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A comparative analysis of the assessment practices of Lincoln University (Pennsylvania) and Diné College (Arizona)

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Introduction

The purpose of this brief paper is to share the results of a comparative study of library assessment practices of the Historically Black College and University (HBCU), Lincoln University (Pennsylvania) and one of the Tribal Colleges and Universities (TCU) in the United States, Diné College (Arizona). Libraries are required to be more accountable and demonstrate that they are meeting performance metrics through evidence-based decision-making. History and economics can influence assessment practices and for HBCUs and TCUs who have differing histories and relationships to the norms of American culture, they can bring different interpretations to assessment and showing value to library stakeholders. Both institutions have very particular histories outside the mainstream-settler/colonial-of comprehensive and research universities in the United States. Both are the 'firsts' for providing degree programs to their communities and both serve approximately 2000 students.

This study used a mixed-methods approach through an overview of each institution's library website, a survey and an interview. Accordingly, this paper's structure has related literature coming after the introduction, followed by methodology, then findings & discussion. After the conclusion, a three-point list details recommendations for future research.

Related Literature

Universities conduct assessment to show they are meeting the needs of their major stakeholders, students. Measured in various ways, universities are also expected to assist students with becoming adept with the technological requirements of the global marketplace.

> "The economy has become global and information-based, with information literacy skills being essential to successful integration into the modern labor force. Information technology, including the Internet, has augmented the mission of higher education to include producing an information literate workforce" (Norlin and Morris, 2001, p. 184).

The library is seen as the site for this and, as it provides these services, it has to assess itself continuously. For HBCUs and TCUs with their complex political and social histories, library assessment can be more multifaceted. In general, there is not a lot available on the specificities concerning library assessment practices of these institutions in the library literature. For TCU libraries Kostelecky, et al states, "while there is an increasing amount of literature about tribal

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public libraries, archives, cultural centers, and tribal colleges, there continues to be a lack of material focused on tribal college and university libraries (TCULs)" (2017, p. 183). Some publications deal with library directors and their view of TCU libraries (Metoyer-Duran, 1992), what it is like working in a tribal academic library (Dilevko & Gottlieb, 2004), Indigenous collection management practices for three tribal college libraries (Kostelecky, et al, 2017), but information about assessment is minimal. The same applies for HBCU libraries. Norlan and Morris's 2001 study refer to library assessment as part of their overview of the state of HBCU libraries at the time. A series of reports have been published since 2000 about library services at HBCUs, with the most recent collected and analyzed from the Academic Libraries Survey (ALS) conducted by the National Center for Education Statistics by the HBCU Library Alliance in 2008. The Alliance published their results in 2011. The report is a comparative look at library services between HBCUs and 99 peer non-HBCU institutions, analyzing the expenditure per student for all aspects of library services. Like the observation of Kostelecky et al, the authors of this report state a similar sentiment about HBCU libraries,

> "Given the dearth of information available about HBCU libraries in the library literature, as well as the fact that the question of whether or not HBCU institutions are still relevant continues to be debated in the higher education literature, it becomes imperative that either individually, or as a group, these libraries begin to tell the stories of their contributions to the academic success of their campus community and, more specifically, their students." (Askew and Phoenix, 2011, p. 24)

Academic library websites

Because of technology, academic library websites have become the new 'face of the library'. A website can simultaneously demonstrate what the library offers, how resources can be found, display an array of news and programs and advertise its social media presence. Analysis of websites for libraries has been investigated for various content like how these websites show the type of resources and search-ability of an institution (Dewey, 1999) and for design elements and content (King, 1998) (Tolppanen, Miller & Wooden, 2008). Detlor and Lewis (2006) in their study of ARL academic library websites encourages building "robust library websites" as portals of collaboration between academic and research libraries and their users. Concerning websites for publically supported HBCU libraries, Agingu (2000) investigated how their websites as tools for disseminating information and providing services to users needed some improvements. Hill (2012) revisited Agingu's study and acknowledged the existence of improvements since the 2000 study.

Lincoln University

Lincoln University was established in 1854 as a private "institution of learning for the scientific, classical and theological education of colored youth of the male sex" (Lincoln University, 1854), under the name, Ashmun Institute.

"On April 4, 1866, the institution was re-named Lincoln University in honor of President Abraham Lincoln. At that time, Dickey then proposed to expand the college into a full-fledged university and to enroll students of "every clime and complexion." Law, medical, pedagogical and theological schools were planned in addition to the College of Liberal Arts. White students were encouraged to enroll and two graduated in the first baccalaureate class of six men in 1868." (Lincoln University, 1854)

Female students were admitted in 1952 and the university became a public institution in 1972 as part of the Commonwealth of Pennsylvania. Located in suburban Oxford, Pennsylvania, it serves approximately 2200 students with female students as the majority at 66 percent. (National Center for Education Statistics, 2018) Championing its liberal arts roots (Lincoln University, 2019) the university offers close to forty undergraduate degrees, varying Minors and six Masters Degrees. Accredited by the Middle States Commission on Higher Education, the current President is Dr. Brenda A. Allen.

"In 1867, the first catalogue of the Lincoln University library was prepared, a year after the new incorporation" (Bond, 1976, p. 409). Through continued gifts and donations, the collections grew and Vail Memorial Library, constructed 1898, served as the first physical library building. In 1972 a new building, the Langston Hughes Memorial Library, became the new home of the library. The library has 10 full time employees and the Director is Carla Sarratt.

Diné College

Diné College, established 1968, was the first tribally chartered and controlled tertiary institution located on a reservation. First chartered as the two-year Navajo Community College it changed its name to Diné College in 1997. "The college's educational philosophy is based on the Diné philosophy of Sa'ah Naaghai Bik'eh Hozhoon, which places human life in harmony with the natural world, and all faculty-Diné or not-must take courses in Diné educational philosophy and incorporate the philosophy across the curriculum" (Kostelecky et al, 2017, p. 182). As a liberal arts college, "classes are based on the Diné experience and ways of knowing, offering 8 accredited bachelor's programs and 28 Associate of Arts degrees. There are also certificate offerings by the college" (Dine College, 2017). Accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools it serves approximately 2000 students, the majority of which are from the Navajo Nation with a 66 percent ratio for female students. (National Center for Education Statistics, 2017). There are six locations spread over the two states of New Mexico and Arizona, and the current President is Dr. Charles "Monty" Roessel, Ed.D.

Diné College has three library locations, the Kinyaa'áanii Charlie Benally Library, which is the main library on the Tsaile campus in Arizona. The Senator John D. Pinto Library in Shiprock, New Mexico was built in 2011 in accordance with Dine philosophy and cultural mores, and the Crownpoint, New Mexico center is the third. The library's website lists 12 employees across the three locations and Dr. Herman Peterson serves as College Librarian.

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Methodology

With a qualitative focus, a visual overview of the library websites was first conducted using nine predetermined characteristics related to assessment, Mission statement; Vision; Strategic Plan/Goals; Social Media; Facts & Figures; Assessment Website; Assessment Plan; Assessment Studies/Reports; Comment/Feedback. The home page was the starting point by first, giving it an in-depth perusal then searching under any tab titled 'About'. If that was not successful, a general investigation of the website was made by using an existing search box or by going through tabs not associated with finding library resources. After the overview, completed fall of 2018, the six-question survey was emailed to library administrators to elicit information about their assessment practices using directories from the Historically Black Colleges and Universities Library Alliance, and the Tribal College Librarians Professional Development Institute at Montana State University. Distributed as an attachment of a form email on January 31, 2019, the survey was open for 28 days. In the case of Diné College, the initial distribution of the survey was done through another tribal library administrator who offered to share it through a list serve for tribal college library staff and administrators. On February 19, 2019, a second email with the survey was sent as a reminder. Interviews were conducted where interest was expressed.

Findings & Discussion

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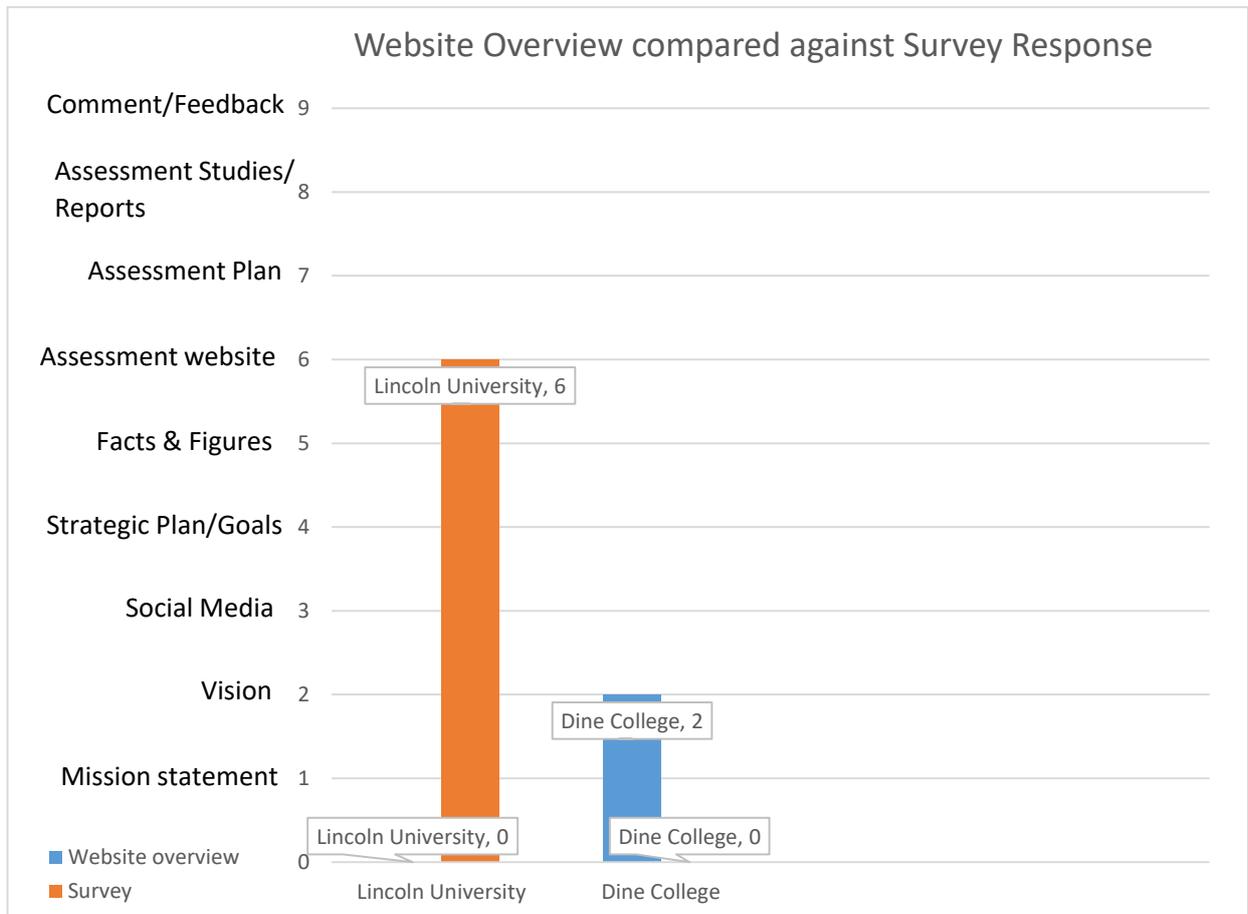
Figure 1: Website Overview compared against Survey Response

Carla Sarratt, Director of the Langston Hughes Memorial Library was interviewed for 45 minutes by telephone on April 26, 2019. In responding to the survey, Diné College stated that no assessment was currently being undertaken. In order to compare and contrast assessment practices between the two institutions, information for Diné College Libraries was taken from a survey available on their website. The library conducted an 'in-house' survey using Survey Monkey that ran from April 28-May 5, 2014. The focus was on library services and the results are available on the library website under the About tab and then under Library Policies.   The survey consisted of eight questions, the last being a demographic query broken down into student, faculty, staff/administration and community patron. Questions 5 and 6 were open-ended questions that garnered feedback that is detailed in the results. The survey questions used a four-point Likert scale of, very important, somewhat important, not important and don't know. Of the remaining five questions, two had nine subsections. Two hundred and thirty one library users, the majority of whom were students, answered the survey.

In general, it was evident that each library's approach was very specific to its history, situational politics and funding. The Langston Hughes Memorial Library's website was set within the larger university's website, even though it is a separate standalone website. Diné College's website is a standalone entity. Searching and navigating the websites for assessment information was complex and usability of the two sites was a little clunky. The two institutions' 'main page' centered on show casing the libraries' resources like the catalog and databases. Also prominent were opening hours, Libguides or assistance from a librarian. The email survey produced more information about the library's assessment practices, as evidenced by the survey responses for the Langston Hughes Memorial Library in Figure one above. Internal library documentation listed six of the nine markers whereas nothing gave that indication on the website. The 2014 survey indicted an example of Diné College Libraries' assessment practices.

Research/Practical limitations

One of the biggest limitations was the lack of response from Diné College. A secondary consideration was how much information would be shared in the interview.

Conclusions

Assessment information available on each library website was limited. Both are aligned with the missions of their parent institutions, and funding is an ongoing concern. For TCU libraries, "these institutions must be seen within the context of the political, economic, social, and cultural issues faced by Native governments." (Dilevko & Gottleib, 2004, p. 45). Likewise, Lincoln University's current endeavor to re-brand and focus on its liberal arts roots may be a way to stem some of the changes happening with HBCUs. (Hamilton, et al, 2015) Both conduct assessment necessary for accountability to their various hierarchical 'parents', whether it is university administration or an array of local, state and governmental funding bodies. Moreover, it is through engagement that more was and can be learned. The two libraries realize the value of ongoing communication

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with users and of conveying assessment information in various forms. Maybe one way to show this type of accountability is through an external exhibition of their organizational intent to their stakeholders and the library's website is the perfect place as the 'new face' of libraries.

Originality and value

Although libraries are identified as places for information, they are not exempt from life happening around and to them. The two libraries are living 'entities' built to support the educational missions of their parent institutions. In their discussion about collections management at three tribal college libraries in the American Southwest, Kostelecky et al (2017, p. 193) aptly observed "this overview demonstrates that there is not one correct path [to indigenizing libraries]. Instead, institutions must consider their own contexts, including their mission, communities and resources". This observation is applicable to library assessment.

Recommendations for Future Research

Therefore, I would recommend the following for future research:

- More focused research on individual institutional history and organizational structure with the following factors in mind; the type of institution whether public, private or religious affiliation, how it is funded and any cultural traditions/histories that may influence how assessment is conducted.
- Using interviews to get specific and detailed material about an institution's assessment practices.
- Examine more closely the potential for using websites (assessment or otherwise) to convey assessment information, promote a continuous conversation with users, demonstrate value to the academic communities and market the libraries' resources and services. It can show a library's value and promote the library as an integral part of the university.

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Appendix 1

How HBCU and AIHEC Academic Libraries Do Assessment and Show Value

Study Survey

You are being asked to complete a brief survey on how the academic libraries of Historically Black Colleges and Universities (HBCU) and the American Indian Higher Education Consortium (AIHEC) conduct assessment and show value to their constituents.

Participation in this survey is completely voluntary and any information provided will be kept confidential and reported in the aggregate. The information that you provide will be used to expand the literature on assessment.

As an additional option, at the end of the survey you will be asked if you are willing to volunteer to participate in a follow up interview via phone or Skype.

If you have any questions about this survey or the study itself, please do not hesitate to contact the principal investigator, Simone Clunie, MS, via email at sclunie@fau.edu

Please complete and return the survey by February 28, 2019, as an attachment of an email to sclunie@fau.edu

1.   Does your library conduct assessment?

____Yes

____No

If yes, which of the following activities does your library undertake? (Select all that apply)

____Mission Statement

____Vision Statement

____Social Media

____Strategic Plan/Goals

____Fact & Figures

____Assessment website

____Assessment Plan

____Assessment Studies/Reports

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_____Comments/Feedback

2.   Is assessment designated with a full-time position at your library?

_____Yes

_____No

If not, please explain:

3.   How do you or your institution define assessment?

4.   How do you or your institution define value?

5.   Do you make an attempt to show value to your stakeholders?

_____Yes

_____No

If yes, please explain:

6.   Additional comments:

OPTIONAL: If you would be willing to participate in a follow up interview at a later date by phone or Skype, please provide your contact information below.

Appendix 2

HBCU/TCU Interview questions

1.	Are the library's assessment endeavors driven by the wider assessment practices of your parent institution's requirements?

a.	Can you say why this is so?

2.	Does the library ever participate in ARL's LibQual, Counting Opinion's LibSat, or create its own homegrown survey?

a.	Why or Why not?

3.	Is the library meeting its assessment goals in the types of services, resources and programming it provides to it stakeholders?

a.	Please provide some examples for each.

4.	Can you expand upon your survey response for defining value and attempts to show it?

a.	Please provide some examples.

5.	Do you think the institution's library website is a good place to gather user feedback and show results and improvements?

a.	Please give some concrete examples of both.

6.	Additional comments:

A Framework for Evaluating the Effectiveness of University Libraries

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Introduction

In the rapidly changing environment, libraries have to demonstrate that their services have relevance, value and impact for stakeholders and customers (Lakos & Phipps, 2004:345). The expression that libraries are the heart of a university has made library managers not even think of proving their worth. However, factors such as diminishing university funding as a result of changing funding methods by the South African Department of Higher Education and Training (DHET), calls for free education, high escalating costs of running a university, have increased competition for resources within the university context. Faculties and support departments are now required to provide evidence to prove their worth. University libraries are no exception to this trend. Evaluating and reporting effectiveness is no longer an option, but a serious reality as libraries, in general, are under massive pressure to prove their value in competition with other information service providers and are also facing budget cuts (Usherwood & Jones, 2000:80).

Traditional library performance indicators are not enough to convince decision makers of the libraries value in the academic project (McNicol, 2005:497) and (Thorpe, Lukes, Bever & He, 2016:389) as usually expressed in the planning and reporting documents. Libraries, in particular, are facing an additional challenge of striving to align themselves, not only with the overall mission and goals of the university, but also with the effectiveness principle by which universities are judged by the Higher Education Quality Committee (HEQC) (Dube, 2011:26) . Utilisation statistics alone do not display value, so libraries must look to different actions to demonstrate the impact they have to their funding agencies (Allison, 2015:29), 2015:29).

The purpose of the study was to develop a framework for evaluating the effectiveness of university libraries that can be applied in the South African university library context. To achieve this purpose, the following objectives are pursued:

• To determine how university libraries plan their effectiveness

• To establish indicators of effectiveness used by university libraries

• To determine how the effeteness of the academic libraries is evaluated

• To determine how university libraries are reporting on their effectiveness

This paper present the result of the study done at six university libraries in South Africa. The aim of the study was to perform a gap analysis on the evaluation of library performance in South African higher education libraries. The results from the interviews, Library strategic plan and annual report are presented.

South African higher education and performance

South African higher education landscape consists of 26 publicly funded universities. Department of Higher Education and Training (DHET) as a funding body is responsible for setting up performance matrix   The following performance indicators are somehow used by the DHET to evaluate the performance of institutions of higher learning.

- Student enrolments

- Students pass rates

- Retention

- Student graduation rates

- Staff qualifications

- Research outputs

University management is expected by the DHET to report on their achievement on the above-mentioned academic indicators and the universities are funded based on these indicators; therefore, for libraries to stay in business, they have to demonstrate their effectiveness in helping the university to reach these targets.

Methodology

An interpretative, qualitative multiple cases Yin (2012:7) study conducted within the South African higher education environment. According to Universities South Africa (USAf), there are 26 public universities in South Africa (USAf, 2017). They were formed by a major restructuring of the institutional landscape through mergers, incorporation and the creation of new institutions. Within each institution, there is a library that supports the academic project that is teaching, learning and research. This study focuses on those academic libraries and their performance effectiveness. The data is collected from six South African university libraries namely: two traditional universities, two comprehensive universities and two vocational universities. Two senior library managers from each were interviewed telephonically and recorded. The audio interviews were then transcribed into printed transcripts that were analysed using ATLAS.ti 8.0 following a pattern matching and explanation building approaches. The strategic plans and annual reports of all six libraries were collected and analysed as secondary data using content analysis to determine the frequency of words used in the reports.

Results

To investigate objective one, six cases which were split equally between vocational, traditional and comprehensive universities were used. For ethical reasons, Pseudo names were used to name the universities so that their true identity is not revealed but only the data is focused on. The six universities will be Alpha, Beta, Delta, Gamma, Theta and Omega

A total of fifty initial codes were extracted in the study; these codes were consolidated into nine groups of codes, then to four themes.

Table (1: Group of codes and themes)

Themes	Group of codes (sub-themes)
Theme 1: Planning effectiveness	Key strategic goals
	Strategic plan compiled
Theme 2: Indicators of effectiveness	Mandate fulfilment
	Library impact
	Performance indicators

Theme 3: Evaluation of effectiveness	Goal monitoring
	Evaluation tools
Theme 4: Reporting effectiveness	Goal achievement
	Challenges to goal achievement

All respondent indicated that they do have strategic plans with goals. This is in line with (Roberts & Wood, 2012) who indicated that it is the mostly used planning model in libraries. The respondents also indicated that their goals are aligned with those of the university they support.

