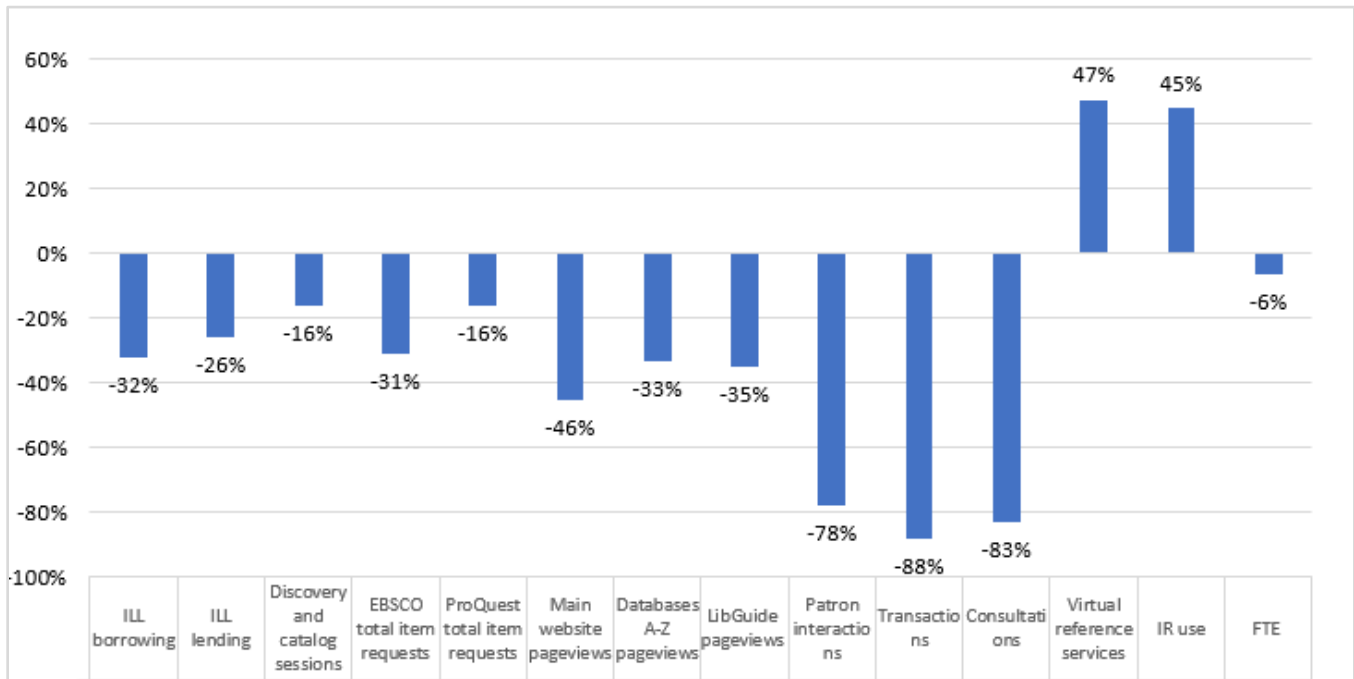
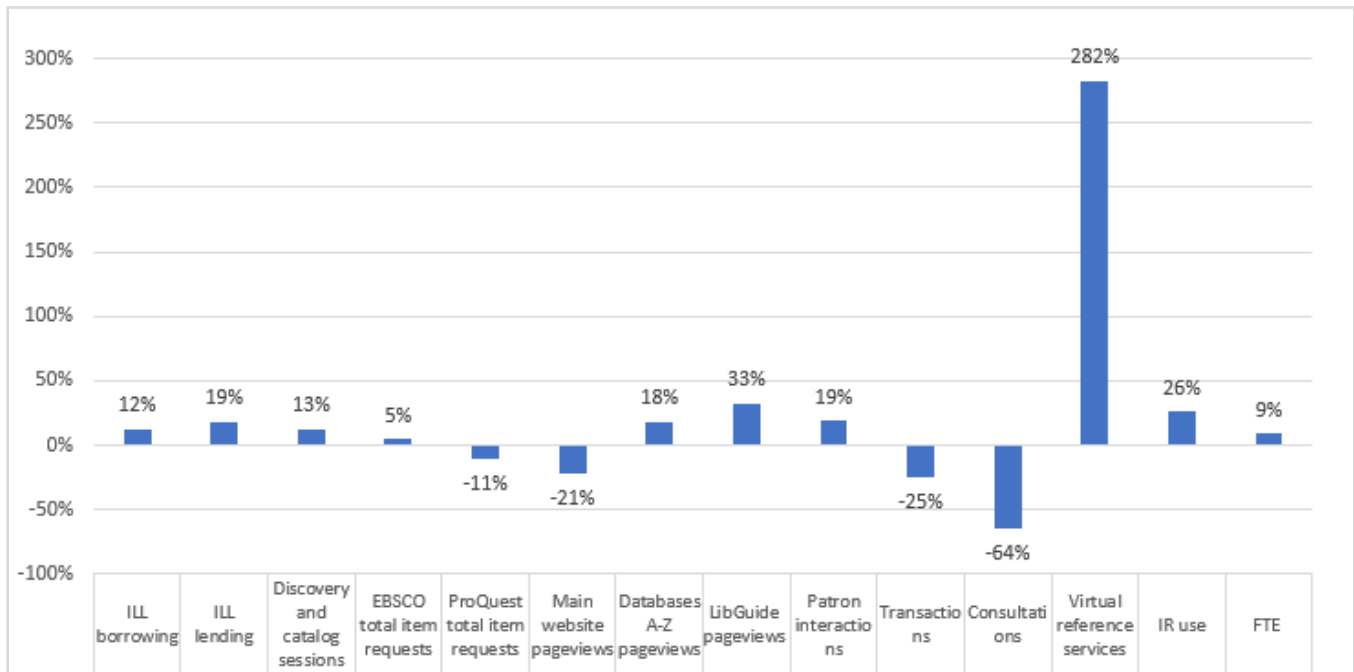