Objective #1: To determine how university libraries plan their effectiveness

The comparative analysis of data from Theta vs Omega cases revealed that both use strategic plans for planning effectiveness and both have key goals that they want to achieve. Theta wanted to be a valuable part of the education and teaching value chain; to enhance the research lifecycle; manage institutional research data (RDA); and develop, and provide effective and efficient staff skills. On the other hand Omega's key goals are learning and research space; re-engineering of processes; cost savings; providing quality information literacy programmes; provision of access to research information and support services; and supporting the creation, discovery, sharing, and preservation of the institutional knowledge

All cases compile a strategic plan with key goals and action plans to achieve those goals. As Saunders (2015:283) pointed out, a strategic plan is a systematic process of envisioning a desired future and translating this vision into broadly defined goals or objectives and set a sequence of steps to achieve them. However, all of the goals, except one goal of Theta, were not found to be linked with the actual effectiveness or impact of a library on university performance. The Theta goals were found to be linked with the university core functions namely:

"*To be a valuable part of the education and teaching value chain*"; the other one is "*To enhance the research lifecycle*". These two goals confirmed what was found in the literature.

As Allison (2015:31) has already pointed out, library impact is the correlation between the academic libraries' outcomes to institutional outcomes related to the following areas: student enrolment, student retention and graduation rates, student success, student achievement, student learning, student engagement, faculty research outputs, faculty teaching and overarching institutional effectiveness.

Objective #2: To establish indicators of effectiveness used by university libraries

The usage of information resources in the form of circulation check outs, articles and e-book downloads are the most common performance indicators in the cases. Library impact on university outcomes were not found as performance indicators in all cases. University libraries found it challenging to correlate their outcomes with those of a university as parent institution. As Allison (2015:30) argued that usage statistics alone do not demonstrate value, so libraries must look to other means to prove the impact they have on the community they serve.

Output measures, such as gate counts and head counts, are no longer sufficient to demonstrate the role of the academic library within the campus ecosystem (Thorpe et al., 2016:1). They can be intended in the form of goals or unintended in the form of circulation statistics, gate counts or article downloads from library databases (Calvert, 2008a:90)

Objective #3: To determine how the effectiveness of the academic library is evaluated

The most common tools that are used for evaluating performance are library internal surveys, LibQUAL, online complaints. However, these are mostly used to check customer satisfaction and not necessarily the effectiveness of a library to fulfil its mandate. This confirms Allison (2015:30) when pointing out that the instruments that have been used to evaluate impact include surveys, focus groups, observation, citation analysis, pretesting and post-testing, and comparisons of library usage with evaluations of student success It is an analysis that demonstrates an alignment of library activity with the mission of the institution (Allison, 2015:31).

Objective #4: To determine how the effectiveness of the academic libraries is reported

Libraries in the study report on activities that took place during the financial year. This is complemented by the usage statistics, staff, expenditure and projects completed. Some as in the case of Theta and Omega, include survey results. Although these indicators are essential to show the efficiency of the library, they lack evidence of the impact on institutional outcomes.

The most important reason for evaluating effectiveness is to promote the library's role in support of the academic agenda (Poll & Payne, 2006:556). All cases were found to be using annual reports for reporting effectiveness. What was found to be included are goals achieved, expenditure, human resource issues, new services introduced, progress on projects, statistics on information resources purchased and physical resources, such as the number of chairs or computers available.

This is in line with what is suggested by Staines (2009:149) that information presented might include such metrics as the number of information resources purchased, number of searches on databases, number of information literacy sessions, and number of items uploaded, along with highlights of major projects and programmes.

Gap analysis model for findings

The data confirmed that the libraries sampled are planning, evaluating and reporting effectiveness up to the outcomes level. The impact has not been evaluated and not in a formally planned way. One of the most influential frameworks in the service quality literature is the model of Parasuraman et al. (1985) which is widely utilised in the literature. The service quality model adopted from Shahin and Samea (2010:9) is used to illustrate the gaps in the evaluation of effectiveness in university libraries.
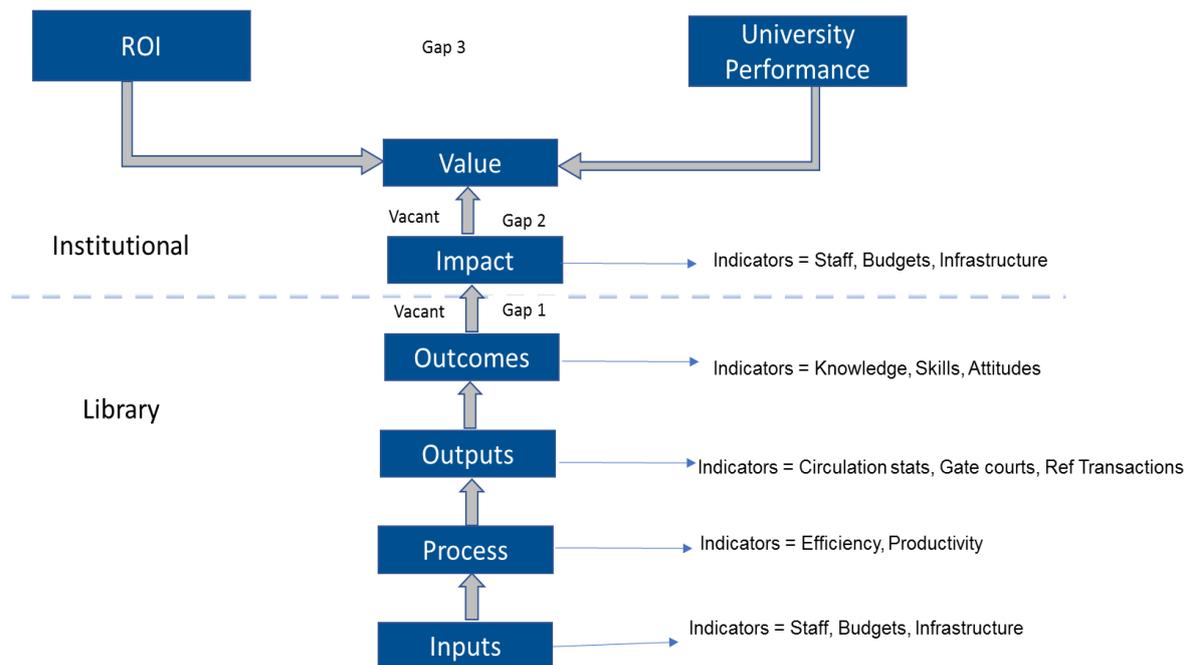
Figure (1.1: Gap analysis model of findings) adapted from Shahin and Samea (2010:9)

Gap 1: Evaluation of outcomes

In the literature, outcome has been results of libraries output on individuals who use them. These may include changes in attitude, skills, knowledge, behaviour or status. The findings indicate a gap in the libraries being studied. Evidence of outcomes planning, evaluation or planning was not found on both primary and secondary data.

Gap 2: Evaluation of Impact

Library impact is the correlation between the academic libraries' outcomes to institutional outcomes related to the following areas: student enrolment, student retention and graduation rates, student success, student achievement, student learning, student engagement, faculty research outputs, faculty teaching and overarching institutional effectiveness (Allison, 2015:31). The positive impact of library services on university outcomes becomes valuable to the university because the library helps the university to achieve its goals as measured by the DHET.

Libraries' impact is measured using tools such as surveys, focus groups, questionnaires, observation, citation analysis, pre-testing and post-testing, and comparisons of library usage with evaluations of student success (Allison, 2015:31), (Payne & Conyers, 2005:2). Indicators of effectiveness are in the impact of a library on university outcomes.

This gap has been found not to be filled by the libraries in the study. During the interviews, most of the participants indicated that it is difficult to correlate the library's outcomes to university outcomes. Although tools for evaluating impacts such as surveys and LibQUAL were used in most of the cases, they were surveying the student's opinion about the library service quality and not about how well the library is helping the students to prepare their assignments, for example.

Gap 3: Evaluating use, ROI and Value of library on university performance

Value can be defined in a variety of ways and viewed from numerous perspectives Parasuraman, Zeithaml and Berry (1985), including use, return-on-investment, commodity production, impact, and alternative comparison.

When library outcomes are compared to university outcomes, they indicate value to university performance. When the value of the library is expressed in terms of rand value, it becomes a Return on Investment.

Conclusion

The performance indicators of effectiveness, which are student enrolment, student retention and graduation rates, student success, student achievement, student learning, student engagement, faculty research outputs, faculty teaching, were not found in library strategic plans. Therefore, it can be concluded that all six cases do not include the university performance. The performance evaluation by all cases ends at the outcomes level and not towards evaluation impact. The second conclusion is that the libraries under this study do not evaluate the effectiveness of their library to university performance.

It was discovered that in all six cases, libraries do evaluate their performance, however not to the level of their impact on the university performance. What is reported, is mostly activities that took place during the financial year and not the achievement of university goals.

Recommendations

Recommendations for library managers and practitioners

In order to fill the gaps identified in gap analysis framework, the following framework is recommended.

The framework emphasis the importance of performance indicators from the planning stage to implementation and results. It is trying to answer the question "how are we going to not that we have achieved what we wanted to achieved. Those indicators must be the libraries contribution into the university performance indicators. If the university is planning to increase its student performance for an example, the library need to develop an indicator of its contribution to the increased student performance. These can be an increased downloads of the students who performed well in their assignment and tests.

In the framework in figure 1.2 below, library effectiveness stats with **leadership** as facilitators of Library effectiveness. The key performance indicator must be measurable and linked to the indicators of the university and the academic offerings.

University performance indicators, such as student success, student achievement, throughput rate, graduation rate and faculty research outputs as indicated by Soria, Fransen and Nackerud (2013) are the starting point when it comes to planning for Library effectiveness. This is couples with academic offerings and trends in the librarianship. All three components form basis for planning effectiveness.

The third component will be formulation the **strategies** or approaches for library effectiveness. This are strategies on how the library is going to contribute to the achievement of the university performance. Value add and outcomes need to be predicted at this stage. The performance indicators expected here are strategic and linked to university performance.

The fourth component is about developing all **processes** to implement the planed strategies. Efficiencies and productivity are the indicators of performance. Process or productivity measure are concern with the activities that transform resources into service offered by the library (Matthews, 2010:90). Efficiency of the resources allocated and the policies guiding the implementation need to be determined and measured.

The last component of the framework is documenting and reporting the **effectiveness** of the libraries roles in university performance using the indicators formulated in the planning stage. These can be done through periodic report to the university decision makers. Outcomes, impact and value must be showcased in the way that in to me understood and value by the university management. The process is not a one off exercise, but repeated annually for monitoring and improvement
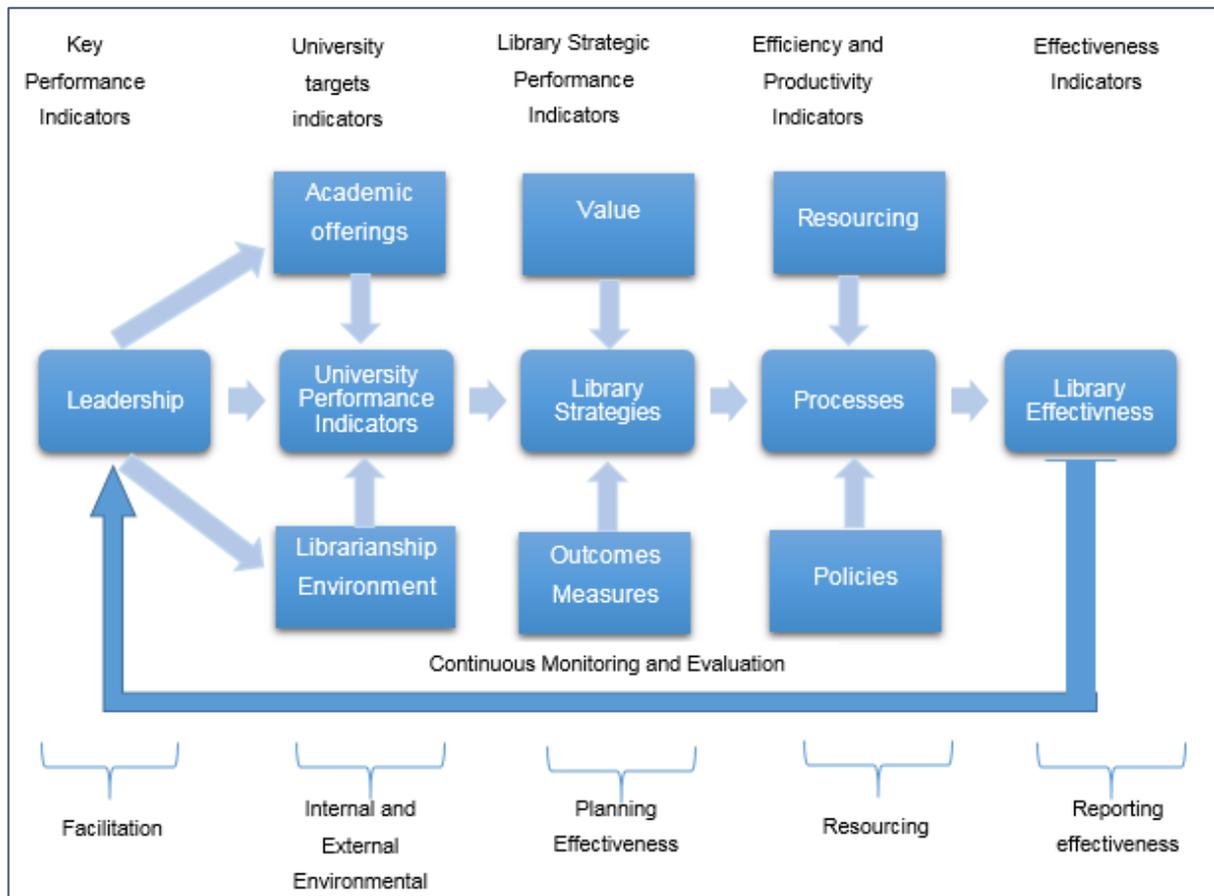
Figure (1.2: A Framework for evaluating the effectiveness of university libraries)

The effectiveness of the university library can be evaluated by linking the correlation of library use and academic success. Assessing student library visits, checkouts, journals viewed, printed with tests or assignments results. The assumption is that students who use the library are more likely to perform better than those who do not. Therefore, the library plays a role in the student throughput, also saving money for the institution.

Recommendations for further research

The study provides the snapshot of six libraries, the view of the other 20 university libraries still need to be researched and reported to see if the same conclusions can be made. The recommended framework has not been tested in any university library.

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A Non-Programmers Guide to Enhancing and Making Sense of EZ Proxy Logs

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Abstract

Libraries throughout the world use OCLC's EZproxy software to allow users to securely access e-resources purchased by their institution. When a student or faculty member accesses a resource through EZproxy, EZproxy records their username, the date/time of their request, their IP address, and the URL requested in the EZproxy server log, along with a wealth of other extraneous information. When cleaned, processed, visualized and enhanced, these logs can paint a valuable picture of a library's impact on researcher's lives by showing what they use and when they use it.

This paper will share techniques and procedures for enhancing and de-identifying EZproxy logs using Tableau, a data analytics and visualization software, and TableauPrep, a tool used for cleaning, combining, and shaping data for analysis. It will also show how to effectively and securely visualize and share this data to allow librarians and library staff to use the data for advocacy and to inform their own practice.

In February 2018, The Ohio State University Libraries established an automated daily ETL process to extract and clean EZ proxy log files and then deposit them on a secure server in a .txt format. The assessment librarian then created a series of procedures to union and parse these files using Tableau, then enhance them by joining the files to other data sources to add the user department/major, the user status (faculty, graduate or undergraduate student), the title of the requested resource, and the LC call number for the resource in Tableau and TableauPrep. She then stripped the entire dataset of usernames before analysis and applied best practices for maintaining confidentiality when visualizing the data.

As of January 2019 the dataset is 1.5 million rows and growing. The visualizations may be filtered by LC classification, as well as user status and user department/major where applicable. Safeguards are in place to limit data presentation when filters might reveal a user's identity. The assessment librarian is also working to help librarians and staff determine how they might use the visualizations for advocacy and to inform their work.

Analyzed EZproxy logs have multiple applications, yet can only illustrate part of a library's contribution to student and research success. To create a fuller, nuanced picture, additional qualitative and quantitative data is needed.

Tableau used in concert with TableauPrep allows an assessment librarian to clean and combine data from various sources without needing to write code. Once procedures for cleaning and combining data sources are established, the data driving visualizations can be set to refresh on a set schedule. This expedites the ability of librarians and library staff to derive actionable insights from EZproxy data and to share the library's positive impact on researcher's lives.

A small number of librarians have shared their experiences processing and enhancing EZproxy logs using tools such as python scripts, regular expressions, and log analyzer programs like EzPAARSE (Baylis 2017; Gonzalez 2018; Smith 2017; Yeager 2017). A few have used python, Tableau, and Google Charts Tools to visualize the data (Baylis 2017; Anon. 2018; Gonzalez 2018; Morton-Owens 2012). This paper shows how to enhance cleaned EZproxy logs directly in Tableau and TableauPrep and apply best practices to maintain user confidentiality before analyzing and when visualizing the data.

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Academic library services in Learning Management Systems (LMS)

Methodologies for evaluating digital library content and system usability

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Abstract

Purpose

Existing research estimates a rapid increase in the use of external sources of information, in particular Google, Google Scholar and Wikipedia, by library users (Carpenter, 2012; Tenopir, 2003; Tomlin, Tewell, Mullins, & Dent, 2017). Tomlin et al. (2017) estimates that 13% of the attending students has never used library resources. Carpenter (2012) finds that 30% of UK Doctoral students uses Google or Google scholar as their main source of information. In a literature review by Tenopir (2003) the same patterns are shown for high school students and college students. The study argues that the students perceive themselves as experienced users of the Internet. Biddix, Chung, and Park (2011) seek explanations to why students tend to use ressources other than the resources offered by their academic library. In a survey of 282 students show that students value efficiency over credibility. To address students, existing studies have explored how library visibility can be improved in learning management systems (LMS) as this is a digital environment already used intesively by students (Black & Blankenship, 2010; Schrecker, 2017). Schrecker (2017) finds that usage of the implemented library resources in fall semester outpaced spring semester use with 13%, after implementation of services in LMS-environments. This indicates that by implementing services in LMS-enivronments it has an impact on the electronic use of academic libraries.

The abovementioned studies that have integrated electronic library resources successfully in LMS all use student perceptions as the key indicator for success. To depict a fuller picture of library services that students aren´t familiar with, further stakeholder views are needed. E.g. staff, domain-experts or management would be a valuable asset in such process since they possess specific knowledge of service utility and functionality. Hence, the aim of this study is to explore the effect of such multiple stakeholder-views when dealing with evaluation of electronic library services.

Design and Approach

This research has been conducted through a case study of students and librarians at the University of Southern Denmark. To attain multiple stakeholder-views two methods are introduced to evaluate respectively students' and academic library staffs' perceptions: the think aloud test and the heuristic expert evaluation.

The think aloud test, was applied to observe behaviour from a user-centred view. This approach was used to explore potential users' cognitive verbalisation through simulated use of the prototype. The verbal reports provided insights in both usability and user experience issues, bringing forth an important view from one stakeholder-group in particular: the users. The heuristic expert evaluation was initiated to assess functional aspects in the view of library staff. In general, the method is used in cooperation with domain and usability experts. In our case the domain experts are expected to possess knowledge about services represented in the prototype while the usability experts ensured to review general usability issues.

Findings

The think aloud tests shows usability issues regarding information-structure in relation to the content that causes confusion and lacking overview to the students. Moreover, all the participants indicate that the implementation of library services within LMS environments potentially will have a positive effect on students' access to the academic library, mainly because of the decreased selection of services.

The heuristic expert evaluation points out functional issues and the need of additional functions to support a more efficient use and experience of the services. Especially inconsistent use of language, information on how to pay overdue fees and

additional functions for loan management was in interest of the staff. Moreover, the evaluation shows the experts perspective on which services that are relevant in LMS-environments e.g. the importance of access to offline dictionaries for exam use.

Research or practical limitations or implications

The study reveals a methodological framework when evaluating implemented digital resources in LMS. However, there is a theoretical concern on how to assess causality between the effects of implementing these resources in e-learning environments and improvement of student's informational behaviour.

Conclusions

This study shows that by combining methods that aims to assess different stakeholder-groups, it is possible to provide insight into usability issues and the relevance of implemented services in LMS-environments. Furthermore, the study shows that the results from each methodology can act as complimentary elements. For instance, results attained from the think aloud test contributed with valuable aspects of what the users appreciated. In the conduct of the heuristic expert evaluation, this was applied as a valid argument for dealing with further decisions of picking, adding and removing services and elements from the LMS-environment. Moreover, the study has clarified essential aspects of stakeholder interest through the mixed conduct of evaluation methods.

Originality and value of the proposal

This study suggests an evaluation framework that ensures the practitioner to gain a full perspective when evaluating digital services implemented in LMS.

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Aligning public libraries' performance with Sustainable Development Goals

A strategic and evidence-based approach

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Introduction

Published in 1987, the Brundtland Report set out the most commonly quoted definition of *sustainable development*: "sustainable development is development that meets the needs of present without compromising the ability of future generations to meet their own needs" (United Nations, World Commission on Environment and Development, 1987, p. 43). Although some researchers argue that there is a conceptual distinction between *sustainable development* and *sustainability*, in line with Gray (2010) and Giovannoni and Fabietti (2013), we will use these concepts interchangeably, since we consider that both entail the same dimensions and the same implications in terms of policy and strategies.

In September 2015, the United Nations (UN) Member States adopted the 2030 Agenda for Sustainable Development setting the global, national and local framework for putting that responsibility into action (United Nations, 2015). The new global Agenda is formed by 17 Sustainable Development Goals (SGDs) which must be implemented by all countries until 2030, so that "no one will stay behind". The 169 associated targets are monitored and reviewed using a set of global indicators (Sustainable Development Solutions Network, 2015).

Sectorial organizations worked on bringing their potential contributions to sustainable development to the attention of Member States and the UN. In the post-2015 process, the International Federation of Library Associations and Institutions (IFLA) continued its active engagement towards promoting libraries within the UN 2030 Agenda and consolidated it in one of the Key Initiatives under the Strategic Directions set for 2016-2021 (IFLA, 2015). It should be stressed that access to information has been recognised as a target under SDG16 (target 16.10), culture and ICT have also been included in the SGDs (target 11.4 and targets 5b, 9c, 17.8, respectively) and universal literacy is recognised in the vision for the UN 2030 Agenda (IFLA, 2018).

In Portugal, initiatives to promote library and information services within the 2030 Agenda are still modest, as research intersecting Information Science with Performance Evaluation and Sustainable Development is not yet sufficiently developed. However, the recent advocacy strategy towards the promotion of libraries' role in the achievement of SDGs carried out by B.A.D. - the Portuguese Association of Librarians, Archivists and Documentalists should be highlighted. On the other hand, in November 2016, a team of researchers at the Faculty of Social Sciences and Humanities of Universidade NOVA de Lisboa (NOVA FCSH, Portugal) started a research project entitled Bibliotecas Públicas e Sustentabilidade: Recolha de Evidências da Contribuição para os ODS [Public Libraries and Sustainability: Gathering Evidences of Contribution to SDGs (Project PLS)] aimed at the development of a framework for evaluating public libraries' contribution to SDGs and tailor it to Portuguese public libraries (Pinto and Ochôa, 2018a).

Based on the outcomes of Project PLS, this paper discusses the role of strategy alignment and impact evaluation practices and competencies in the processes of gathering evidence and advocacy towards public libraries' contribution to the UN 2030 Agenda.

Strategy Alignment for Sustainability

Background and general methodological approach

Since 2012, researchers at NOVA FCSH/CHAM – Centre for the Humanities have been pursuing a line of research that intersects Library and Information Services (LIS) performance evaluation with sustainability transitions management and competences development. During the period 2013-2014, this intersection was put into practice in co-creation workshops on "Building a Sustainability Assessment Framework", directed at students of Library and Information Science courses. These interdisciplinary experiences led to the outlining of a draft conceptual framework for assessing the sustainability and impacts of LIS, which was further consolidated (Ochôa and Pinto 2014) and expanded by introducing the standard ISO 16439 (2014), as well as media and information literacy evaluation perspectives (Ochôa and Pinto, 2015).

The intensification of IFLA's advocacy initiatives towards global sustainability after 2013 (for example, *IFLA Statement on Libraries and Development,* 2013; *Lyon Declaration*, 2014), together with the international adoption of the Post-2015 Development Agenda (United Nations, 2015) in September 2015 and the release of the *Final List of Proposed Sustainable Development Goal Indicators* (United Nations, 2016) in June 2016 highlighted the need for providing the LIS community with methods and tools [1] for measuring as well as evaluating its contribution to sustainable development. Other IFLA initiatives towards professional capacity building were also an inspiration: Building Strong Library Associations (BSLA programme, 2012) and the International Advocacy Programme (IAP, 2016) [2]. According to Streatfield and Markless (2019), IFLA consistently developed programme impact evaluation, giving a lead to the library and information community worldwide, particularly in relation to public library evaluation.

In November 2016, a team of researchers at NOVA FCSH, willing "to think globally, but act locally" and looking for an answer to the question "How can public libraries gather evidences and evaluate their contribution to Sustainable Development Goals?", initiated a research project named Bibliotecas Públicas e Sustentabilidade: Recolha de Evidências da Contribuição para os ODS [Public Libraries and Sustainability: Gathering Evidences of Contribution to SDGs (Project PLS)]. Project PLS aims to develop a framework (model) for evaluating public libraries' contribution to SDGs and tailor it to Portuguese public libraries.

Evaluation research and evidence-based theory provided the general framework for Project PLS. The research question was addressed through an eminently qualitative methodology supported by the combination of two principal methods: literature review and construction/application of conceptual models as well as tools for analysis. The literature review process was complemented by a questionnaire that analyzed Portuguese public libraries' involvement in SDGs international, national and local initiatives.

An integrated and holistic approach was used to build the Model for the Alignment and Evidence Gathering of Libraries' Contribution to Sustainable Development. It is important to clarify the underpinning concept of *evidence*: it can be any type of information or data used to help answering a question; the information / data collected becomes evidence when it is used to demonstrate library's contribution(s) to sustainable development, to determine goal or target achievement, to show the alignment initiatives adopted or to understand its various impacts on stakeholders (adapt. from Bill & Melinda Gates Foundation, 2015).

In the alignment process, the use/adaptation of library assessment data was valued: UN Global Indicators and the corresponding Portuguese national indicators (whenever possible), as well as of ISO 11620 – *Library performance indicators* and ISO 16439 - *Methods and procedures for assessing the impact of libraries*, complemented by the *Global Libraries Impact Planning and Assessment Guide* (Bill & Melinda Gates Foundation, 2015), the *Generic Learning Outcomes* and *Generic Social Outcomes* (Arts Council England).

The Model for the Alignment and Evidence Gathering of Libraries' Contribution to Sustainable Development was consolidated and expanded within another project ran by B.A.D. in conjunction with IFLA, under IAP - the Project Libraries for Development and the UN 2030 Agenda (April- July 2018). In order to accelerate library and information professionals' involvement in the systematic process of evaluating and promoting libraries' contribution to SGDs, a step-by-step *Guide for Libraries* (Pinto and Ochôa, 2018) was built on this Model and made available through B.A.D.'s website. One of the

Model´s tools – the Roadmap for the Alignment and Evidence Gathering of Libraries' Contributions to the 2030 Agenda – was tested in two workshops targeted at Portuguese public libraries' professionals (July 2018) and provided the framework for creating a national award related to sustainable development best practices in libraries of all types (October 2018).
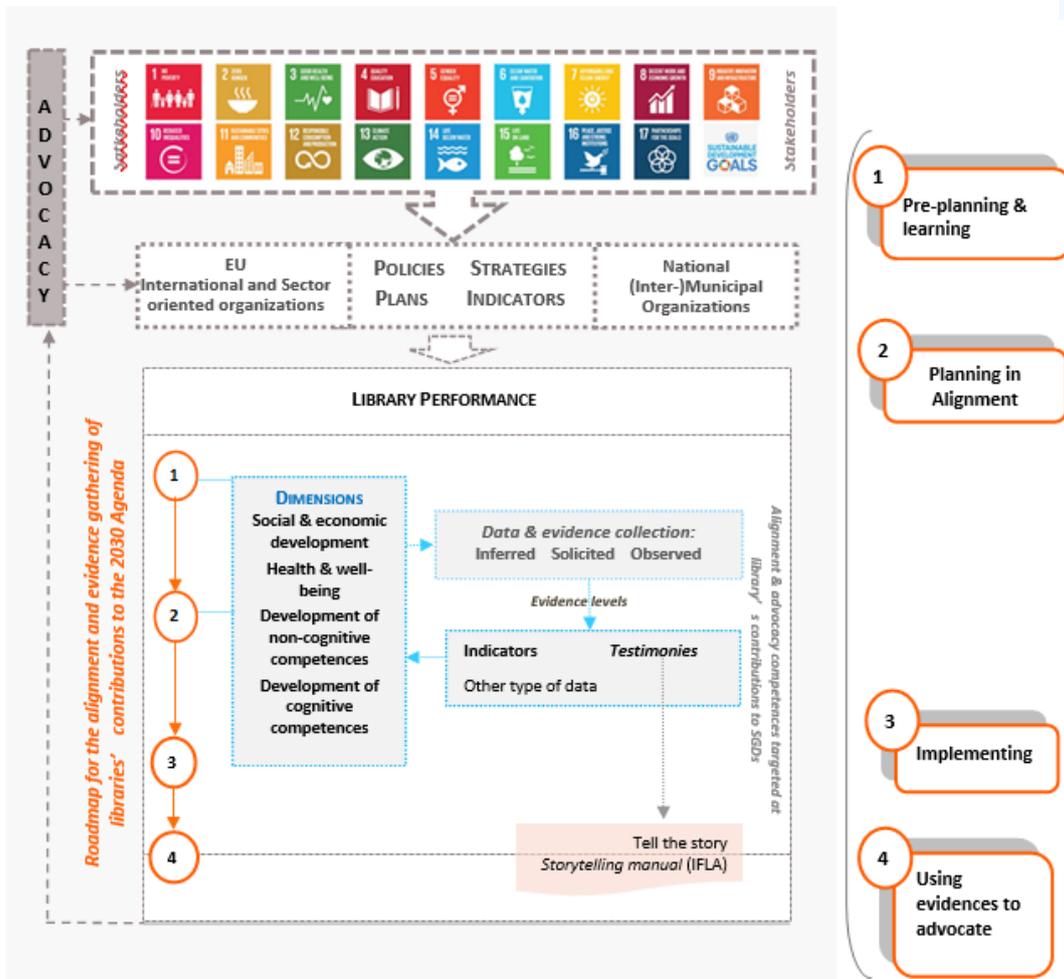
Figure 1 Model for the Alignment and Evidence Gathering of Libraries' Contribution to Sustainable Development

The Roadmap: a four-step process

The cornerstone of the Model for the Alignment and Evidence Gathering of Libraries' Contribution to Sustainable Development is a Roadmap that is anchored in the identification of potential (inter)relations between the Dimensions that frame impacts of library activities/ projects and the SDGs. The Roadmap supports the alignment cycles in four steps: Step 1 - Pre-planning and learning; Step 2 - Planning in the face of alignment; Step 3 - Implement measures and indicators; and Step 4 - Using evidence to advocate for libraries.

Step 1 - Pre-planning and learning

This first step intends to create the conditions for the implementation of the process that will allow libraries to obtain evidence of their contribution to drive forward the UN 2030 Agenda. Library and Information professionals need:

- To understand the architecture and main concepts of the Model for the Alignment and Evidence Gathering of Libraries' Contribution to Sustainable Development.

- To recognize and identify relevant strategic information that, at various levels, should be considered when aligning library's strategy(ies) with SDGs.

- To identify possible SGDs and alignment Dimensions for which the library contributes through its performance.

- To set up frequent communication channels with key stakeholders.

This process of competences development is reinforced by the inclusion in the *Library Guide* of supporting documents: a *Glossary* (alphabetical list of key terms used), a list of *Information sources* [suggestion of information sources relevant to the alignment of strategy(ies)] and the *Alignment map* (representation of potential (inter)relationship between Dimensions that frame possible impacts of library activities/projects and SGDs).

Step 2 - Planning in the face of alignment

Based on the information collected in the previous step, it is now time to take the decisions that will determine what evidence will come out of the alignment process. This requires the following actions:

- Identify, select and characterize services / activities considering the alignment of strategy(ies).

- Check the baseline state of the service / activity or aspect that is going to be developed / improved.

- Define the needs, resources (inputs), results and impacts related to these services / activities.

- Clarify the general reasons for gathering evidence.

- Select the alignment Dimensions and the results / impacts that will be measured.

- Define the SMART indicators (Specific, Measurable, Achievable, Relevant, Time-oriented) that will be used to assess whether the expected results / impacts have been achieved.

- Choose the adequate methods to gather data / evidence.

- Plan results report and communication.

The implementation of this step is backed by a supporting document on *Measures and Indicators* included in the *Library Guide*, which contains transversal measures and indicators potentially applicable to SGDs, along with examples of specific indicators, measures and other sort of evidence that are relevant to public libraries. The use/adaptation of library assessment data is recommended: UN Global Indicators and the corresponding Portuguese national indicators (whenever possible), as well as ISO 11620 – *Library performance indicators* and ISO 16439 - *Methods and procedures for assessing the impact of libraries*, complemented by the *Global Libraries Impact Planning and Assessment Guide* (Bill & Melinda gates Foundation, 2015), the *Generic Learning Outcomes* and *Generic Social Outcomes* (Arts Council England).

When defining indicators and selecting methods for collecting data / evidence, it is important to bear in mind the quality, robustness and suitability of the evidence that will be generated. As such, evidence can be structured and provided according to five levels [3], being Level 1 the minimum requirement that is expected and Level 5 the highest threshold. Level 1 only demands a clear description of the project / activity along with an explanation of its importance to the community and SGDs, while Level 5 implies the recognition of library's contributions to SDG by national and international entities. The progression up this scale reflects library's ability to plan the alignment of strategies according to evidence collection, reporting and communication options that were taken.

Step 3 - Implementing

At this stage, what was planned needs to be put into practice. Data is gathered and analysed and then the information that will be communicated is prepared. Several aspects need to be taken into account during the implementation phase, namely:

- Check / test selected data / evidence collection method(s) and make any necessary corrections.

- Regularly monitor the data collection process.

- Keep stakeholders informed about the development of the data / evidence collection process.

- Analyse the results and plan how to contextualize evidence according to the characteristics of library's target audiences.

- Build the "story" giving meaning to evidence that was obtained and prepare the report or other communication materials that demonstrate library's contribution in achieving SDGs.

Step 4 – Using evidence to advocate for libraries

The last stage of the Roadmap is focused on the effective use of evidence advocating for library's contribution to sustainable development and to the pursuit of the 2030 Agenda. To reinforce communication with stakeholders, library and information professionals are advised to follow IFLA's *Storytelling manual* recommendations (IFLA, Library Map of the World Team, 2018). This manual was designed to help library and information professionals in telling compelling stories about library activities and projects and its impact on the community they serve. It is a narrative tool that values the use of anecdotal evidence for impact assessment obtained from users, staff and other stakeholders. The SGDs story must provide answers to the following questions:

- Why? (Description of the problem or challenge in the community that library activity or project was designed to address).

- Who did what, how and when? (Description of the activity or project, including statistics whenever possible).

- So what? (Description of impact on user's lives and community and evidence of library´s contribution to local, regional, national or global sustainable development).

The contributions of narratives for improvement results is generally recognised. Streatfield and Markless (2019) flagged the collection of stories of change as a new interest within international development evaluation community in response to the growing frustration with the limitations of attribution studies and logic models of evaluation that takes little account of the complexities in achieving change.

Conclusions

In line with Streatfield and Markless (2019), we consider that systematic impact evaluation must articulate different levels and types of contributions to change. Thus, the Model for the Alignment and Evidence Gathering of Libraries' Contribution to Sustainable Development fosters a set of tools that values strategy alignment and impact evaluation practices and competencies in the processes of gathering evidence and advocacy towards libraries' contribution to the UN 2030 Agenda. One of those tools - the Roadmap - proved to be particularly useful in developing library and information professionals' alignment and assessment competencies, as well as in supporting public libraries' advocacy efforts towards their recognition as active and valuable partners in the development and implementation of national, regional and local strategies that will help delivering on SGDs.

In early 2019, the *Library Guide* was presented, discussed and tested by students undertaking the module *Performance Evaluation and Sustainability in Information Services* taught in the Master of Information Management and Curation (a partnership between NOVA FCSH and NOVA Information Management School). This approach to teaching and learning aimed to involve future information managers and curators in sustainable development theory and practice, enabling them to manage several kinds of strategy alignment (macro, *mezzo* and micro) and to (re)use / adapt indicators and statistical data through evidence gathering and processing.

As discussed previously, the role of strategy alignment and impact evaluation practices in the processes of gathering evidence and advocacy towards libraries' contribution to the UN 2030 can emerge from several perspectives:

- From library performance evaluation models, namely ISO 16439's systematization of methods and procedures for assessing impacts.

- From evidence management research and practices.

- From stakeholders' advocacy strategies and methods, namely storytelling;

- From sustainability management transitions, as a new governance approach based on the analytical perspective of transitions, namely transitions dynamics evaluation.

Since 2012, the line of research we have been pursuing at NOVA FCSH/CHAM, together with several teaching and learning experiences target at students looking for a career in Library and Information Management, but also at experienced library and information professionals, highlight the importance of further developing performance evaluation competences and enhancing stakeholders' active engagement throughout evaluation processes in the LIS context (Ochôa and Pinto, 2017; Ochôa and Pinto, 2019, 2019a). The matrix recently developed by Streatfield and Markless (2019) to help IFLA tracking the engagement with the UN SDGs through various stages (emergent, committed, engaged and integrated) and different types of evidence collection presents an interesting challenge facing the analysis on how these different expressions of evaluation cultures can influence the progression of Portuguese public libraries up this scale of engagement with the 2030 Agenda.

The 2030 Agenda and library performance evaluation pathways might be considered separate areas of interest and separate lines of research, nevertheless, in our opinion, the Model for the Alignment and Evidence Gathering of Libraries' Contribution to Sustainable Development offers a way of linking different perspectives, as a management tool and as an agenda for joint research with several stakeholders. In a future research agenda, communities of transdisciplinary and evaluative practices will be central to the creation of co-evaluation integrative models where different alignment strategies and evidences will be valued to deal with the complexity of new open evaluation processes.

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Notes

[1] More information about this project is available at https://bad.pt/agenda2030/.

[2] More information about these initiatives can be found in, respectively, https://www.ifla.org/bsla and https://www.ifla.org/ldp/iap.

[3] Adapted from Nesta's *Standards of evidence* (Puttick & Ludlow, 2012).

Understanding User Experience in Bring Your Own Device spaces in the library

A case study of space planning and use at a large research university

Zoe Chao, Steve Borrelli, Bikalpa Neupane

Penn State University Libraries

Abstract

Purpose - This multi-dimensional study, triangulates qualitative and quantitative data with existing data to inform on the function and user experience of a newly created the "News Library." Further, to inform on the viability of "bring your own device spaces" (BYOD) in meeting the computing needs of Penn State University Park students.

Methodology - This study leverages several methodologies for data collection, including observation, survey, flip chart prompts, interviews, and focus groups.

Findings - Findings suggest that the News Library accommodates the social needs of users. However, it does not accommodate their communal needs well. The majority of students at the Penn State University Park campus, own laptops, and bring them to the library when they intend to study. That personal device usage is preferable to library-provided computers per a familiarity with their personal device, access to personal files, and independence of workspace.

Practical limitations – As this is a case study, the findings are not generalizable. This study was conducted in one library setting, on one campus of a twenty-four campus institution with a total of over 30 libraries.

Conclusions – Results demonstrate that the News Library expands the footprint of space available to students and accommodates social needs. The flexibility and mobility of using personal laptops in the library were highly valued per the associated sense of intimacy and connectedness with their devices, suggests that BYOD is a viable approach for library space planning.

Originality and value - The mixed-methods study provides multiple views into user behaviors and expectations. Authors propose guidelines for informing the design of BYOD spaces.

Submitted to Open Access journal, so not included in Conference Proceedings.

Library Transformation: "Small Libraries Create Smart Spaces"

Project Evaluation

Martha Kyrillidou

QualityMetrics LLC

Abstract

Purpose

This paper will report on the QualityMetrics evaluation of the two-year IMLS grant received by OCLC and the Association for Rural and Small Libraries that aimed at working with rural and small libraries in engaging with their communities and redesigning their spaces using a design thinking training process that was developed as part of the Webjunction platform. The *Small Libraries Create Smart Spaces* (Small/Smart) grant [1] guided and supported 15 small and rural public libraries as they reimagined and reconfigured library spaces to support socially engaging and active learning programming that addresses a defined community need. Participating libraries, serving communities of 25,000 or fewer individuals, received facilitated instruction and collaborative peer-learning support through an online community of practice managed by the WebJunction project team.[2] The project goals were to facilitate participating small libraries to:

- foster social connection among their community members to form strong communities;
- create library spaces that provide active learning that encourages exploration and play;
- be prepared to quickly adapt the use of their physical space in response to evolving community needs and interests; and
- magnify their key role in providing learning outside of the formal classroom, for all ages

Design, methodology or approach

The evaluators worked with WebJunction project team to document and implement a comprehensive evaluation strategy, which aligns with **project goals** and **funder performance goals**. We supported WebJunction project team in visualizing their selections and consulted in the design and implementation strategy for indicators and measurement tools to measure participant progress towards those their learning objectives as developed by OCLC and their subject matter experts. We implemented pre-and post- implementation evaluation as well as interim assessments in a participatory and engaging fashion associated with each key phase of participant learning and project implementation. We also provided instruction/support to individual libraries as they identified measurable objectives and accessible evaluation strategies for gathering community member input regarding their perspectives of and learning experiences in the transformed library space. The evaluator served as a subject matter expert to support the

WebJunction project team in designing/delivering that instructional support of the evaluation phase. The evaluator also worked with the WebJunction project team to identify an effective process for libraries to gather and share community input back to the project team that informs the specific objectives of each library, AND the overall Small/Smart project objectives. The evaluators worked with the libraries to support the analysis of this community-level input.

Findings

Participants were surveyed in the beginning of the project and at the end of the project by the evaluators on the project goals and perceived effectiveness of the library regarding active learning. We used the same effectiveness, importance, and satisfaction questions in the beginning and at the end of the project which allowed us to identify improvements over time and through the intervention of the curriculum engagement, the learning taking place in the online environment, and the implementation of the action plan. In answering, the question "how has the way your library engages with the community changed since you began participating in the Small Libraries Create Smart Spaces program", participants said:

> We are more open to new (outside) ideas and suggestions. People
> are more outspoken and willing to give us their suggestions.
> People seem to feel more at home!
> We are now accepted and received as "help and hope for
> tomorrow" and not just "existing".

Major findings from these surveys indicate that the grant was a remarkable success and improvements were achieved in all areas. One of the participating libraries received a national award.