Figure 4. WMU COVID change year 2



University of Arkansas

UARK shows a complex picture of use. Its combined discovery/catalog platforms, main website, and interlibrary loan services saw multiple years of sustained decline, followed by a year of lesser decline. It is important to note that part of this initial decline (2019–2020) pre-dates the start of

the pandemic, so this leveling off is perhaps a more significant trend than can be shown with the date range examined in this study. More research into previous and subsequent years would be needed to determine its overall trajectory and significance.

LibGuides and IR tell a different story, where there were two years of incredible, sustained growth followed by a year of decline. An emphasis on these platforms pre-dated COVID and continued through pandemic times, with positive results.

Patron interactions grew tremendously during the middle, fully remote year for staff and students. This fits well with the above story of growth by LibGuides and the institutional repository. Many patron interactions resulted in patrons being directed to those platforms, which is in keeping with the sustained use of the libraries to keep this information up-to-date and to push question-seekers to use them for coursework and scholarship.

Figure 5. UARK trends 2018–2022

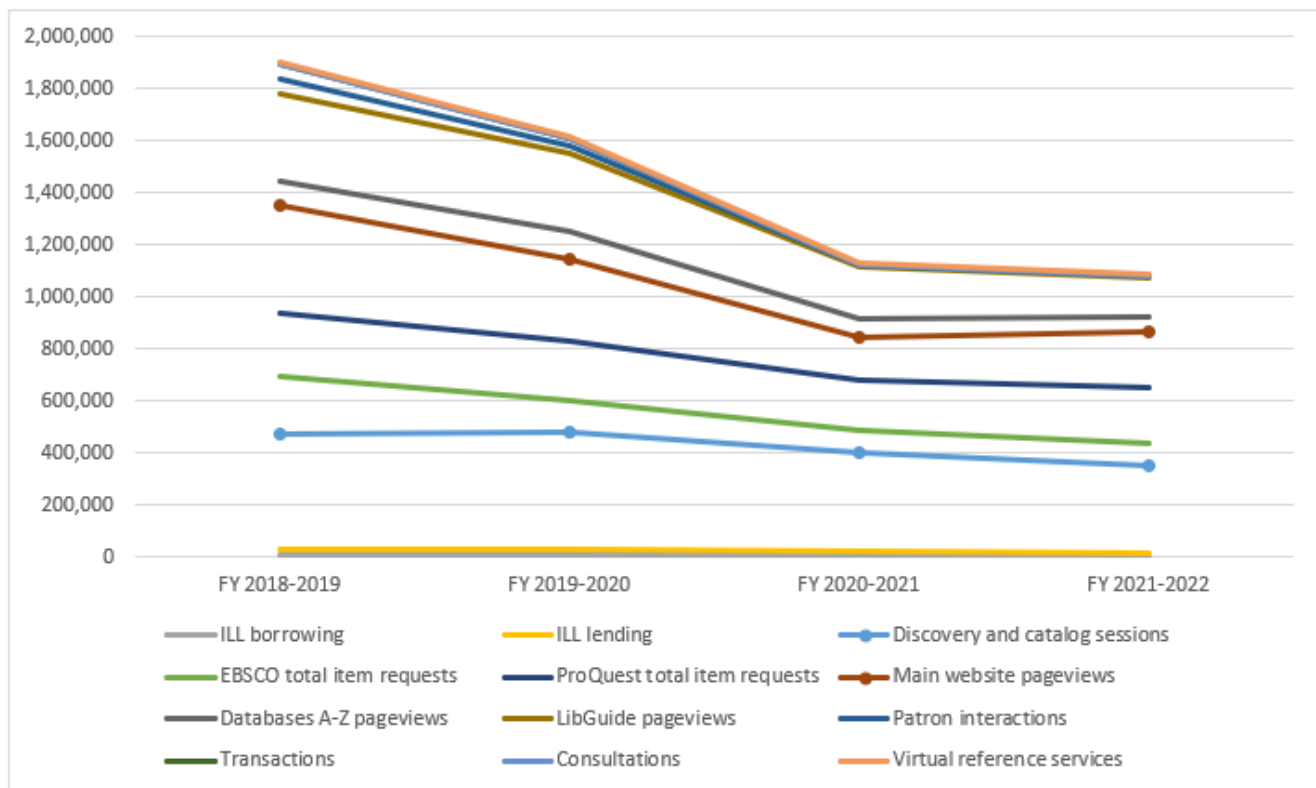


Figure 6. UARK control change

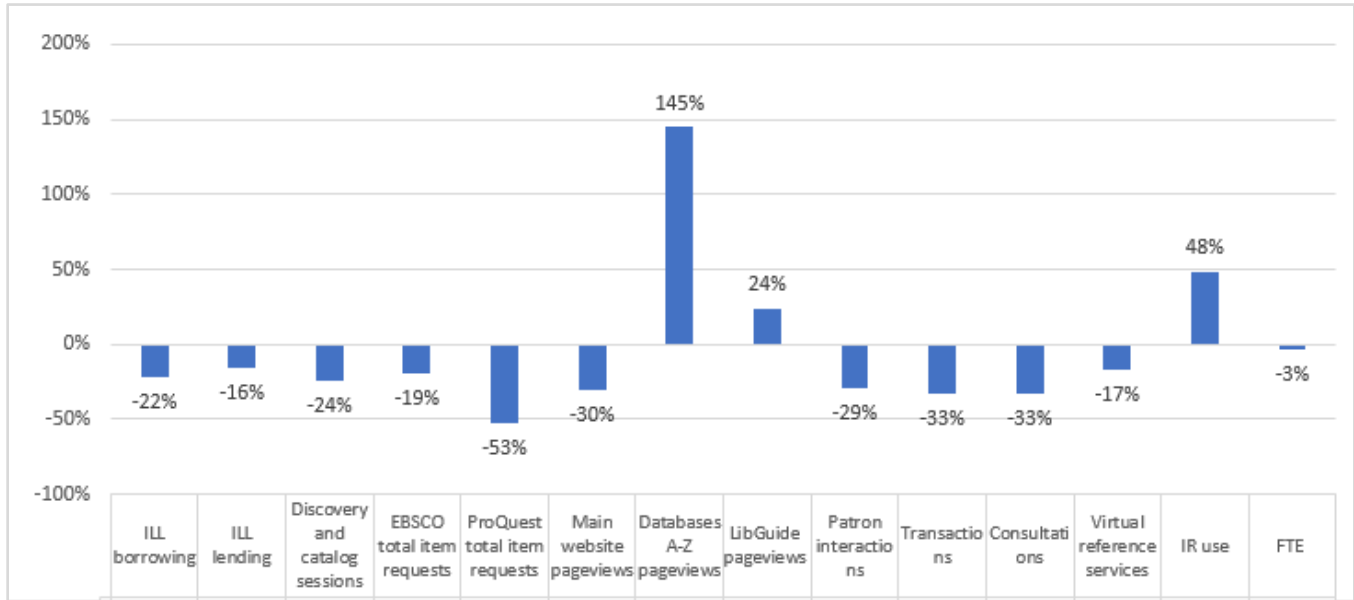


Figure 7. UARK control change year 1

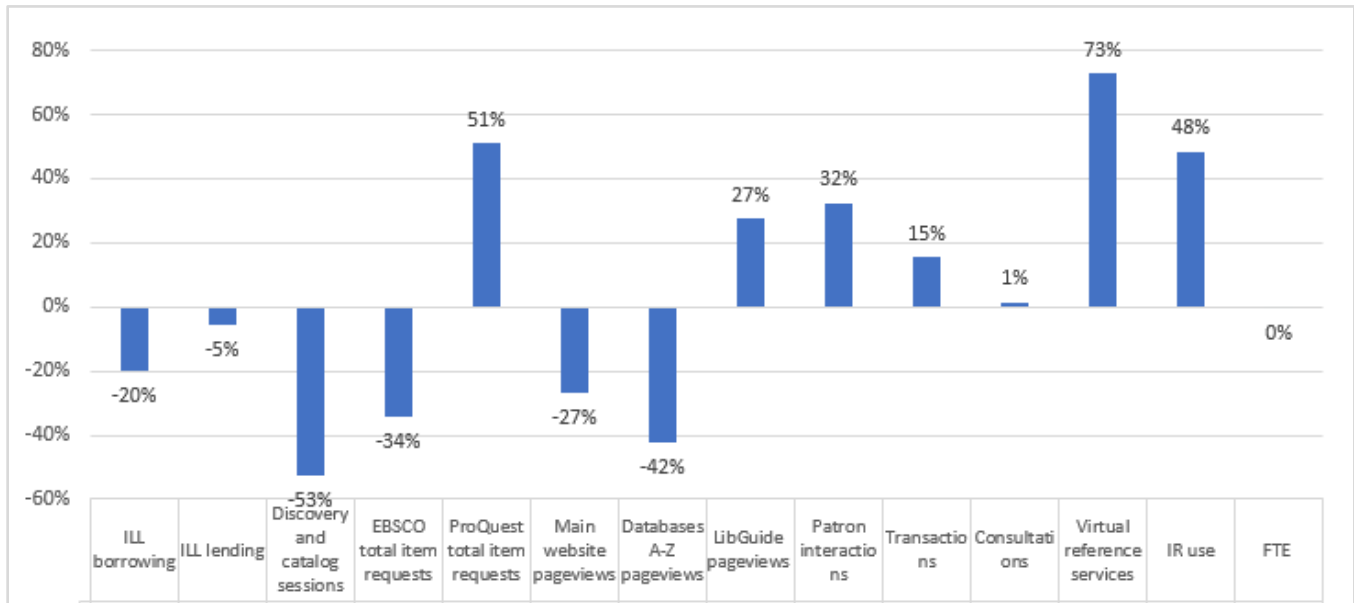
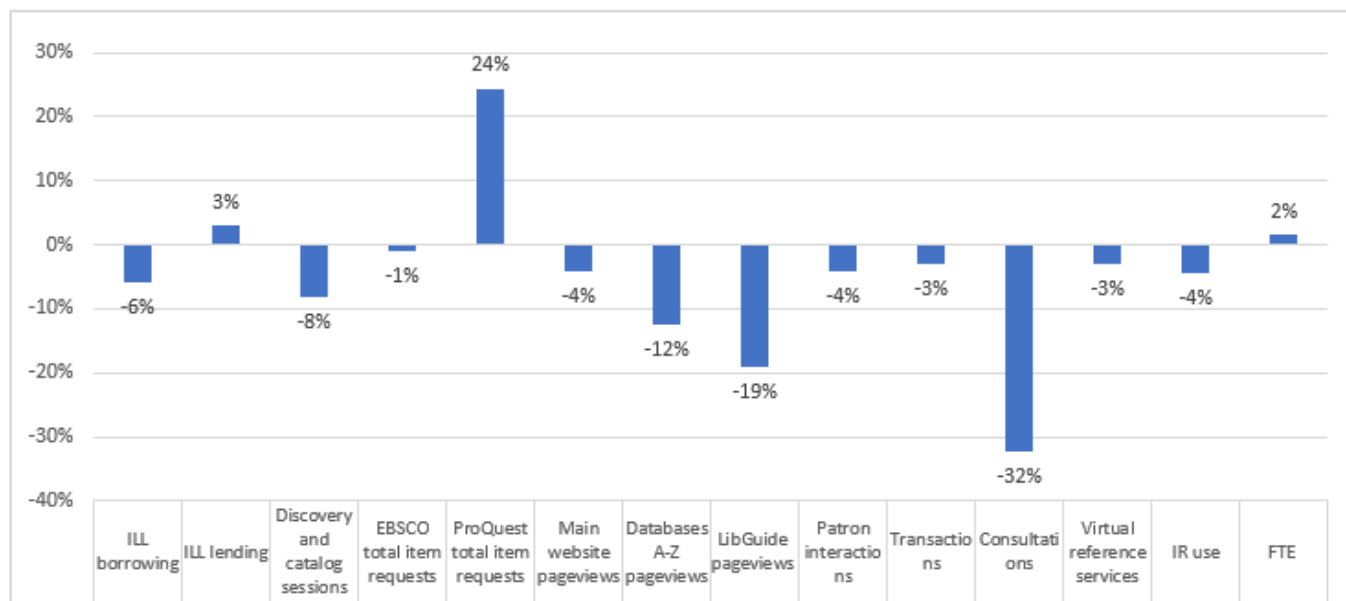