Research and practical implications/Conclusions

The grant demonstrates that library transformations can happen in very effective and efficient manner with outstanding results, high local impact, and national recognition even for small and rural libraries. IMLS has funded another round of this grant that is currently underway.

The WebJunction curriculum can serve other libraries in the future. The evaluators recommend that some form of coaching and support like the support provided by the project leaders and the evaluators would be useful to engage in future offerings. Publishing some of the findings as case studies would also be very useful (and it did get done by OCLC).

There is some room for improvement in recognizing how integral community involvement is especially as a systematic way for engaging in a periodic fashion. The libraries that already had some form of strategic plan in place were further ahead in being able to maximize the benefits from this grant. There may need to be a level 2 offering for some of these libraries that are more advanced in the design of library services. They can be introduced into community facilitation mechanisms like world cafes and kitchen sink conversations for example.

Last but not least, some form of dissemination was recommended so what is happening in small and rural libraries becomes part of the national discourse of the library assessment and evaluation literature. Design thinking has influenced many types of libraries from large academic to large public to small academic to small public libraries. Lessons learned across these cohorts are not always easy to bring together as the funding for professional development and the norms for peer review and dissemination differ among these communities.

The evaluators would like to encourage cross-fertilization of such findings across library communities because we are more connected at the hyper-local level, while we are also more connected at the regional, state, and global levels. Connections are increasingly important at all levels and they can result in beneficial outcomes for communities across the rest of the US as this grant has achieved across 12 different states.

Originality

Research on small and rural libraries is not as heavily disseminated and in that respect this paper fills an important gap in the assessment literature.

Small Libraries Create Smart Spaces: Overview

Fifteen small U.S. public libraries were selected to participate in the Small Libraries Create Smart Spaces project led by OCLC WebJunction in partnership with the Association of Rural and Small Libraries (ARSL). The libraries *engaged with their community members to discover authentic needs and co-create library spaces and services for active learning.*

Our working definition of active learning is:

> *Active learning positions learners of all ages as co-creators of knowledge and experience. It is participatory, informal, interest-driven and relevant to real life. Active learning emphasizes the vital connection between interests, peer interaction, and learning content, and adheres to four learning principles:*

> *Everyone can participate.*

> *Learning happens by doing.*

> *Challenge is constant.*

> *Everything is interconnected.*

The libraries, chosen from 106 completed applications, are in 12 different states and serve communities ranging in size from 560 to 21,000 people. They were supported and engaged over the period of the grant through live-online sessions and an online learning environment (community of practice). Beginning with an introduction to the big picture concepts and practical examples of active learning and space transformation in small libraries, the program used the learning platform to guide and inform the phases of participant projects.

The 15 selected participants are listed in the map below and they represent locations in the West (3), Midwest (4), Southwest (1), Northeast (5), and Southeast (2). The following map shows all the locations of the participants:
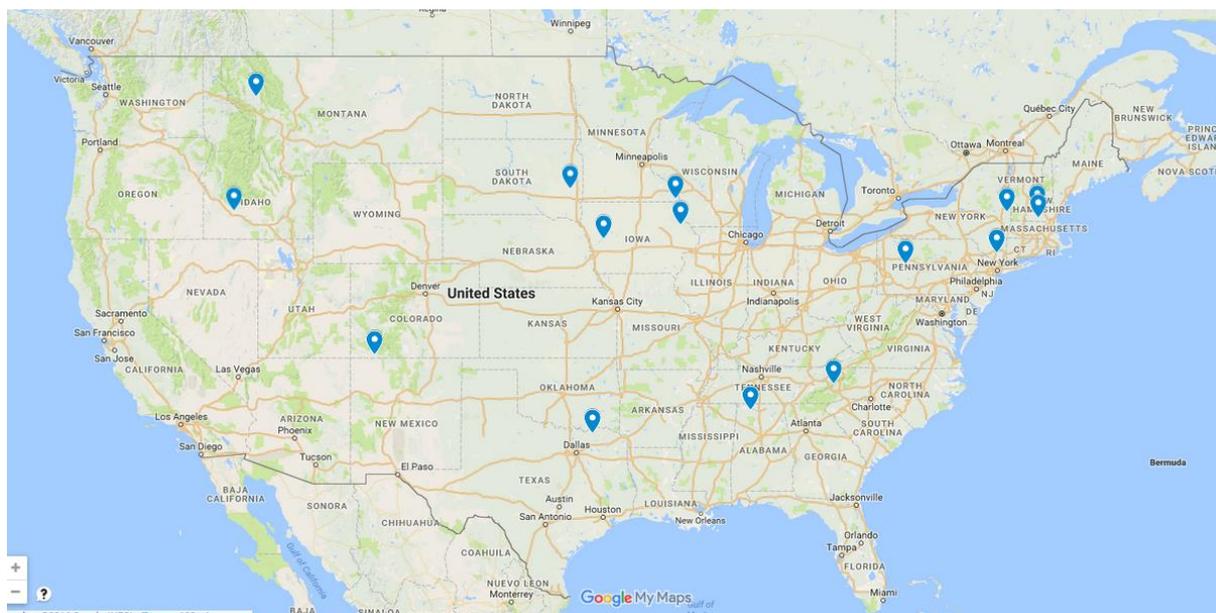
Figure 1. Small Libraries Create Smart Places Map – 15 Participating Libraries

Goals of the evaluation

The evaluation plan emphasized both process (input, activities and outputs) as well as outcomes assessment for the grant activities. It was framed around the goals of the grant and corresponded to the Participants and Community Engagement Plan that included interviews with the participants in Feb and March 2018. The *Participants and Community Engagement Plan also served as the logic model* for our grant.

Each participant customized the logic model to reflect their own experiences and thus develop their own evaluation outcomes-based logic model. The ENGAGE AND EXPLORE phase was heavy on exploration of potential outcomes for the participants. OCLC staff gave an introduction to Outcomes-Based-Evaluation (OBE) in the first and second live sessions the group held, and Quality Metrics offered a formal introduction to outcomes assessment at the second phase, DISCOVER, PROTOTYPE AND PREPARE and we worked with them to capture desired *learning outcomes for their specific communities* which they developed through their engagement in their own discovery and co-creation with their community members. Our goal as independent evaluators was not to create 15 different evaluation plans but to enable each participant to write such a plan and execute it in the context of the OCLC grant activities and goals. Process evaluation throughout the duration of the project also ensured that the level of inputs, activities and outputs were appropriate within the context of the specific library and community to achieve the stated outcomes.

By working closely with the grant management team, we ensured that data are gathered in a formative and iterative fashion to improve the process of the interactions with the participants (process evaluation). We engaged in assessing how the stated outcomes of the overall project are achieved with a pre- and post-survey design. The expectation was that all participants target and achieve *some* of these outcomes as refined in their local context possibly for targeted parts of their community:

1. Through community engagement and active learning activities, libraries will foster social connection among people to form strong communities
2. Libraries will create a space to provide active learning that encourages exploration and play
3. Libraries will be better prepared to adapt the use of their physical space in response to evolving community needs and interests
4. Libraries will magnify their key role in providing active learning outside of the formal classroom for all ages
5. Libraries will recognize how their knowledge, resources and experiences from the project will broadly benefit other small and rural libraries; OCLC WebJunction will ensure that the experiences from these 15 libraries are shared broadly with small and rural libraries that can learn from them.

In particular, our evaluation engaged in the following activities mapped on the logic model developed by OCLC in the grant application:

The evaluators worked with	OCLC and did the following so THAT	Participants did the following:
ENGAGE AND EXPLORE Jan – April, 2017	Identify and engage OCLC team by reviewing application materials, held phone call and conversations on refining the evaluation Focus the evaluation: prepared an evaluation plan Pre-assessment: launched a survey directly measuring the desired grant outcomes	Sharing information among grantees - learning more about each other Engaged local stakeholders: generated ideas for outcomes and projects, identified potential partners Participants developed a good idea of what they want to do by the end of this phase.
PROTOTYPE and PREPARE FOR CHANGE (May – June 2017)	Monitored community activities and provided input on learning modules	Described the *potential* Program (prototype); rudimentary mockup and testing of an idea; refined

	incorporating evaluation components. Introduced participants to outcomes-based evaluation and help them identify an outcomes-based evaluation plan for their projects	them and implemented additional major changes
TRANSFORM and LEARN July 2017 – April 2018]	Offered a webinar on outcomes-based evaluation and introduced the input-output-outcomes evaluation model; encouraged each participant to develop their own local version of this logic model. Reviewed the logic models of each participating library through a phone call consultation. Followed up phone calls midstream (Jan – March) on project status and evaluation.	Described the program (action plan); Finalized the logic model for their program/activities Focus the evaluation design Understand pros and cons of diverse ways of gathering evidence
SUSTAIN May 2018-June 2018	Final post-survey evaluation launched; Summative report of lessons learned, best practices and future improvements.	Gathered credible evidence Supporting conclusions Ensuring lessons learned are shared and used

Purpose and Stakeholders

Purpose: Participants engaged with their community members to discover authentic needs and co-create library spaces and services for active learning. This project builds upon the success case studies from the Transforming Library Spaces projects Webjunction supported:

- **Case Study: Bellingham Public Library**
- **Case Study: Everson Branch Library**
- **Durable Transformation: Library Spaces Continue to Activate Community** is a report on those spaces two years later

Stakeholders at the local level helped:

- determine and prioritize key evaluation questions,
- pretest data collection instruments,
- facilitate data collection,
- implement evaluation activities,
- increase credibility of analysis and interpretation of evaluation information, and
- ensure evaluation results are used.

Each library was represented by a staff member, who was guided through a training program designed by WebJunction, the public library learning program of OCLC. Participants applied what they learned about reimagining and reconfiguring library spaces to support socially engaging and active learning programming that addresses a defined community need. As Sharon Streams, Director, WebJunction, noted "There libraries were chosen based on a well-articulated understanding of their communities, commitment to championing economic and educational success, and an enthusiasm for bringing the voice of community members to their planning process." The goal was to work with these libraries as they create spaces that encourage people to explore, play, and learn together. During the 18-month period that followed, participants were introduced to the principles of placemaking, community discovery, and human-centered space design. They actively sought community input, conducted action planning and prototype activities, and implemented a learning space using modest subgrants to purchase furnishings and materials.

There was some staff turnover in a couple of these institutions which affected the timeline of the implementation of their projects. Most of the participating institutions had stable leadership throughout the project.

Describe the program

A program description clarifies the program's purpose, stage of development, activities, capacity to improve and implementation context. The description below identifies detailed objectives for the various stages of the grant.

Curriculum Outline

The Smart Spaces cohort was oriented and supported over the extended period of the program through live-online sessions and an online learning environment (community of practice). Beginning with an introduction to the big picture concepts and practical examples of active learning and space transformation in small libraries, the program used the learning platform to guide and inform the phases of participant projects. Live online sessions were a combination of presentation, activity and time for questions, and reinforcement of the information. Throughout the orientation, subject matter experts and experienced practitioners were engaged to inform, mentor and spark confidence. Participants had specific self-directed activities by which they applied their learning in the intervening time between webinars. Some of these were within the online community of practice and others involved independent action and interaction with their library communities. Below is an outline of the curriculum.

Phase 1 Engage & Explore; February – April 2017

Lesson One: Small Libraries *Can* Create Smart Spaces

Learning objectives (as a result of learning, participants will be able to...)
- Recognize and articulate the pressures on the library to shift its role in their communities
- Know the characteristics and benefits of active learning and the value of the library as informal learning space
- Know the characteristics of placemaking and the intersection between space, place and active learning
- Articulate the value of active learning and library as learning place to library stakeholders
- Use case studies and resources provided to begin thinking of possibilities for their communities and areas of potential change in their libraries

Lesson Two: Inspired Planning with your Community

Learning objectives (as a result of learning, participants will be able to...)
- Recognize effective strategies for authentic community discovery
- Utilize appropriate tools, methodologies, strategies for authentic discovery of community needs and interests *Related specifically to active learning opportunities at the library*
- Use community data sources to describe community and identify target audiences of discovery (reaching out to non-users as well as library users)
- Conduct community discovery activities
- Recognize the value and potential contributions from partners and volunteers

Phase 2 Prototype & Prepare for Change; May – July 2017

Lesson Three: Flexing your Space

Learning objectives (as a result of learning, participants will be able to…)
- Understand the principles of general process of human-centered design and design thinking
- Re-envision the use of library space and the characteristics of engaging spaces in a manner that supports community activities
- Designate and clear a space in the library to prepare for prototyping
- Synthesize community input to identify patterns and priority needs for use of library spaces

Lesson Four: Design Thinking and Prototyping

Learning objectives (as a result of learning, participants will be able to…)
- Synthesize community input to identify patterns and priority needs
- Apply the concepts of the inspiration and ideation process to what was learned through community input
- Learn how a prototype process works and why it is valuable
- Apply process and tools; assess and adjust

Phase 3 Transform & Learn, July 2017 – April 2018

Action planning

- Participants learn how to interpret and incorporate the feedback from the prototype process and formulate an action plan for creating their library's new "smart space"
- Live-online sessions will orient participants to general best practices for finding/approaching partners, utilizing volunteers, detailing materials and drafting a budget; participants then take these steps on their individual plans (provide detailed template)
- Project staff and SMEs available for review and guidance on action plans for space transformation *and* active learning programming
- Participants request materials support from WebJunction

Implementation

- Project staff and SMEs will provide ongoing support of the cohort through the implementations and several months after in order to observe, measure and gather data on the usage of and community response to the newly created space

- Final live-online session will allow participants to show off their projects

Methods of Engaging Participants

Libraries participated in the curriculum and its activities through the online space until summer 2017. WebJunction project staff were readily available and helpful providing a rich interaction and guidance to participants as they were testing and implementing new ways of engaging their library users. Project leaders modeled the active learning engagement they encouraged the libraries to develop.

Once they completed the curriculum, they were engaged systematically in outcomes-based evaluation training and developing an action plan for this project and OBE logic models.   These models were developed through phone call consultations and, frequently, email follow up with the project evaluators. Most participants found the process of developing an OBE model by emphasizing the outcomes and back tracking into output and inputs insightful and useful. They used these models as part of the action plans they implemented and provided to the WebJunction project leaders in addition to budgets and timelines. Furthermore, WebJunction project leaders implemented a brief survey to gauge the status of disbursing funding in each location and ensure that benefits are maximized.

Between January and March 2018, the evaluators scheduled phone calls and discussed in detail the space activation process and evaluation with the libraries. Major findings from these phone calls are summarized in the Space Activation Evaluation in the next section. Furthermore, WebJunction project leaders did a series of site visits at participating libraries as a way of gaining insights for developing a fuller description of case studies.

Participants were surveyed in the beginning of the project and at the end of the project by the evaluators on the project goals and perceived effectiveness of the library regarding active learning. We used the same effectiveness, importance, and satisfaction questions in the beginning and at the end of the project which allowed us to identify improvements over time and through the intervention of the curriculum engagement, the learning taking place in the online environment, and the implementation of the action plan. These surveys are called 'pre-survey' and 'post-survey'. In addition to the Likert-scale survey questions, there were comments, qualitative evidence, providing insights and context on the library experiences. Major findings from these surveys are summarized in the Pre- and Post- Survey Evaluation in the next section.

Overall, the curriculum and the learning experiences and action plan implementations were a remarkable success with the occasional challenges of staff changes in a couple of libraries which were handled effectively with appropriate accommodations and adjustments. The next section summarizes the findings from the qualitative and quantitative evidence we collected through the methods outlined here and the section on Sustainability and Dissemination offers recommendations for future steps.

Qualitative and quantitative evidence

The fifteen small libraries represented in this project have small budgets and staff resources (Appendix B) and only eight of them have librarians with an MLS degree. Some of them are located in areas where the economy has declined in recent years. The WebJunction curriculum, the IMLS funds for the activation of the space ($5,000 per library), and the online community they formed were integral in the success of the project. During their participation in the Small Libraries Create Smart Spaces project, participants were introduced to concepts and processes related to active learning, placemaking, and community discovery. They were able to change their own thinking, and as a result their community's thinking, about what services and support the library can provide. The design thinking principles allowed them to bring to life innovative approaches to service development.

In particular, the library staff were able to gain new insights on the needs of their communities through the new ways of engaging the public and co-creating. Participants noted in their feedback that going through the ideation process really made them stop and think about possibilities they had not considered offering beforehand. Many were able to expand the traditional educational mission of the library with the lifelong learning concepts that encompass life skills that community members can offer to each other. The concept that every member of the community can step into leading a program in the library ranging from yoga classes to cooking classes to more formal STEAM kits, 3-D printing, and other endeavors gave new vitality to these places.

In a few cases, they were able to leverage the funding they received from this grant and energize their Boards to raise additional funds or apply for other grants, sometimes successfully and sometimes not so. It was evident that planning is critical to success in that at least one library that had already a strategic plan in place did not feel that the project 'changed their thinking' but the majority of the libraries that did not have that foundation built already were able to use the design thinking process to establish a foundation for thinking strategically, flexibly, and productively with their communities.

Here are some of the ways the participants described what they learned through the grant activities:

> The depth of the community surveys and discussions was a real eye-opener for us. I had been previously involved in several community engagement projects and thought I knew what my community wanted. Involving my board in these discussions gave them a whole new insight into what I had been trying to convey to them - hearing it from the people directly made a huge difference! I give this project total credit for kick-starting our capital campaign and getting things moving! The program not only introduced me to all the different things that can be possible in libraries, it gave me a wide understanding of where libraries are moving in the

future and the importance of assessing my own library and how I will adjust to keep with these trends.

Space activation evaluation results

Between January and March 2018, the evaluators scheduled phone calls and discussed in detail the space activation process and evaluation with the libraries encouraging them to continue the OBE process into the future. Major findings from these phone calls include a sense of who is benefiting from these programs, a sense of the vision of the redesigned spaces, a timeline and general sense of how the space looks and feels, how the community will benefit, and how the library will know that what they have done is working. Furthermore, WebJunction project leaders did a series of site visits at participating libraries as a way of gaining insights for developing a fuller description of case studies.

In terms of who would benefit, there was a general sense that more than half of the libraries were trying to engage the teens/tweens in their community in addition to making the space active for other groups as well. This was confirmed also from the pre- and post- survey data below. Oftentimes, these small libraries are working closely with the schools and offer an alternative to school-age children when their schools do not have libraries. By making the space more welcoming to teens and older adults, the libraries were able to attract others in the community. For example, including a big TV on the wall draws the attention of everybody. Most of the spaces were indoor active learning spaces, though we did have one library that designed an outdoor active learning space where they are hoping to have fully engaged as the weather gets better for "gathering, participation, and performing." By creating an active outdoor environment with 20 story trail boxes, they are hoping to engage people as they are coming at the entry to the space. They are installing lighting/wiring for security cameras and have an area for interactive outdoor instruments as a performance corner. Their goals is to offer concerts and open mike events with keyboard and drums located there all the time in addition to other maker activities including garden beds, a little free library, and art oriented programming. They are envisioning the outdoor space (the "Smart Park") will be used even when the library is closed. Some libraries already started seeing a difference with people staying longer and their Boards recognizing they are making a bigger difference with more intergenerational uses. They are seeing people coming that they would not have seen otherwise, for example spaces that give opportunities for dads to come in and engage with their kids: "People came on Super Bowl Sunday for an open house – 40 people."

In another library, the evaluation interview at the beginning of the project raised awareness that there was not a website for the library; by the end of the grant they 'got a website for the first time.' In a community that was hard hit economically, the library started being the pride of the community by doing exhibits on notable people from the local community and giving pride to the patrons in that the library is THEIRS!

In a couple of these settings, the libraries had to remove overcrowded underutilized shelving by ripping out old shelves and creating comfortable spaces. Oftentimes, the new space used bright and colorful tones and, in every instance, it was more welcoming. As the spaces are more attractive, the libraries were finding that the users were bringing other users: "we used to get 10 kids after school. In the last month since things have opened we double or tripled our numbers. The kids are posting about the library on snapchat. Kids are recruiting other kids. Kids are bringing other kids."

In another instance, an old trailer storing old VHS tapes was transformed to be a place for adult learning. Requests to offer classes for English and Spanish was made. So, the library is looking into developing more adult education opportunities and change fundamentally the perception of the library in the community. In the Ignacio Community Library, they opened an underutilized room so that is open all the time, welcoming parents and grandparents, and they are hoping that the library can help realize economic benefits for people who could do art shows and learn new skills: "Any patron developing enough skill can teach other patrons." They are seeing the possibility of measuring increases in the confidence for learning new skills across the community. Libraries are seeing the possibilities that programs do not need to be necessarily staff-driven. The library space can serve as a catalyst. In the Bertha Voyer Memorial Library, the project had a profound impact as everyone started talking about what the library could be. The Board started a capital campaign raising more funds and the library changed its name to the Honey Grove Library and Learning Center.

Pre- and Post- Survey evaluation results

Participants were surveyed in the beginning of the project and at the end of the project by the evaluators on the project goals and perceived effectiveness of the library regarding active learning. We used the same effectiveness, importance, and satisfaction questions in the beginning and at the end of the project which allowed us to identify improvements over time and through the intervention of the curriculum engagement, the learning taking place in the online environment, and the implementation of the action plan. These surveys are called 'pre-survey' and 'post-survey'.

In answering, the question "how has the way your library engages with the community changed since you began participating in the Small Libraries Create Smart Spaces program", participants said:

> We are more open to new (outside) ideas and suggestions. People are more outspoken and willing to give us their suggestions. People seem to feel more at home!