Figure 8. UARK control change year 2



Commonality and Trends

The trends vary between institutions, and the limitations of the study do not allow for close comparison. However, some themes did arise worth considering broadly. Both WMU and UARK were experiencing a decline in most services before the pandemic, both well outside of any enrollment trends that could explain the difference. While both institutions were experiencing shifts with services during the pandemic, interestingly we do not see a common trendline during the first year of the pandemic. When all services are averaged, WMU was experiencing a 12% reduction moving into the pandemic, followed by a much larger 30% loss during the second year and moving into recovery during the third. UARK saw a very different situation, moving from a 5% reduction into 5% growth, then declining 5% during the second pandemic year. The limits of this study cannot further explain the discrepancy, although UARK’s more even response may be more related to changing user behavior than lessened activity due to pandemic conditions. An example is UARK’s change in virtual reference, which was in decline, and expanded by 78% during the pandemic. The second year indicates some correction, with a 3% decline, but with use still well above pre-pandemic conditions that may suggest some changes in user behavior.

Both institutions were experiencing a sharp increase with IR use, with WMU seeing 16% growth in the control year, expanding to 45% during the pandemic, and dropping down to 26% for the third. UARK saw similar expansion, enjoying 48% growth during the control and first year and a slight decline for the third of 4%. This supports an argument that IR saw greater value during quarantine conditions, possibly due to reduced access to physical library collections, and greater use of electronic materials.

CONCLUSION

Use has begun to rebound from its COVID pandemic days, but the overall picture of growth is complicated. Although the universities share a similar academic profile and pandemic-related response, our comparison revealed sharply different patterns around service use, and limitations in the study hinder our ability to explain these differences. It is important to note that, although its

impact cannot be overstated, the pandemic is simply one of many forces that weigh on universities and their libraries. Understanding where library services and their associated technologies are heading will continue to need an assessment of COVID's impact, but the authors suspect this will increasingly be tempered by local, regional, or academy-wide concerns. Conversely, more distinct patterns such as the phenomenal growth in IR use points to a need for further investment in its support and service models. Even now, the two institutions look to reposition their efforts to capitalize on its growth.

It is important to note that this analysis of two universities does not tell how other academic libraries' services might have fared. Although others might see similarly disparate resource rebounding, there are undoubtedly patterns to be found and stories to be told about library growth and use. We wonder if others will find similar growth within their own institutional repositories; regardless of the area, we encourage other libraries to find their own COVID resource use stories, using rich data sources such as the ACRL Library Metrics and Trends survey.

Whether the growth of certain areas and the diminishment of others represent a permanent shift in use remains to be seen. The bright spots of activity may well be signs that COVID has evolved into an accepted part of daily life for some, but the presage of the pandemic still weighs upon the world unevenly as it recovers from COVID's grip. Academic libraries continue to evolve and support their communities, looking toward a brighter future.

ENDNOTES

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