> We are now accepted and received as "help and hope for tomorrow" and not just "existing".

Major findings from these surveys indicate that the grant was a remarkable success and improvements were achieved in all areas. The average scores on the effectiveness questions were as follows:

Question: On a scale of 1 to 9 with 1 representing "Not at all effective" and 9 representing "Very effective," how would you rate your library on each of the following statements BEFORE/AFTER your participation in the prog ram?		BEFORE Post-Survey Average score (1=low, 9=high) n= 12	AFTER Post-Survey Average score (1=low, 9=high) n= 12
My library fosters social connection among people through activities and programming		5.5	8.0
My library has a space to provide active learning that encourages exploration and play		4.2	8.5
My library has reallocated spaces in response to community needs and interests		4.8	8.3
My library offers services and activities to encourage community members to learn together		5.3	8.0

	Post-Survey How IMPORTANT is it for your library to.. (1 = not all, 9= Very) N= 12	Post-Survey After participating in the Smart Libraries Create Smart Spaces, how SATISFIED are you currently with your library's ability to... (1 = not at all, 9 = Very) N= 12	Pre-Survey How SATISFIED are you currently with your library's ability to... (1 = not at all, 9 = Very) N= 15
Have a comfortable and inviting place for people to gather	8.9	8.3	6.2
Actively engage community members in planning programs and activities for the library	8.6	8.0	5.1
Ask community members for their feedback systematically and regularly (every month, year, etc.)	7.8	7.8	4.0

| Design programs and activities based on direct input from community members | 8.7 | 8.6 | 5.5 |
| Have a space where exploration and play takes place | 8.8 | 8.3 | 5.2 |

The findings indicate that participants recognize the importance of the goals set in the grant. Both importance and satisfaction ratings are almost 8 points and above on every item in the post-survey. The satisfaction scores regarding the library's ability to have a comfortable and inviting place, to actively engage community members, to collect feedback systematically, to design programs and activities based on direct input from community members, and to have a space for exploration and place were typically two to three points lower in the pre-survey. The pre- and post- survey satisfaction scores demonstrate an enormous difference in the way libraries understand active learning, engagement, and community involvement.

The post-survey results show that libraries are satisfied with their performance even though there is some room for slight improvements (satisfaction average scores are a tiny bit less than importance scores, yet as mentioned earlier all of them are close to the top rating of 9 points). As libraries have more time to implement the active learning strategies in future months and years, they will undoubtedly grow and evolve as their representative quotes below indicate:

> As stated previously, "before" we were viewed as "just existing" whether it was from lack of information or inspiration. "After" opened us up to information, inspiration, motivation and exploration and in turn has given "hope" to our under-served and under-utilized community.

Sustainability and Dissemination

It is important to continue to celebrate community involvement and successes and find a way for this cohort of libraries to continue to communicate among themselves as well as with other small and rural libraries in the future. These small libraries cannot travel to conferences as easily and have in person professional development, so offering an online forum where exchanges, growth, and improvements can be shared in the future would be a great way to sustain the program beyond the grant.

The WebJunction curriculum can serve other libraries in the future. The evaluators recommend that some form of coaching and support like the support provided by the project leaders and the evaluators would be useful to engage in future offerings. Publishing some of the findings as case studies like the prototype studies we built upon would be very useful.

There is some room for improvement in recognizing how integral community involvement is especially as a systematic way for engaging in a periodic fashion. The libraries that already had

some form of strategic plan in place were further ahead in being able to maximize the benefits from this grant. There may need to be a level 2 offering for some of these libraries that are more advanced in the design of library services. They can be introduced into community facilitation mechanisms like world cafes and kitchen sink conversations for example.

Last but not least, some form of dissemination at appropriate conferences would be very useful so what is happening in small and rural libraries becomes part of the national discourse of the library assessment and evaluation literature. Design thinking has influenced many types of libraries from large academic to large public to small academic to small public libraries. Lessons learned across these cohorts are not always easy to bring together as the funding for professional development and the norms for peer review and dissemination differ among these communities.

The evaluators would like to encourage cross-fertilization of such findings across library communities because we are more connected at the hyper-local level, while we are also more connected at the regional, state, and global levels. Connections are increasingly important at all levels and they can result in beneficial outcomes for communities across the country as this grant has achieved across 12 different states.

References

[1] https://www.webjunction.org/explore-topics/smart-spaces.html
[2] https://www.imls.gov/
https://arsl.info/
https://www.oclc.org/en/webjunction.html
http://qualitymetricsllc.com/

Appendix A: Library address and websites

Library	Address	City/town:	State	ZIP	WEBSITE
Bertha Voyer Memorial Library	500 6th ST	Honey Grove	TX	75446	http://honeygrove.fatcow.com/BVML%20Web%20Pages/
Caledonia Public Library	231 East Main St.	Caledonia	MN	55921	https://caledonia.lib.mn.us/about-us/
Cornwall Public Library	395 Hudson Street	Cornwall	NY	12518	http://www.cornwallpubliclibrary.org/
Glenns Ferry Public Library	PO Box 910	Glenns Ferry	ID	83623	https://www.glennsferryidaho.org/city/departments/library/
Greenwich Free Library	148 Main St	Greenwich	NY	12834	http://www.greenwichfreelibrary.com/
Hot Springs Library	PO BOX 175	Hot Springs	NC	28743	
Ignacio Community Library	470 Goddard Ave.	Ignacio	CO	81137	http://ignaciolibrary.org/
James Kennedy Public Library	320 1st Ave. E.	Dyersville	IA	52040	http://www.madisonpubliclibrarysd.com/
Madison Public Library	209 East Center Street	Madison	SD	57042	http://www.madisonpubliclibrarysd.com/
Norelius Community Library	1403 1st Ave S.	Denison	IA	51442	http://www.denison.lib.ia.us/
Punxsutawney Memorial Library	301 East Mahoning Street, Suite 4	Punxsutawney	PA	15767	http://www.punxsutawneylibrary.org/
Ronan Library District	203 Main Street SW	Ronan	MT	59864	http://ronanlibrary.org/
Town Creek Public Library	15971 Main Street	Town Creek	AL	35672	http://aplsws1.apls.state.al.us/towncreek/
Tucker Free Library	31 Western Avenue	Henniker	NH	3242	http://www.tuckerfreelibrary.org/
Wilton Public and Gregg Free Library	7 Forest Rd PO Box 420	Wilton	NH	3086	http://www.wiltonlibrarynh.org/

Appendix B: Library profiles: IMLS Public Library Statistics FY2016

The following data are retrieved from the IMLS website: https://www.imls.gov/labs/ (as of 5/30/2018)

1. **Bertha Voyer Memorial Library**, Honey Grove, Texas, population served 1,670

BERTHA VOYER MEMORIAL LIBRARY (TX0098)
PO BOX 47 HONEY GROVE, TX
Service Area Population: 1,656
Locale: Rural

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:		Staff Data:		Finance Data:		Collection Data:	
Hours:	1,760	MLS Librarians:	0	Revenue:	110,120	Printed Materials:	19,665
Visits:	33,814	Librarian Staff:	0.9	Staff Expenditures:	73,219	eBooks:	5,185
References:	1,246	Other Staff:	1.65	Collection Expenditures:	26,830	Audio Materials:	437
Users:	2,598	Total Staff:	2.55	Capital Expenditures:	0	Video Materials:	3,051
Circulation:	36,108					Databases:	65
Interlibrary Loans To:	96					Print Serials:	32
Programs:	447						
Computers:	23						

2. **Caledonia Public Library**, Caledonia, Minnesota, population served 6,319

CALEDONIA PUBLIC LIBRARY (MN0071)
231 E MAIN STREET CALEDONIA, MN
Service Area Population: 6,564
Locale: Town

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:		Staff Data:		Finance Data:		Collection Data:	
Hours:	2,089	MLS Librarians:	0	Revenue:	102,355	Printed Materials:	11,826
Visits:	19,000	Librarian Staff:	1	Staff Expenditures:	S	eBooks:	32,641
References:	540	Other Staff:	0	Collection Expenditures:	12,293	Audio Materials:	325
Users:	2,062	Total Staff:	1	Capital Expenditures:	8,519	Video Materials:	965
Circulation:	29,048					Databases:	56
Interlibrary Loans To:	3,408					Print Serials:	54
Programs:	129						
Computers:	8						

3. **Cornwall Public Library**, Cornwall, New York, population served 16,841

CORNWALL PUBLIC LIBRARY (NY0566)
395 HUDSON STREET CORNWALL, NY
Service Area Population: 16,841
Locale: Suburban

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:		Staff Data:		Finance Data:		Collection Data:	
Hours:	3,276	MLS Librarians:	3.14	Revenue:	1,207,987	Printed Materials:	61,164
Visits:	167,438	Librarian Staff:	5.95	Staff Expenditures:	765,497	eBooks:	10,870
References:	26,356	Other Staff:	6.92	Collection Expenditures:	115,816	Audio Materials:	5,412
Users:	9,739	Total Staff:	12.87	Capital Expenditures:	0	Video Materials:	7,501
Circulation:	172,503					Databases:	26
Interlibrary Loans To:	24,206					Print Serials:	131
Programs:	623						
Computers:	14						

4. **Glenns Ferry Public Library**, Glenns Ferry, Idaho, population served 1,100

No IMLS Public Library Statistics for this library.

5. **Greenwich Free Library**, Greenwich, New York, population served 4,942

GREENWICH FREE LIBRARY (NY0637)

148 MAIN STREET GREENWICH, NY
Service Area Population: 4,942
Locale: Town

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:		Staff Data:		Finance Data:		Collection Data:	
Hours:	2,375	MLS Librarians:	1.14	Revenue:	221,126	Printed Materials:	23,379
Visits:	57,100	Librarian Staff:	1.14	Staff Expenditures:	94,131	eBooks:	7,927
References:	3,350	Other Staff:	1.34	Collection Expenditures:	13,917	Audio Materials:	1,819
Users:	3,326	Total Staff:	2.48	Capital Expenditures:	7,496	Video Materials:	2,162
Circulation:	39,182					Databases:	13
Interlibrary Loans To:	6,213					Print Serials:	25
Programs:	439						
Computers:	8						

6. **Hot Springs Library, Hot Springs**, North Carolina, population served 560 (21,157 in county)
   No IMLS Public Library Statistics for this library.

7. **Ignacio Community Library**, Ignacio, Colorado, population served 5950 (town 750, district 5,200)

IGNACIO COMMUNITY LIBRARY DISTRICT (CO0141)

PO BOX 886 IGNACIO, CO
Service Area Population: 5,817
Locale: Rural

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:		Staff Data:		Finance Data:		Collection Data:	
Hours:	3,152	MLS Librarians:	2	Revenue:	796,229	Printed Materials:	28,692
Visits:	84,562	Librarian Staff:	2	Staff Expenditures:	329,727	eBooks:	17,604
References:	2,297	Other Staff:	6	Collection Expenditures:	55,119	Audio Materials:	1,008
Users:	6,503	Total Staff:	8	Capital Expenditures:	6,000	Video Materials:	2,370
Circulation:	30,003					Databases:	33
Interlibrary Loans To:	164					Print Serials:	73
Programs:	531						
Computers:	30						

8. **James Kennedy Public Library**, Dyersville, Iowa, population served 5,000

JAMES KENNEDY PUBLIC LIBRARY (IA0334)

320 1ST AVE E DYERSVILLE, IA
Service Area Population: 4,058
Locale: Town

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:		Staff Data:		Finance Data:		Collection Data:	
Hours:	3,134	MLS Librarians:	2.5	Revenue:	402,143	Printed Materials:	57,364
Visits:	81,791	Librarian Staff:	3.45	Staff Expenditures:	240,382	eBooks:	20,786
References:	3,926	Other Staff:	2.98	Collection Expenditures:	75,570	Audio Materials:	2,342
Users:	4,870	Total Staff:	6.43	Capital Expenditures:	0	Video Materials:	5,650
Circulation:	148,644					Databases:	27
Interlibrary Loans To:	403					Print Serials:	171
Programs:	639						
Computers:	13						

9. **Madison Public Library**, Madison, South Dakota, population served 12,622

MADISON PUBLIC LIBRARY (SD0018)

209 EAST CENTER MADISON, SD
Service Area Population: 7,258
Locale: Town

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:		Staff Data:		Finance Data:		Collection Data:	
Hours:	3,016	MLS Librarians:	1.85	Revenue:	528,175	Printed Materials:	53,890
Visits:	32,189	Librarian Staff:	2.7	Staff Expenditures:	269,972	eBooks:	13,715
References:	1,872	Other Staff:	2.13	Collection Expenditures:	130,363	Audio Materials:	5,735
Users:	5,182	Total Staff:	4.83	Capital Expenditures:	20,000	Video Materials:	3,461
Circulation:	65,911					Databases:	57
Interlibrary Loans To:	480					Print Serials:	150
Programs:	245						
Computers:	8						

10. **Norelius Community Library**, Denison, Iowa, population served 8,298

NORELIUS COMMUNITY LIBRARY (IA0481)

1403 1ST AVE S DENISON, IA
Service Area Population: 12,551
Locale: Town

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:		Staff Data:		Finance Data:		Collection Data:	
Hours:	3,120	MLS Librarians:	0	Revenue:	308,461	Printed Materials:	50,775
Visits:	93,578	Librarian Staff:	5.54	Staff Expenditures:	248,855	eBooks:	20,112
References:	5,883	Other Staff:	0.25	Collection Expenditures:	29,346	Audio Materials:	2,985
Users:	6,355	Total Staff:	5.79	Capital Expenditures:	0	Video Materials:	2,727
Circulation:	45,483					Databases:	18
Interlibrary Loans To:	495					Print Serials:	100
Programs:	293						
Computers:	21						

11. **Punxsutawney Memorial Library**, Punxsutawney, Pennsylvania, population served 15,760

PUNXSUTAWNEY MEMORIAL LIBRARY (PA0097)

301 EAST MAHONING STREET, SUITE 4 PUNXSUTAWNEY, PA
Service Area Population: 15,760
Locale: Town

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:		Staff Data:		Finance Data:		Collection Data:	
Hours:	2,443	MLS Librarians:	1	Revenue:	127,346	Printed Materials:	29,441
Visits:	71,053	Librarian Staff:	1	Staff Expenditures:	127,692	eBooks:	1,608
References:	4,700	Other Staff:	3.13	Collection Expenditures:	17,783	Audio Materials:	498
Users:	3,041	Total Staff:	4.13	Capital Expenditures:	95	Video Materials:	1,722
Circulation:	34,874					Databases:	25
Interlibrary Loans To:	141					Print Serials:	53
Programs:	292						
Computers:	13						

12. **Ronan Library District**, Ronan, Montana, population served 8,645

RONAN LIBRARY DISTRICT (MT0058)

203 MAIN STREET SW RONAN, MT
Service Area Population: 8,645
Locale: Rural

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:		Staff Data:		Finance Data:		Collection Data:	
Hours:	2,704	MLS Librarians:	0	Revenue:	1,941,328	Printed Materials:	19,800
Visits:	52,676	Librarian Staff:	4	Staff Expenditures:	176,797	eBooks:	18,874
References:	6,604	Other Staff:	0	Collection Expenditures:	19,514	Audio Materials:	837
Users:	5,118	Total Staff:	4	Capital Expenditures:	0	Video Materials:	1,365
Circulation:	36,013					Databases:	38
Interlibrary Loans To:	111					Print Serials:	9
Programs:	92						
Computers:	12						

13. **Town Creek Public Library**, Town Creek, Alabama, population served 1,080

TOWN CREEK PUBLIC LIBRARY (AL0253)

15971 MAIN STREET TOWN CREEK, AL
Service Area Population: 1,076
Locale: Rural

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:		Staff Data:		Finance Data:		Collection Data:	
Hours:	1,265	MLS Librarians:	0	Revenue:	36,759	Printed Materials:	9,327
Visits:	11,259	Librarian Staff:	1	Staff Expenditures:	S	eBooks:	0
References:	276	Other Staff:	0	Collection Expenditures:	7,152	Audio Materials:	65
Users:	1,731	Total Staff:	1	Capital Expenditures:	0	Video Materials:	846
Circulation:	8,406					Databases:	58
Interlibrary Loans To:	0					Print Serials:	0
Programs:	5						
Computers:	14						

14. **Tucker Free Library**, Henniker, New Hampshire, population served 4,900

TUCKER FREE LIBRARY (NH0003)

P.O. BOX 688 HENNIKER, NH
Service Area Population: 4,875
Locale: Rural

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:	
Hours:	2,652
Visits:	30,000
References:	6,792
Users:	3,869
Circulation:	34,481
Interlibrary Loans To:	1,027
Programs:	64
Computers:	19

Staff Data:	
MLS Librarians:	1
Librarian Staff:	1
Other Staff:	2.5
Total Staff:	3.5

Finance Data:	
Revenue:	250,583
Staff Expenditures:	179,228
Collection Expenditures:	24,781
Capital Expenditures:	0

Collection Data:	
Printed Materials:	16,718
eBooks:	19,462
Audio Materials:	442
Video Materials:	1,206
Databases:	23
Print Serials:	24

15. **Wilton Public and Gregg Free Library**, Wilton, New Hampshire, population served 3,400

WILTON PUBLIC & GREGG FREE LIBRARY (NH0144)

P. O. BOX 420 WILTON, NH
Service Area Population: 3,678
Locale: Suburban

Central Libraries: 1
Branch Libraries: 0
Bookmobiles: 0

Service Data:	
Hours:	1,872
Visits:	12,900
References:	10,439
Users:	3,775
Circulation:	27,889
Interlibrary Loans To:	866
Programs:	496
Computers:	11

Staff Data:	
MLS Librarians:	2
Librarian Staff:	2
Other Staff:	1.95
Total Staff:	3.95

Finance Data:	
Revenue:	333,094
Staff Expenditures:	204,377
Collection Expenditures:	23,718
Capital Expenditures:	0

Collection Data:	
Printed Materials:	19,718
eBooks:	19,462
Audio Materials:	778
Video Materials:	1,740
Databases:	25
Print Serials:	48

Are incentives ethical?

Dr Frankie Wilson

Bodleian Libraries, University of Oxford

Abstract

Incentives such as vouchers, desirable technology, or even free printing are now well established as a way to motivate people who might otherwise not participate in a survey. This is not just in libraries, but whenever surveys are used (e.g. Singer,2002). However, one of the questions I am most frequently asked by library colleagues when I am talking about surveys is whether it is ethical to offer incentives. My position is that it is unethical <u>not</u> to offer incentives.

An individual's decision to participate in a survey is influenced by multiple factors, which fall into three broad categories: altruism (it is the 'right'thing to do; person feels morally or socially obliged), survey-specific reasons (topic is of interest; identity of the person sponsoring the survey), and 'egoistic' (Singer & Couper, 2008) reasons (incentive; opportunity to convey a specific point of view). All these factors could exert push or pull effects on an individual's decision to respond to a survey, resulting in a complex set of interactions influencing a person's cooperation (Groves, Singer and Corning,2000).

Research has shown that incentives are particularly useful where there are no other motives to participate (Shettle & Mooney, 1999). Therefore, it can be concluded that people take part in surveys when they have some driver to do so. This driver may be intrinsic to them: a moral obligation; interest in the topic; a desire to convey a point of view. In the absence of a strong enough intrinsic driver, an incentive acts as a extrinsic driver and makes it significantly more likely that someone will take part in a survey (Baumgartner and Rathbun, 1997).

If a survey has no incentives, then only those with intrinsic drivers will take part. This would mean that decision would be made, including on key aspects of library provision, based on data that data that does not accurately reflect the opinions of all our readers. Knowingly undertaking a survey which will gather responses only from a subset of the population is unethical.

Furthermore, if the purpose of incentives is to act as an extrinsic incentive to those who would otherwise not be (intrinsically) motivated to provide feedback, then the specific incentives offered must appeal to the target group.

In conclusion, the only ethical option for our community is to offer incentives for our feedback gathering exercises.

Submitted to Open Access journal, so not included in Conference Proceedings

B(u)y the Book

Evaluation of a University initiative to provide students with fund to buy books

Fran Porritt

Teesside University

Abstract

In the era of high student fees and intense market competition, many universities now buy books for their new students. Some universities have provided textbooks, or e-resources pre-loaded on devices. In a new innovation, many universities are now incorporating student choice into the offer and have enabled students to choose how to spend funds via the use of a smartcard or similar mechanism pre-loaded with funds.

Teesside University have successfully piloted such an approach with one academic School, the School of Social Sciences, Humanities and Law. The pilot has now been extended to all academic Schools, with all students receiving £100 per academic year to spend on reading list books. The scheme covers new full-time undergraduate students at the University, and is operated in collaboration with an external company, JS.

The NSS qualitative data often reveals a perceived shortfall in the ability of libraries to be able to meet student demand: "There can sometimes be a shortage of specific books I need for my course" (NSS comment, 2017).The scheme aims to address this issue. The aim of the project to evaluate the Teesside University Advance scheme against baseline data of book borrowing and reservation patterns of reading list titles. The project will explore the impact upon the student experience and student perceptions of the Library.

There are two strands to the project: qualitative and quantitative. The quantitative strand analysed quantitative data from library systems and from data provided by JS. Excel data analysis of data pertaining to book borrowing and reservation patterns; and book purchasing patterns via the Teesside University Advance scheme. We also surveyed students about the scheme in order to obtain views from as many students as possible from the eligible population of new undergraduate students. The qualitative strand used interviews to gain an insight into why students select certain titles to purchase; and what their expectations of the university library are for the supply of reading list titles. Analysis of the interviews will be done using Grounded Theory. The research team will meet to discuss and agree themes that have emerged so that there is a consistency of approach.

Findings show that less of the shrinking book fund can be allocated for the core titles identified in the book bundles, to allow for expansion of the breadth of the University Library's collection. The interviewee data demonstrated some of the trends in an individual student's selection of sources and how fundamental guidance on sources is, for new recruits to University. It also allowed an insight into some of the areas which may need further scaffolding interventions and resources in place, for example help with academic reading.

This paper has been submitted to the Conference Special Issue of Performance Measurement & Metrics

But what about us? Developing an inclusive approach to library insight.

Selena Killick

The Open University

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Abstract

The Open University (OU) is the UK's largest academic institution dedicated to distance learning, with over 120,000 students. The Library, based in Milton Keynes, was established alongside the University in 1969 to provide academic staff with access to the latest research in their field. The print library was designed to meet the needs of campus-based staff. The design of the teaching materials posted to students meant that they did not require access to an academic library service. At the turn of the millennium, as electronic publishing and home internet access grew, we commenced offering services to students and sought to establish a library that met their needs.

We have a strong culture in performance measurement and assessment, which helps to ensure that strategy and service improvement is underpinned by evidence. Since 2012, this effort has been helped significantly by our Student Library Research Panel, a dedicated community of students who work with us in partnership as co-creators (Dick and Killick, 2016). A rolling recruitment effort attracts 500 students annually who agree to work with us for a year to contribute to our programme of continual improvement. Although there is a natural self-selection bias to panel membership, many students who join have had limited or no experience of the library when they agree to become part of the community due to the nature of distant learning. This inclusive approach to our student insight research ensures that our service development takes into consideration both user and nonuser needs.

As our assessment culture has grown, one concern about our approach has continued to surface: the panel membership has been restricted to distance learning undergraduate and taught postgraduate students, but these are not the only user groups that the library serves. When we developed the panel in 2012, a key objective was to ensure that we captured the views and experiences of these members of our community. They are the largest community we serve, and by their very nature difficult to gain feedback from. While some user experience research was conducted with the predominantly campus-based research students, insight from academic staff was provided only through anecdotal feedback. Feedback from our 9,000 associate lecturers, who teach our students directly and who are predominantly employed on a part-time distance basis, was even scarcer. We were concerned that we were planning service improvements based on student needs alone and not seeing a fuller picture.

In February 2018 we started a Library Needs project, seeking to gain a more detailed understanding of current and future needs and expectations of the Library service from the whole OU community by undertaking focussed qualitative research with:

- Academic staff based on campus and in other parts of the UK

- Associate lecturers

- Research students on campus and in other parts of the UK

- Students (undergraduate and taught postgraduate)

A total of 33 interviews were conducted as part of the project, using a directed storytelling approach to gain rich insights into the needs of our community. The conversations were recorded and transcribed before conducting Conversation Analysis (CA) and Thematic Analysis (TA) to draw out the themes in our very rich data. The findings were used by the library's

extended leadership team, coupled with their professional expertise, to develop the departmental operational plan and objectives for the forthcoming academic year.

While the insights gained from the students (and, to some extent, from the research students) corresponded with the research previously undertaken with the student panel, some wider insights from the other community groups surprised us. Positively, we are seen as a prized resource that is central to the work of the University. Participants spoke about the value of the Library in their work, research, and study. In line with our continual improvement culture, however, one area was singled out as in need of improvement: the physical library. Since commencing offering services for student the Library placed a strong focus on electronic resources and we moved increasingly towards a virtual presence. Understandably, this suits our largest community, the distant learning students, but in the process the Library lost some relationship capital with campus-based academic staff and research students.

In response to these findings, the Library has partnered with the Estates department to develop a new vision and strategy for the physical library. In line with our assessment culture this has been based on insight. Through observation studies, love letters and break up letters, and guerrilla interviews with both users and nonusers of the building we have identified the needs and expectations of the physical library. This insight, combined with our professional expertise has resulted in the new vision and strategy which we are now working to deliver.

The wider learning from this process, however, is the importance of capturing the views of our whole community, including the users and nonusers, from all user groups. To take this forward we are in the process of extending and enhancing the Library Student Research Panel which has served us so well, to become the Library Research Panel, to ensure we continue to gather insight from our whole community.

References

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Submitted to Open Access journal, so not included in Conference Proceedings.

Change that counts: designing and measuring impact at the National Library of Wales

Dr Dafydd Tudur

Llyfrgell Genedlaethol Cymru - The National Library of Wales

'$\psi \gamma$ xhσ Iatpeion' is considered the oldest library motto in the world. According to the Greek historian Diodorus Siculus, there were the words above the entrance of the chamber in which King Ramesses II of Egypt stored his books; it's been described as the 'earliest authenticated library' (Lutz, 1978). Translated into English, it means 'the house of healing for the soul'. From the earliest days, it seems, the library was seen as more than a facility for storing and accessing books, and indeed more than a repository of knowledge or information - it was an agent of change.

Over three thousand years later, the Welsh rock band Manic Street Preachers were also testifying to the influence of libraries. 'Libraries gave us power' were the opening lyrics to one of my favourite songs as a teenager: the anthemic 'A Design for Life'. Apparently, these words also were also inspired by the motto of a local library. As for many, books and libraries played a large part in my childhood and teenage years; the Manics' claim for me went unquestioned. But could this wider societal impact of libraries - the empowerment of their users, the improvement in wellbeing - be proven? Very often, we measure performance based on outputs rather than outcomes, and more specifically the change in and for our users and readers.

How do we measure and demonstrate this influence that we as libraries have on our stakeholders and for society in general? In my role at The National Library of Wales, it was the discussion around open access that brought these questions into focus. In the debate regarding the claim of ownership of copyright in digital copies of public domain works, arguments in favour of commercializing those copies often seemed more compelling because they were based on hard figures. The wider impact of removing barriers and facilitating unhindered access, on the other hand, seemed to be based on reasoning, hypotheses and case studies. Now, in the face of threats to funding and broader questions about the role of libraries, the need is greater than

ever to provide compelling evidence of the value of libraries to society by measuring and demonstrating the difference we make.

The National Library of Wales contributed to the peer review engagement for Simon Tanner's work on 'Measuring the Impact of Digital Resources: The Balanced Value Impact Model' in 2012 (Tanner, 2012), but it was not until recently that we began to explore in earnest this question of how best to measure our wider 'impact'. This was set in motion largely by the publication of the Europeana's Impact Playbook, a resource that is founded on the principles laid out in the Balanced Value Impact Model. The first of the Playbook's four phases - design, assess, narrate, and evaluate - was published online in November 2017 (Europeana Impact Playbook, 2017).

A 'playbook' is, by definition, a stock of strategies, tactics or methods, and Europeana's Impact Playbook aims to provide for cultural heritage institutions who wish to design, assess and narrate their impact - especially in the digital domain. One of the Playbook's primary aims is to establish a common language for discussing the impact of cultural heritage, and it begins by providing a definition of 'impact' as 'changes that occur for stakeholders or in society as a result of activities (for which the organization is accountable)'.

Followed from start to finish, the Playbook guides the practitioner through a series of activities and exercises in the form of sessions and workshops. These begin with identifying and understanding stakeholders (suggesting the use of empathy maps), establishing strategic perspectives and viewing the proposed activity through value lenses. The backbone of the methodology is the 'Change Pathway', a tool for identifying stakeholders, resources, activities and outputs, and mapping impact from the activity and its outputs, to its outcomes and, ultimately, the intended impact. This provides the basis for measurement.

We put the Playbook through its paces at the National Library of Wales shortly after its publication. Adopting a flexible approach to its implementation, the process was compressed into a single session and applied to a single community transcription event which used the Library's new crowdsourcing platform.

This first exercise didn't progress to data collection, but it did place the focus on the participant. It also established a shared understanding of our aims in delivering the activity, and of how those translated into action (Tudur, 2017).

Our next use of the resource was the Wicipobl ('Wiki-people') project, which sought to enhance and demonstrate the impact of uploading over 4,800 works from the Welsh Portrait Archive to Wikicommons. Using the Playbook, three key target participant groups were identified for the project - education, community and creative industries - and we sought to understand how they could benefit from open access to the collection, and especially on Wikimedia platforms (Evans, 2019).

NLW was funded by the Welsh Language Unit of Welsh Government to deliver activities that would contribute towards the delivery of its Welsh Language Strategy. Using the change pathway, the impacts for Welsh Government were aligned with the activities we had proposed to address the pains and gains of the four stakeholder groups. In doing so, we could see how the same approach could be apply to design activities that deliver impact in areas that aligning with other Government strategies, the aims of funding bodies, compliance with Wales's Well-being of Future Generations Act 2015 or the UN's Sustainable Development Goals.

The project's measurement methods ranged from Wikimedia metrics to feedback from event participants. Creating the change pathways for each stakeholder group helped with the design of activities that met their specific needs, and an approach to measurement that focussed on collecting data that would show the degree to which we had been successful in achieving the desired impact for each group.

The intended impact for creative industries was to increase cooperation with the Library and its data for the benefit of the people of Wales and those studying Welsh history. A History Hackathon was organised for this stakeholder group, which produced several applications based on historical data from the Library's collections. All of the participants were interested in attending similar events in the future, and they all stated that the event had given them ideas for projects. 28% could see potential for commercial projects using the open data and images. These statistics are basic, but they tell a story that would not have emerged from measuring outputs alone. Though we still have a great deal to learn when it comes to measurement, the key difference was that we had intentionally looked beyond the outputs of the activity, and at evidence of how we had influenced change in the key stakeholder groups.

Our desired impact in education was for the data to be used in teaching the history of Wales and its people, whilst also contributing to improvements in Welsh education.

To achieve this, we worked with Menter Iaith Mon, the Welsh Language initiative on the isle of Anglesey, to deliver Wikipedia edit-a-thons in four schools. Between them, they created 50 new Welsh Wikipedia articles - this was an output for the project. As for the outcomes, all of the pupils said that they would like to use Wikipedia in the classroom again and 90% said that, following the events, they felt confident enough to continue to contribute to Wikipedia on their own. Pupils also shared the pride and satisfaction that they felt when contributing to Wikipedia. 46% of the participants went on to edit Wikipedia again within four weeks, which showed a significant retention of editors.

The feedback from teachers was also positive - all claimed that the sessions gave them confidence to use Wikipedia as a teaching tool, and saw its potential as a tool for achieving the targets in Welsh Government's Digital Competency Framework and for teaching skills such as editing, presenting information, literacy and bilingualism. Data collected about the pupils' methods of accessing information online also led to the development of a further funding application to focus efforts on improving the provision of Welsh language open content relating to the school curriculum.

Although many of the things that we had done in this project wouldn't be considered particularly novel, impact design and assessment embedded ways of thinking that gave focus and efficiency to our activities, and resulted in the collection of data that enabled us to articulate our impact in a way that m

One of the strengths of the Impact Playbook is its versatility. It could be used to consider how best to approach a specific source of funding, with a proposed project or activity, a target group of participants, or with a blank canvas. It engages a team that will be delivering an activity and project in the wider discussion on *why* they are undertaking the activity, from the strategic perspective of their organisation to the value it seeks to create for stakeholders.

Looking forward, we aim to build on our initial experiences of impact design and measurement by gradually incorporating impact design and assessment into our planning and evaluation. We've begun to apply the Playbook's methodology to the community engagement activities of Welsh Government's People's Collection Wales programme and impact design and assessment is being incorporated into our crowdsourcing project planning.

We have found in the course of our activities so far that while we have gained a much better understanding of *what* we wish to measure, we still have much to learn about data collection methods and management. Improving these skills and methods is a key area of development and the 'Assess' phase of the Playbook, which will provide users with examples of best practice for data collection and analysis, is eagerly awaited.

Also, through our work here within Wales - by sharing our activity in this area within the libraries and archives sectors - and through the work of the Europeana Impact Community, we would like to see the development of a community of impact practitioners - a network of professionals who are working in cultural heritage who are designing, managing and measuring their impact. Working within the resources available to us, creating a culture of impact awareness will rely on our success in giving staff the space and opportunity to develop their skills and understanding in this area. In doing so, there is also much to gain from sharing and learning from each other's experiences and from our insights into how our activities effect change in and for stakeholders, and the difference that we continue to make in society.

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Collaborative Assessment: Gathering, normalizing, visualizing, and sharing multiple data sets to support collaborative collection development and resource sharing

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Context

The Ivy Plus Libraries Confederation (IPLC) is a partnership of thirteen of the most prestigious research institutions in the United States. It includes, Brown, Cornell, Columbia, Dartmouth, Duke, Harvard, Johns Hopkins, MIT, Princeton, University of Chicago, University of Pennsylvania, Stanford, and Yale. The group's collective collection comprises more than 90 million bibliographic records. These 13 libraries share print materials via the BorrowDirect Consortial Resource Sharing Service, a system exclusive to the IPLC, that uses the OCLC Relais D2D software and fills more than 285,000 requests each year.

Since the OCLC Relais D2D system does not include an analytics component, the University of Pennsylvania developed and maintains, on behalf of the IPLC, an infrastructure based at UPenn and known as MetriDoc, to support analytics and a large corpora of business intelligence made up of millions of transactional and bibliographic records of the thirteen partners. The resulting MetriDoc application is call the Resource Sharing Assessment Tool (RSAT). It contains, in addition to the vast transactional base derived from Relais D2D, the combined data output from the Illiad interlibrary loan platforms of the partners. The merging of these sources into MetrDoc, provides a comprehensive view of resource sharing within the IPLC.

Problem Statement

I. Strategic need for data and analysis tools to inform decisions, enhance services, anticipate and adapt to change, demonstrate value.

The vast preponderance of patron-library interactions that has use-value associated with it now leaves a trace of some kind in a database or computer application. Simply scan the possible types and modalities of library service and you find very little occurring without the intermediation of a machine. Even in-person exchanges between librarian and user are recorded in online settings – often when librarians assess or report on their professional activity, and with increasing frequency, when the librarian-user exchange and its analytic byproducts involve applications like Springshare's Libanswers, Libinsight, and LibCRM.

The breadth of data collection raises important issues of privacy which require ever more openness and vigilance on the part of libraries. How libraries balance user privacy with the potential benefits posed by data analytics is a significant challenge. But the data available for the enrichment of service and enhancement of organizational process and culture are too substantial to ignore. Likewise, the pressure on libraries to produce high quality, strategically-managed, cost-efficient and relevant services is a powerful inducement to leveraging today's vast data stores.

While this paper does not directly address the pressing matter of privacy, it does highlight the effects of privacy on the development and use of analytical tools.

II. No analytics system resident in the applications, plus a vast array of BI targets in the enterprise.

In information's analog age, libraries were fairly simple, linear organizations designed to acquire materials, organize and stack the inventory, then help users identify and access the available stuff. The digital age has spawn a far more complex

reality, one intricately woven with technologies. On even a cursory scan, it wouldn't be surprising to find the following products and services offered by a typical university library today:

- Acquire and license information in a host of formats
- Provide access to massive amounts of e-content
- Enable discovery of local and remote collections
- Create and manage supply chains [local circulation & third party - ILL]
- Preserve and curate collections, from parchment to digital bits
- Support information and digital literacy through training and consultation
- Support digital scholarship [data wrangling, software consulting, digital storage, IT selection, statistics, etc]
- Operate and help govern courseware services
- Create "Studios of the Mind": digital commons and other facilities for learning/study/creation
- Assist authors in publishing
- Develop structures to clear copyright and to open access
- Provide technology services (e.g., desktops/laptops, Ed. Tech, software provisioning)
- Provide digital conversion services, Scan-on-Demand, 3D printing and imaging,
- Create and help build Knowledge Bases (e.g., OCLC) world wide
- Provide analytical services to college administration
- Build repositories (internal and public-facing digital archives)
- Support research compliance & dissemination (e.g., RIM services, ORCID, DMPTool)
- Design and deploy software
- Drive enterprise applications (e.g., OPACs, EZProxy, VIVO)
- Forge collaborative programs with Peers and Vendors
- Explore the boundaries of new technology (e.g. VR & AR) for/with students & faculty.

Behind this menu, one will find a plethora of applications and extensive technical infrastructure whose primary purpose is service delivery and continuity, not analytics. Until fairly recently, statistical reporting was an afterthought for library application developers--a task performed with surplus resources like logs which lacked useful structures for business intelligence and no means for synthesizing measures or assessment activities across systems. Today, all library business applications tout reporting capabilities, but each reporting module is a closed data silo, abstracted from every other silo by proprietary data models and structures, and the confinements of the applications beneath the reporting databases. For those familiar with Alma Analytics, the siloing problem should be familiar.

In an edition of *Educause Review*, Rich Clayton, Vice President of Analytics and Product Management for Oracle, cites data siloing as a key obstacle to realizing the potential of business intelligence in academic settings. In addition to siloing, Clayton also speaks of the limited scope and work-relevance of analytical tools, and calls out the difficulty of using business intelligence technology across an institution—or institutions. And he concludes by saying, "most administrative leaders spend 90 percent of their time collecting facts about what happened and 10 percent understanding the causes." (The rear-view dynamic of measurement and assessment.) "Important variables often go undiscovered," Clayton goes on to say, "because most analysts keep analyzing the same data when what's needed is a capability to find patterns automatically and bring those insights to the decision at hand."[i]

This is good counsel for libraries interested in leveraging the troves of data at their fingertips. In order to produce rich and impactful analyses, libraries must first develop the means of aggregating data across an extraordinarily broad and diverse spectrum of data environments. The IPLC confronted a small-scale version of this problem every time resource sharing

managers had to assess the volume and velocity of service across the consortium and its interlending platforms. After aggregation, libraries face the problem of normalizing inputs and creating a functional synthesis of what's aggregated.

In the end, the community must address these challenges in the absence of affordable, ready-to-implement solutions. There are no shrink-wrapped products or frameworks that can perform the necessary data wrangling, complete complex data transformations, structure and store the results, and, finally, support analytical workflows necessary to building datasets and visualizations. This level of business intelligence demands a degree of support and technical ingenuity that libraries have typically reserved for critical functions like the ILS, discovery systems, and repository services. The required IT development in this case is beyond any one institution to drive and must be advanced either by commercial enterprises or through community effort.

Software development and infrastructure services will find willing commercial interests and some from the library space may even come forward to develop solutions that advance beyond reporting modules. But libraries need to think carefully about the curation of their business data assets, laden as they are with privacy concerns and with enormous intellectual AND commercial value for the few and highly consolidated number of firms now offering services in this space. In the end, the solution, like the challenge, belongs arguably to the community, working within thoughtfully governed collaborations that involve commercial developers, but with the library's legal and operation control of the data.

Metridoc: An ETL Framework for Library Settings

MetriDoc is a data harvest framework and workflow engine that attempts to meet several of the challenges outlined above. It is a set of workflow and data processing tools devised by the Penn Libraries, with assistance from the Institute for Museum and Library Services and the IvyPlus Libraries Confederation.

MetriDoc's primary features include:

- A central repository of activity data (not a reporting tool, ala Alma Analytics),

- The capability of ingesting a wide variety of data sources,

- Support for demographic cross-references,

- Potential to describe users and uses of library services in high resolution across a range of service vectors,

- Protections for PII, and

- An open source code base.

The components of MetriDoc are orchestrated to replicate basic data warehouse functions:

- Extracting activity data from systems and spreadsheets

- Transforming data into readable, normalized formats

- Loading transformed/normalized payload into a central data repository

- Supporting analysis through open integration with off-the-shelf analytical tools such as Excel and Tableau.

Penn has employed a common set of development tools in the MetriDoc build, including Ruby on Rails, YAML for data source configurations, Postgres database for speed and scale, Active Admin (the administrative framework for Ruby on Rails) supporting a basic UI with features for filtered search, and download capability.
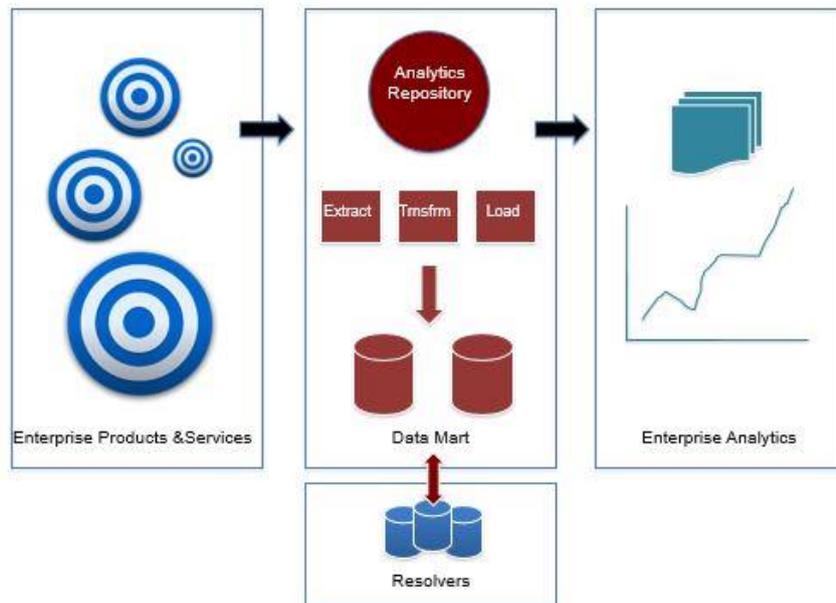
Figure 1. MetriDoc Workflow

Analytics Workflow

MetriDoc provides several means for exploring and publishing data. Ruby gems and scripts can be run against the data store to create graphical and tabular dashboards. The system's UI features allow analysts to browse conveniently the contents of tables, to filter on specific data elements, and to download parameterized datasets. Since MetriDoc can interoperate with statistical packages via API or ODBC drivers, the system offers a full stack of technologies for assessment and measurement. When the internal MetriDoc user interfaces and download features are coupled with Tableau or similar visualization software, the system supports a wide range of efficient workflows. In very short order, Tableau can be used to generate progressively finer cross tabulations and recombination of data elements, reading directly from MetriDoc's data store. This enables the analyst to sort quickly through millions of inputs that are relevant to her research hypotheses or statistical questions. The goal is to use the power of data visualization to reduce noise or amplify resolution which leads to the construction of datasets that in turn fuel even deeper exploration. While glamorous statistical displays are useful and informative, they are a distant end point of this process. Along the way to compelling displays, visualizations can aid triage, heighten the efficiency of research, and enhance the recognition of interesting patterns. Once parameters are set, the analyst can return to the MetriDoc UI to download a relevant set of data with event-level data elements including time/date stamp, geo-location, demographic variables, bibliographic information, organizational data, in short a full set of dimensions limited only by the event description and ETL processes used to populate the data store.

Data Governance and Other Challenges

This paper explores efforts to create a technical infrastructure for organizational analysis and assessment. The topic is viewed through the lens of a specific collaborative assessment project, the IPLC's Resource Sharing Assessment Tool. The challenge of developing the infrastructure is best met with a degree of programming and computer center support comparable to key forms of library IT, for example the ILS. But, the inter-institutional requirements of an initiative like RSAT comprise a different and in many ways more complex set of challenges than setting up servers and writing code. The plumbing is, in a sense, easily realized; the data governance and cultural affordances that undergird this sort of collaboration are less so.

Among the institutional challenges of RSAT, the following were especially demanding of project planners' time and effort:

1. *Data normalization:* The systems that supply key information to MetriDoc have wildly divergence data structures and elements. Call numbers come in amazing variety within the standard structure of MARC. Data descriptive of users and institutional entities come in even greater variety, complicating the creation of normalize categories that support descriptive statistics and efforts at data reduction for privacy purposes.

2. *Standardization of data elements. Data governance:* Project managers of the IPLC are at this writing negotiating a standard ontology for data elements that will support a sustainable process of data governance. The standards we erect today must adapt to the service platforms of the future. This raises the priority of data governance in the creation of the next-generation resource sharing systems like Illiad and Relais D2D. The RSAT project has "bolted" assessment data flows onto systems designed in the first place for fulfillment. But the opportunity to realize a tighter coupling between assessment and other business processes is at hand, and libraries should begin formalizing their requirements for OCLC, ExLibris and other vendors in this space.

3. *Data potency vs. user privacy:* There will be a continuing tension between exercising the potency of personal data available in our transaction streams and following ethical norms in the use and safeguarding of that data. The IPLC has implemented a memorandum of understanding that lays out the conditions for transforming and storing personally identifiable information. This must be followed by institutional policies that regulate the research uses of MetriDoc's repository.

4. *Access controls, data transport, retention, and other operational policies:* RSAT has required the development of user access and data transport controls for system security. Resource management also requires a data retention policy and policies that regulate IT development, and the terms of system integrations. In the run up to the RSAT's full production release in September 2019, the IPLC is in the process of drafting these policies.

5. *Software resilience:* MetriDoc has passed through two generations of technical architecture since its inception with support from the Institute for Museum and Library Services. The present software stack was chosen for openness, its ubiquity within the library IT circles, and because of a supportive development community. The issue of resilience, especially as MetriDoc's data sources multiply and morph will continue to require vigilance and a forward-focused development plan.

6. *Vendor involvement:* It behooves libraries to retain full control over their activity data for the purposes of security and privacy. As these data are powerful sources of business intelligence, libraries have additional reason to regard them as critical assets and control their access and use. These priorities, however, do not preclude the involvement of vendors, either in partnering with libraries to incorporate assessment strategies into business applications, or to collaborate in data governance, or even provide after-market support for collaborative ETL frameworks like the one discussed in this paper.

The presence of open source options like MetriDoc creates opportunities for libraries to function as independent IT developers or as IT consumers working through structured agreements with vendors. The more options, the better. If we collaborate with firms, our goal should be rich assessment products which evolve beyond the isolated reporting module into a services based architecture that accumulates, transforms, links, and exposes a wide range of event data to cost-efficient analysis and decision-support.

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i Educause Review, July 1, 2019
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Collection Engagement Analytics: Changing the Liaison Landscape

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Introduction

Through this lightning paper, we share how the Information Services (IS) department has developed and used School Information Sheets over four years to understand how the 19,500 members of the University of Kent members use the 850,000 books, 310,000 e-books and 155,000 journals as well as the 50+ services we list our library teams as providing in our service catalogue. We explore our engagement aims, our design and evolution of the School Information Sheet, how we use it, what it has helped us achieve, and our priorities and approach to developing it.

We do not claim either to have invented the School Information Sheet, or to have a unique approach to liaison with academic colleagues. Many other universities are actively pursuing similar analytics but we feel that we have been particularly successful in combining these tools and techniques to support collection engagement in a greatly devolved multi-disciplinary institution. We hope that by sharing our experience others will be able to build on our work, as we have built on that of others.

What we wanted to achieve

The University has 20+ academic Schools. Although grouped into three Faculties, each School has a high degree of autonomy over how it delivers the University's ambitions and actions. As IS, the University's highly converged IT and library service, we work closely with academic colleagues to agree School-specific approaches to the provision of library resources and services. This includes negotiating with each School both how we will manage the areas of existing collections that are relevant to it and an appropriate budget to develop those collections.

In 2014/15, we identified a need to take an evidence-based approach and provide consistent, reliable collection engagement analytics that demonstrated why and where we needed to intervene. We wanted to be able to return to those metrics to show the positive impact of our interventions. Our academics shared our vision to develop the collection to support the wide-ranging needs of the communities we serve. Our ambition was to use this data as a benchmark and springboard to realise that shared vision. We felt that it could provide a tool for us to ensure that those collections remained relevant, impactful and regularly reviewed.

Whilst we had broad agreement about the vision, we wanted to foster stronger dialogue between IS and Schools around the creation, development and maintenance of the collections. We saw the value of a partnership approach where academic colleagues were able to articulate their ambitions and expectations and Liaison Librarians were able to advise how, working together, we could realise them. To achieve this, we aimed to create a shared understanding of the mutual co-ordinating responsibilities of the School Library Representative and Liaison Librarian. We were also seeking to ensure that senior colleagues supported both the School Library Representatives and the Liaison Librarians to completely own and fulfil their roles.
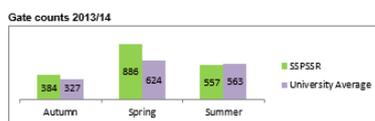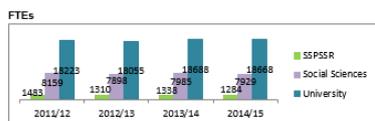
Historically our approach to collection management had been piecemeal, with reviews usually precipitated by changes to programmes or space challenges. We wanted to transition to a more dynamic and interactive way of working. We saw that as characterised by an ongoing dialogue at all levels, with the Liaison Librarian testing intelligence gathered through attendance at School committees with the School Library Representative, their managers exploring Faculty-wide initiatives, and an annual conversation with each Head of School ahead of the University's budget planning exercise.

We were concerned that our shared processes centred on collection development. Our introduction of the reading list system encouraged academic colleagues to focus on sharing details of new resources they wanted us to purchase rather than on teaching from the current collections. Only by engaging them around the richness of those resources, did we feel we would be able to support the full utilisation of the existing collections and to maximise their impact on academic outcomes.

As our physical collections reached maturity following the University's 50th anniversary in 2015, and mindful of our significant investment in digital collections from 2012 onwards, we wanted to embed collaborative decision making throughout the collection lifecycle. We hoped to involve academic colleagues in every aspect of collection management from selection to disposal. We recognised the need for structured and visualised data to inform those joint decisions around to maximising the availability, accessibility and sustainability of those collections.

Our final aspiration was to broaden our partnership to include stakeholders that supply, make discoverable and provide access to content. We saw a role for the Liaison Librarians to broker relationships between academic colleagues and aggregators, publishers and other specialist suppliers. We wanted to leverage the expertise of those groups in identifying solutions to education and research information needs but to bring our profession skills to bear in negotiations. We sought to establish metrics that could create a shared understanding of value for money as a basis for dialogue.
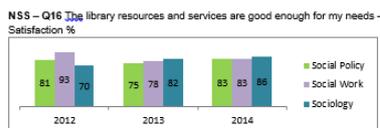
What we did

Figure 1.

In 2015/16, we created our first School Information Sheet (Figure 1), bringing together around 12 indicators and measures that show how members of that School have engaged with key library resources and services. We drew its content from existing data, routinely collected and easily available from our own, University and national sources. Following initial feedback from academic colleagues, we increasingly benchmark each School's data against the average for the Faculty. An ongoing challenge is for us to benchmark across our peer group institutions by discipline, although more subject-level metrics may become available because of the breakdown the Teaching Excellence Framework now requires.

The School Information Sheet includes measures of overall satisfaction with library resources as captured by the National Student Survey (NSS), Post-Graduate Research Experience Survey (PRES) and Post-Graduate Taught Survey (PTES). We share average satisfaction levels with library resources measured through the University's online module evaluation. Having brought this information together, we complement it with data from our own more nuanced survey. This explores satisfaction with the:

- Availability of books;

- Range of books;

- Service we give in our libraries;

- E-book provision;

- E-journal provision;

- Online reading lists;

- LibrarySearch (our discovery layer enabling students to find and access library resources).

As well as providing this more granular analysis, the IS Student Survey helps us to forecast the likely outcome of the next round of external surveys.

The School Information Sheet also highlights students' uptake of support and training delivered by IS Academic Liaison Services. As the delivery model is different for each School, the exact metrics vary between School Information Sheets. We seek to share both the number of students and the number of contact hours we provide through delivering taught sessions and one-to-one coaching. We break this data down by stage, mindful that undergraduates are more likely to attend a taught or formal induction session, while we offer support to post-graduate taught and post-graduate research students in smaller seminars.

We use circulation figures and library gate counts in the School Information Sheet as indicators of engagement with our physical collections and environments. These can provide an interesting contrast with Schools arranged on a spectrum from a high number of visits coupled with high borrowing rates, through a high number of visits couple with low borrowing rates, to a low number of visits with low borrowing rates. There is a significant variation between Schools even within a single faculty.

The School Information Sheets evidence shared decision-making through reading list data. The number of reading lists gives each School a measure that it can use to demonstrate engagement with the reading list system and how well it is supports access to learning resources. The number of reviews indicates the currency of those lists. We also show our investment on resources identified on reading lists on the School's behalf. This helps the School Library Representative and Liaison Librarian assess how dynamic the collection is. It also give them a planning tool helping them anticipate when the School will need to invest further in the collections.

The final metrics in the School Information Sheet explore collection development as measured by the School's annual budget and outturn for library resources. We break this down by Campus if the School has a presence and a different education/ research emphasis in different locations. We are also able to break it down to detail expenditure on books, datasets, inter-library loans and journals where the School finds this useful. We do not currently categorise expenditure into electronic and physical, although this is something we could explore.

Figure 2

The School Information Sheet presents data as charts and graphs or in tables (Figure 2). Wherever possible we provide data for the last three years to enable the School to identify and understand patterns and trends. We have significantly reduced the volume of text as we have continued to develop the School Information Sheet. We now largely limit it to commentary summarising feedback we have gathered through surveys, explanatory notes and headings.

What the results were

The School Information Sheet has been hugely successful in its main purpose of creating a basis for dialogue around library collections and services. Academic colleagues have welcomed it as a demonstration of our value and impact. We now receive regular requests for other metrics to support Schools' activity and University priorities. We have also used the School Information Sheet to address the organisational culture and promote change by evidencing drivers for engagement.
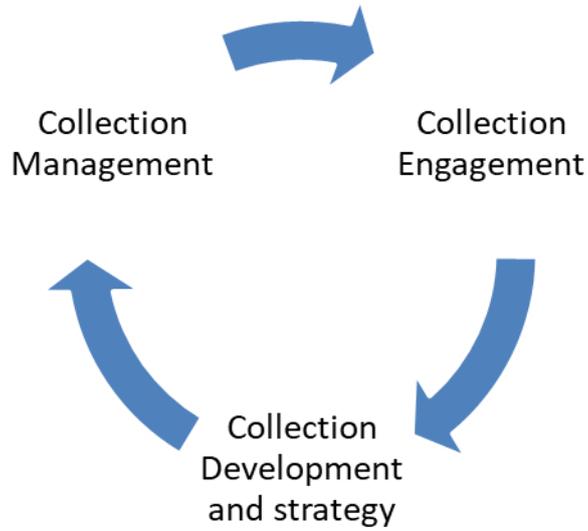
Figure 3

We recognise the importance of engagement in the collections lifecycle (Figure 3). To engage at School level, we developed our five-stage collection engagement model. We based this on the Plan – Do – Study – Act (PDSA) Cycle (Deming, 1950) and aligned it with PPRs. Part of the quality assurance process, PPRs examine of the education and student experience provision of each School at intervals of, at most, five years. Having established this model, we quickly identified that the metrics included in the School Information Sheet could inform the plan and study elements of the cycle.

Figure 4

Within that collection engagement cycle (Figure 4), the initial School Information Sheet helps identify areas we need to work together on during the mid-cycle Strategic Collection Review. It also gives a benchmark we can use to demonstrate improvement. The Strategic Collection Review offers a holistic picture of the subject collections relevant to the academic School and prompts deeper engagement. The second School Information Sheet then provides evidence that the engagement has been both meaningful and impactful as well as (hopefully) of positive outcomes.

The satisfaction metrics we include in the School Information Sheet have triggered conversations around appropriate resourcing levels to allow Schools to develop or refresh areas of the collections. They have supported IS' budget bids for targeted investment aimed at improving satisfaction in specific disciplines. They have helped create a shared narrative between Schools and IS that enables those Schools to demonstrate their support for our bids and safeguard the resources budget.

School Information Sheets have helped demonstrate the efficacy of reading lists, enabling academic colleagues to see the correlation between:

- The number of reading lists published by the School, the number updated and expenditure on resources they include, and;

- Student satisfaction with reading lists and the availability of resources they include, as measured by the IS Student Survey, and how this could be one of the factors that influencing;

- Overall satisfaction with library resources as captured in the NSS, PRES and PTES.

Where student satisfaction with library resources is low and there are few reading lists, or academic colleagues have not updated those reading lists, the Liaison Librarian is able to emphasise the importance of creating and maintaining them. The School Library Representative can then gather support from senior stakeholders for setting budget aside to purchase resources other academic colleagues add to new or refreshed lists. In some cases, this has led to direct investment from the School, one-off and recurrent budget bids or match-funding agreements with IS.

Low satisfaction coupled with high numbers of reading lists that academic colleagues regularly update may represent an indicator of the quality of those reading lists. Again, the evidence the School Information Sheet provides allows the Liaison Librarian to begin exploring the nature of the problem with academic colleagues. This is often as much about structure as it is about content and so the Liaison Librarian can offer solutions that are either cost neutral or save the School money.

Metrics from the School Information Sheet have challenged both academic colleagues' and our own perceptions around use of the physical collections and library spaces. Our shared desire to understand the drivers for these behaviours has prompted the valuable conversations we sought. Academics increasing engagement with collection development means we are able to take forward the dialogue around the balance between formats and between collection and study space. It also gives IS confidence in our vision to make the library the physical and spiritual heart of each campus.

Where academic colleagues are concerned about engagement with library collections and services, the School Information Sheet has provided either reassurance or a basis for an improvement plan. It has helped us emphasise the shared responsibility we all have to promote the collections and services available. Academic colleagues' understanding of the importance of advocating for the library is growing. Through the School Information Sheet, they are able to see the impact on students' satisfaction with modules they convene.

What comes next?

From their inception, we limited the School Information Sheet to data that was readily available. Academic colleagues' and senior stakeholders' appetite for analytics is growing. For example, they would like to understand how the usage of the same resource in digital and physical formats compares, how often students access library resources they include in reading lists, and how long students stay in the libraries and how they use our spaces. We need to evolve the School Information Sheet to respond to these agendas.

Our first priority is to bring together and transform the data we currently collect and hold. Our library systems topology is complex. We need to understand what information we hold where and create linkages between silos. We recently worked with an intern recruited as through the University's Careers & Employability Service to map our data sources, identify our data owners and experts, and set how we might bridge those gaps.

We need to provide digital collection engagement analytics that recognise, and feel relevant in the age of, the digital shift. Like their physical equivalents, which they now dwarf, those collections are reaching maturity. We want share evidence with academic colleagues that enables us to take forward holistic collection management together. We expect our data to start suggesting what the appropriate format and licensing model is in different circumstances.

We have questions about the sustainability of the School Information Sheet. We produce each one manually, tailoring it to the specific needs of the School in question. Our intern has interviewed academic colleagues to try to identify a common set of metrics that we can provide as standard. Over the coming months we will look to build a consensus between Schools so that we can take a more consistent approach.

Figure 5

We are keen to improve the look of the School Information Sheet and draw on the expertise of IS colleagues around visualising data as well creating of dashboards, for example capturing our progress with annual appraisals (Figure 5). At present, each School Information Sheet draws on information gathered, analysed provided by a number of teams. All of this requires skills and time during a period when the University is looking to achieve efficiency savings, something that the School Information Sheet should help us to realise.
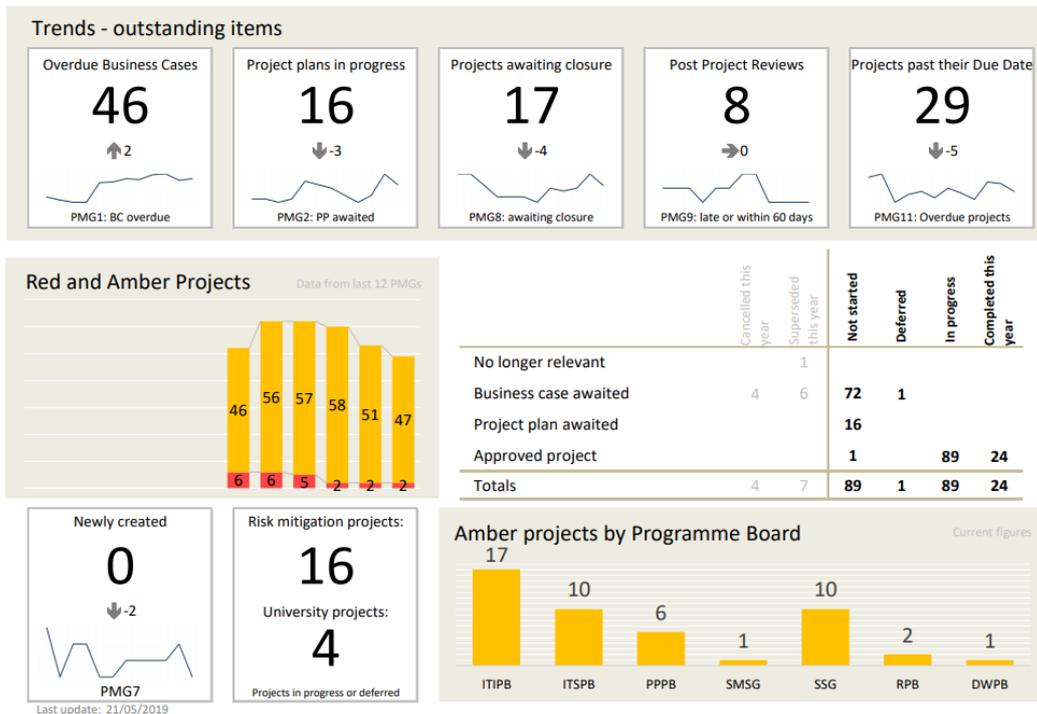
Figure 6

Having mapped our data we are now moving to technically enabling and automating data provision. We have identified gaps in our library systems topology but also some existing tools that we may be able to deploy to fill them. We need to find ways to automate production of the School Information Sheet as we have in other areas, for example around projects on our operational plan (Figure 6). If we can achieve this, we can realise our aspiration to publish one for each School annually.

The School Information Sheet has helped us build our data and analytical skills, and we have refined it as we have done so. We will continue to extend those capabilities so we can better assess our impact and performance. We are working with our IT Training team to develop a data competencies programme. We are also seeking to harness our colleagues' expertise around research data management and exploit the synergies with it.

Interest in the analytics we provide extends beyond the original audience for the School Information Sheet. Like other universities, we have analysts exploring student success and developing services and support models to help remove barriers to our students realising their full potential. We are also keen to explore benchmarking against our peer group of Universities using NSS, PRES, PTES and SCONUL data.

Conclusion

The School Information Sheet has proved a simple but effective tool to fulfil our collection engagement goals. Our challenge is to shape it so it continues providing valuable insights. We will shortly complete a gap analysis around the data we need to do this. In the coming year we will look at both the technological solutions and at how we can make the best use of our data.

To meet this challenge we need to develop and extend our skills as library practitioners. Only then will we be able employ the relevant technologies to structure, capture and analyse the growing body and complexity of data available to us. We need bring together our data experts to form a community of practice capable of sharing the expertise required to achieve our aims. Having established our proof of concept, and created our roadmap, we are now ready to start that journey.

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Comprehensive Journal and Database Review Exercises in NUS Libraries

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National University of Singapore Libraries

Introduction and purpose

The National University of Singapore (NUS) is a comprehensive university comprising 17 faculties. NUS Libraries provides access to 72,000 e-journals and 336 databases in supporting education and research. The Technical Services (TS) unit led two review exercises: a journal review exercise in 2017 comprising 12,231 actively subscribed titles, and a database review exercise in 2018 consisting of 172 databases. Both review exercises involved all resource (subject) librarians' participation and evaluated the relevance and cost per use of the Library's subscribed collection, factors which have become critical with a declining operating budget.

Literature review

Sprague and Chambers (2013) listed Bandyopadhyay and Chu's (1999) evaluation criteria for electronic journals, from which we derived user interface, accessibility, pricing, archival coverage, and usage statistics as the criteria for the review exercises. Nederhof (2006) examined the use of citation analysis in monitoring research performance of the social sciences and the humanities, including the range of publications and citation indicators used. Boukacem-Zeghmouri and Schöpfel (2013, and Uçak and Al (2009) studied scholarly communication practices in subject disciplines and research communities in the scientific fields, whereas Sula (2012) and Thelwall and Delgado (2015) explained the different measures of research impact on the humanities. All these provided the methodology in carrying out the review exercises.

Methodology

Generally, the steps of preparing for and conducting the reviews are:

1. Define the scope of review

2. Determine evaluation metrics and data required

3. Design the review workflow

4. Resource librarians review the titles

5. Consolidate and analyse review results

Step 1: Define the scope of review

The journal review scope was limited to those resources that required subscription renewal; therefore, periodical titles with no current subscription were excluded. This means that we only looked at titles for which we have payment and holdings data.

For the database exercise, we faced the challenge of definition, as a database could have full-text content (e.g. ScienceDirect), abstracts and indices only (e.g. the Bibliography of Asian Studies), or both (e.g. Business Source Premier). We scoped the exercise to include databases that:

- We subscribe for its indexing functions besides full-text;

- Provide content other than full text and have not been reviewed in the journal exercise; and

We limit each review exercise to approximately five months.

Step 2: Determine evaluation metrics and data required

TS staff consulted with resource librarians in determining the general metrics for making decisions to cancel or retain titles, and identified data required for renewal negotiations. These metrics covered three broad areas:

- Ownership and bibliographic data

- Usage data

- Citation and publication data

The following section describes data applicable to journal and database exercises, respectively.

Journal exercise

Table 1 below summarises the specific data fields used in the journal exercise.

Data Type	Field	Data Processing Required	Source
Ownership data	Title	As-is	Integrated Library System; Holdings list files
	Perpetual access as of 2017	Matched	Holdings list files, license agreements
	Vendor	Matched	Integrated Library System
	List price	Matched	Pricing list supplied by publishers/from websites
Usage data	Article downloads	Matched	COUNTER JR1 files
	Print journal usage	Matched	Print journal shelving logs
	Cost per use	Computed	Average usage for the past 3 years; latest list price
Citation and publication data	SJR	Matched	Scimago Journal and Country Rank database
	SJR — best quartile	Computed	
	CiteScore	Matched	Scopus
	CiteScore - Scopus subject areas	Matched	
	CiteScore - Combined rankings	Computed	
	CiteScore - Combined quartiles	Computed	
	Journal impact factor	Matched	Web of Knowledge Journal Citation Reports
	Web of Science subject areas	Matched	

	Combined rankings	Computed	
	Combined quartiles	Computed	
	Department published last 5 years	Computed	Scopus, Web of Science
	Department publication count	Computed	
Bibliographic data	Ulrich's subject areas	Matched	UlrichsWeb
	Call number	As-is	Integrated Library System, holdings list files
	Print ISSN	As-is	
	Online ISSN	As-is	
	ILS record numbers	As-is	
	OPAC URL	Matched	

Table 1: Data fields used in the journal exercise

Sourcing and compiling the data were intensive an exercise as the actual review itself. Table 2 summarises the data sources used in compiling Table 1.

Primary Data Source	Extraction and Transformation
Holdings list files	These files are usually part of license agreements or retrieved from publishers' websites. The fields are not standardised and require substantial effort to format them into our required structure. The files are used for mainly verification purposes.
Integrated Library System	We use Innovative Sierra. The SierraDNA feature allows for querying and data export via SQL using ODBC data connection.
COUNTER JR1 files	TS staff manually download the files from publisher admin portals. We did not use any automated retrieval solutions at the time of the review.
Print journal shelving logs	Library staff who shelved the journal issues note the action and manually compile the statistics.
Pricing list supplied by publishers/from websites	Many publishers supplied pricing lists upon request. We retrieved some of the lists from publishers' websites, taking care in applying the pricing for the tier/FTE/geographic location applicable to us.
Scimago Journal and Country Rank database	The Scimago data was downloaded as a CSV file and used to supplement the review list.

Scopus	The Scholarly Communications team obtained the Citescore data where search affiliation results were exported from Scopus and analysed before being transformed and matched to the review list.
Web of Knowledge Journal Citation Reports	The Scholarly Communications team obtained JCR data which was transformed and matched to the review list.
UlrichsWeb	We used the UlrichsWeb search API to retrieve journal metadata from UlrichsWeb.

Table 2: Data Sources, extraction and transformation

Database exercise

Table 3 summarises the fields and data provided for the database review.

Field	Data Type	Source/Remarks
Title	As-is	—
URL	Function	URLs to the catalogue records are provided.
Database type	Category	TS' database classification: • Abstracts and Indexing (A&I) database • Full-text (aggregator) database • Specialised database: non-A&I and full-text databases such as Reaxys and CEIC Data
Price SGD	Computed	For easy comparison, database prices in foreign currencies were converted into Singapore dollars (SGD).
No. of titles	Computed	This was based on the holdings list and taken from full-text aggregator databases.
DB1 Searches/JR1 Full-Text Download Statistics	Matched	If a database was A&I only, total search statistics were given. If a database contained full text, full-text download statistics were given.

Table 3: Data fields used in the database exercise

Databases have another dimension of holdings and coverage data. Table 4 summarises supplementary TS analyses to aid resource librarians in review exercises.

Supplementary Data Source	Remarks
EZProxy logs, Google Analytics statistics	Used when COUNTER statistics are not available, and/or more in-depth analysis is required. Proxy log lines required (search/download URLs) were extracted and analysed based on identified formats.

Benchmarking lists	Lists of important journals compiled by learned and professional societies were screened against the subscribed title lists to prevent important titles from being cancelled. These were supplemented with lists from the University faculties/departments where available.
Discovery service coverage list	Used to perform overlap analyses in conjunction with database coverage lists.
Reference list of University-affiliated publications	Article citations from selected journals by University-affiliated authors. These are generally extracted from Scopus and Web of Science for selected journals. The journal titles from the list were checked against the journal or database title lists.

Table 4: Supplementary data source and additional analyses

Step 3: Design the review workflow and prepare the review lists

TS used Microsoft Excel to conduct the review and manage the data as Excel supports data connection with API and SQL queries. This facilitates data retrieval from sources such as Scopus, Web of Science, and UlrichsWeb. Visual Basic for Applications (VBA) macros and functions were used to compile raw and aggregated data, together with format and validation rules for data integrity.

Two review lists were designed for the journal and database exercises, respectively. The lists incorporated data from Step 2 and the review fields. Resource librarians indicated their review decisions and comments in these lists. We designed the lists with the purpose of "Cancel" as the default renewal decision to cut costs, unless resource librarians indicated otherwise.

<u>Journal exercise</u>

The journal exercise form contained the following fields, some of which have been populated for resource librarians:

Field	Input Type	Remarks
Reviewed by	Free text	Reviewers indicated their Resource Teams.
Perpetual Access (PA) availability	Pre-populated Data Field	TS indicated whether the title was available on perpetual access basis.
PA decision	Dropdown list	Reviewers decided whether the perpetual access title was "Absolutely Needed", "Can Cancel" or "Cancel." The "Can cancel" option applies to titles that are good to subscribe but not essential. The default option is "Cancel."
Non-Perpetual Access availability	Pre-populated Data Field	TS indicated when the title was available on access-only basis. This would be applicable to access-only titles in Big Deal packages.
Non-PA decision	Dropdown list	Reviewers decided whether the access-only title was either "Absolutely Needed", "Can Cancel" or "Cancel". The default option is "Cancel."
Print availability	Pre-populated Data Field	TS specified whether a title is a print subscription.
Print decision	Dropdown list	Reviewers decided whether the access-only title is either "Absolutely Needed", "Can Cancel" or "Cancel". The default option is "Cancel."

Justify add-on E-access	Free text	Reviewers indicated whether e-access is required for print titles.
Justify Absolutely Need Print	Free text	Reviewers justified continuing the print subscription instead of converting to online.

Table 5: Journal exercise review fields

Database exercise

The database exercise form contains the following fields:

Field	Input Type	Remarks
Cancel/Must-Have	Dropdown list	TS reduced the choices to two from the previous three in the journal exercise as it lowered ambiguity and decision paralysis. Resource librarians decided whether to cancel or retain the database. If indicated "Must-Have," the cell is formatted red until the next five fields below are completed.
Alternative Subscribed or Open Access Databases	Free text	Resource librarians specified whether there are other suitable subscribed or open-access databases.
Database in review vs. alternative database — choose one to retain	Free text	If an alternative database was available, resource librarians to choose which database to retain.
Reasons: How is the database crucial in research and teaching?	Free text	Resource librarians showed resource usage examples (e.g. for modules) and how they filled a demonstrated collection gap.
Reasons: Content comparison with alternative subscribed or Open Access databases, or discovery service	Free text	Where alternative resources were identified, resource librarians determined any content overlap within those resources. TS provided overlap analyses of the databases and discovery services.
Ease of use	Free text	Resource librarians stated qualities of user interface design, compatibility with major browsers, and more subjective elements, e.g. how easily it integrated into users' research and study workflows.
Other remarks	Free text	Other remarks not within the scope above. Usually, resource librarians indicated cancellation reasons here.

Table 6: Database exercise review fields

Step 4: Resource librarians review the titles

Each resource (subject) team lead coordinated the review exercises for subjects under their charge, which includes consulting library users on their recommendations. Given the interdisciplinary nature of several titles, TS did not allocate the journal and database titles to individual teams. Therefore, each team selected the titles under its purview.

Each subject has its own peculiarities and assigned different degrees of importance to the various attributes. For example, humanities scholars may prefer to publish in media, i.e. monographs (Thelwall & Delgado, 2015) other than journals

(Nederhof, 2006), especially titles of local and regional interest. In addition, humanities authors "credit each other less frequently" (Sula, 2012, p. 32) and "often cite materials over 10 years old and rarely publish multi-authored articles" (ibid). Such factors have implications on usage and citation metrics. Therefore, no uniform standards and methods could be applicable to all titles. Even with the same metrics (e.g. COUNTER JR1 statistics), the magnitude and significance are different across disciplines.

Communication was crucial during all stages of review. TS first circulated the review list and held a communication session with all resource librarians before the exercises began proper. Resource librarians engaged faculty and students when evaluating resources. The reviews were an iterative exercise; the evaluation workflow evolved as the review progressed. Teams became more proficient in interpreting the data as they evaluated the e-resources; they sought clarification and pointed out any data gaps and nuances. These shortcomings were subsequently addressed using supplementary data (as represented in Table 4), and the analysis was streamlined.

Step 5: Consolidate and analyse review results

Resource teams returned the respective lists to TS upon completing the review exercises. The results were consolidated based on the controlled fields of the dropdown lists, namely "Absolutely Needed", "Can Cancel" or "Cancel" for journals, and "Must-Have" or "Cancel" for databases. We chose a conservative approach using the final review decision of "Must-Have" so long as one resource team indicated so. The overall consolidation of database results took substantial manual work due to the free-text fields.

Figure 1: Consolidating journal review results in Excel: screenshot

The consolidated file content was then split by vendor. TS analysed each vendor file by summarising the number of titles to be cancelled and retained, and then calculated the list price value of these titles. TS also calculated the journal cost per use based on JR1 and JR5 figures of the latest available year (typically 2016), using both list price and offered price. Despite using JR5 figures to calculate cost per use for perpetual access subscriptions, we switched to JR1 as JR5 disregarded pre-2016 usage which unfairly overstated the cost per use. Using JR1 also made the analysis easier for all titles.

Findings

The review results are as follows:

Journal exercise

Recommendation	No. of Titles	
Absolutely Needed	3,275 (26.8%)	
Can Cancel	1,868 (15.3%)	
Cancel	7,088 (57.9%)	

Table 7: Journal exercise review results

Database exercise

Recommendation	No. of Titles	
Must-Have	130 (75.6%)	
Cancel	42 (24.4%)	

Table 8: Journal exercise review results

In practical terms, 441 journals and 15 databases have been cancelled as of July 2019, some of which are in packages.

Resource teams used different methods to coordinate the reviews and manage the large volume of data. Most teams used the Library of Congress (LC) call number ranges to select titles for review. Experienced resource librarians also reviewed titles outside of their own direct subject areas. For example, the Economics resource librarian reviewed behavioural science titles classified under Psychology.

We did not cancel many of the titles marked for cancellation, as most of these were part of packages and it would be uneconomical to cancel them. Instead, we utilised the review results in vendor negotiations by demonstrating the differences in perceived value (in terms of list price value for Must-Have titles) against the package price offered by publishers. We also considered the ancillary fees that the University paid to the publishers, e.g. advertisements and APCs to estimate the total revenue that publishers derived from the University. For this, we collaborated with the University Office of Finance to create a special ledger for APCs for future tracking.

Substantial savings were reaped from the cancellations and renegotiations, enabling us to overcome the unexpected budget reduction and revised procurement processes. We were also able to redirect resources to support emerging research areas and initiatives, such as digital humanities, and strengthen NUS Libraries' standing as a Southeast Asian resource hub.

Practical limitations

The journal and database review exercises were launched from the perspective of ensuring relevance for renewal purposes. This imposes several limitations:

1. Cost effectiveness was a dominant narrative in these reviews. This was tempered by the arrangement where resource librarians only reviewed content relevance and did not usually consider absolute cost early in the review.

2. We did not consider holdings of ceased subscriptions in our collection, which would be useful for overall collection assessment and weeding of print journal issues.

The heterogeneity of the subjects and teams also posed some challenges in the review processes:

1. Unequal distribution of titles among all teams due to the number of titles in different subject areas led to teams developing different workflows (e.g. review by elimination or selection; title-by-title review). It was impossible to compare the results of one team against another even though the responses were in the same format.

2. Resource librarians have varying degrees of skill sets and subject familiarity due to years of experience. Some were able to justify review decisions easily, while others required more effort or assistance. Nonetheless, the exercises gave all resource librarians an opportunity to be overall acquainted with the collection, review processes, and collection development.

3. Interdisciplinary titles and availability of review data posed their own challenges. Scholarly communication practices vary among disciplines (Uçak and Al, 2009) and communities (Boukacem-Zeghmouri and Schöpfel, 2013). TS and resource librarians needed to balance stakeholder interest in ensuring that all subjects and decisions

were duly represented and considered, including ensuring that no title was overlooked and/or accidentally cancelled due to the default cancellation option.

Next Steps

NUS Libraries conducted the journal and database reviews over a two-year period, resulting in a more relevant collection and substantial savings yielded. A framework for a more systematic review process is being drafted with the involvement of several teams. This is a good example of an effective collaboration amongst the library Collections, Resource, Technical Services, and Assessment teams, incorporating lessons learnt from the exercises into the framework.

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Creating, Recalibrating, and Collecting Assessment Metrics for Strategic Initiatives and Annual Reporting

A Case Study at Virginia Tech

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Abstract

Purpose

This paper presentation shares the approach taken by the Data Analytics Team at the University Libraries at Virginia Tech (Blacksburg, VA, USA) to create and execute a program intended to streamline measurement outcomes tied directly to library strategic initiatives. Further, it provides insight into the challenges of adopting a systematic approach to measuring the impact of strategic initiatives, as well as discusses implementation practicalities. The program includes three essential components: 1. holistic integration of library strategic initiatives into the daily processes and procedures, 2. impact methodology, and 3. annual reporting processes for metrics communication.

Design, methodology or approach

In 2017, the University Libraries created its 5 year strategic plan. The plan included 10 strategic areas, 29 initiatives, and over 115 metrics intended to measure initiative success or impact on patron success. Starting in late 2018, the team re-evaluated the metrics and took steps to implement and integrate data collection strategies into the annual reporting structure. The team directed and guided colleagues through collaborative working sessions and included all levels of staff. While individual strategic initiatives are in different implementation phases, the presentation includes an account of data collection methodologies, data presentation practices, and data-driven decision-making in practice.

Findings

One of the most difficult and time intensive parts of the metrics review process was scheduling meetings, and overall success of the process was mixed. Review of metrics found that about 35 percent of the revised metrics were known to be uncollectible. However, once further into the collection process, the percentage increased to 55 percent. Metrics were reduced from 115 to 93 but the metrics but became more complex. The amended metrics were able to provide a basis for data collection for future budget models. Formal data management practices are needed. Much confusion exists because no central data dictionary currently exists and the University Libraries lack a standardized data collection system.

Conclusions

Gains were made in standardizing of University Libraries data collection, especially in making connections between different departments that may be working in the same strategic areas. The Data Assessment Team was able to gain direct access to departmental data that was previously not available. The communication between departments and the Data Analytics team increased, and anecdotal feedback leads the researchers to believe that trust levels increased, especially in terms of the teams' ability to ensure data privacy.

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Developing a re-usable methodology to conduct a review of Library resources

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Introduction

In 2018 the Open University Library undertook a project to review some of its higher cost resources. As part of this work we evaluated how we should go about the reviews and decided to start by asking the question "why are reviews like this needed?"

One of our starting points was to look at the international project TERMS: Techniques for Electronic Resources Management which began in 2008 and grew out of a discussion between the authors over a lack of consistency in e-resource management practices. TERMS aimed to set out an e-resource life cycle and to define a set of best practice using real world examples gathered from libraries in the UK and US. One key part of the life cycle is on-going evaluation to ensure the resource remains of value to the institution in satisfying its research and teaching aims. TERMS suggest that once purchased resources should be reviewed between 3 and 5 years after first purchase and then annually thereafter. Also, that "in order for the evaluation to be most beneficial to your institution, the librarians at any given institution must first agree on which data points they would like to use to evaluate their electronic usage and then set consistent methods of collecting and reporting these figures from one year to the next" [1].

We agreed to start the project by developing a methodology for our resource reviews and using this to evaluate the resources identified as high cost content. The methodology takes the format of a series of questions about the resource to be evaluated and suggests the data to use for each stage of the evaluation. It was developed out of our existing methods for evaluating our content using a lighter-touch annual resource review consisting of recording use (usually COUNTER data) for each resource, using metrics to show cost per use, and providing minimal background on the resource such as when it was purchased and for what purpose it is used.

It must be pointed out that the current methodology, as detailed below, has a significant weakness in that it doesn't involve any qualitative evaluation to ask users what their resource needs are and if they feel that their needs are being met by the resources provided. The lack of qualitative data to support resource reviews needs to be addressed by further research which must also suggest ways of doing this as an on-going activity such as developing a standard set of survey questions that can be run regularly.

Methodology questions

What is the resource called?
What is the exact name of the collection/resource we take? This should be what the publisher/supplier calls the resource.

Whilst this seems straightforward it was interesting to see how a single resource could be referred to by different names across the Library. It could be called one package name by the provider, recorded as something different on the library management system and referred to by a different name on the Library's web site. This causes confusion when trying to report on a resource's use as you need to know exactly what you are reporting on and how that ties in with the resources exact cost. It can also make it difficult to track a resource we've had for some time if it has undergone name changes.

What is it?
Here we provide a relatively detailed description of the resource that explains the type of content it includes, and which subjects it covers. An example would be the description given for a collection in the 'Full details' pages of the JISC website. In terms of the subjects the resource covers, we have generated a separate spreadsheet of subject categories the OU currently uses to group students for its annual facts and figures reports.

It has proved very useful to document more information about the resources and which subject areas they cover. The project has uncovered a potential lack of awareness of the sheer breadth and benefits of some resources the Library bought more than five years ago. If people are not aware of the content and coverage of the resources we already have there is a danger they will buy very similar content from another provider leading to duplication. It will also help us to actively sell the benefits of our resources to faculty and students if we understand the full content of what we have purchased. These reviews should help in this process.

Another part of this question looked at which subjects the resource covered and how these matched OU teaching and research areas. Currently the University has been classifying courses by JACS codes but are in the process of transferring to HECoS codes. As this work was still underway we decided to use the broader subject areas used for classifying and recording student numbers on the annual facts and figures reports. This enabled us to match those subject areas for all higher

cost resources and link it with student numbers in those subject areas over a 7-year period. Further work may be required to align resources with HECoS codes once fully adopted by the University.

> **How long have we had it?**
> This information can be collated from the emails we keep which hold information back to the year 2000 along with the licences for the resource. It is useful here to explain if the resource has evolved from an earlier collection and what it may have been called previously.

It took a significant amount of time to track some resources through our records. We have an extensive file of email data, back to 2000, and large holdings of paper licence files on most resources. Other paper records can provide information further back, and for most online resources their original purchase is unlikely to be earlier than 1996 in the online format, although some were available previously as printed indexes or CD-ROMs.

> **Why did we buy it initially?**
> This information may be included in the emails mentioned above (or in the licence files).

This question was particularly hard to provide a clear answer to for many of the resources. Where there were records they were often brief and likely to be contained in an email response. It should be possible to keep records of why a resource was purchased, and why it has continued to be renewed. A more systematic way of recording the rationale for purchase of a resource should be recorded in our acquisition system and with the original licence for the product, possibly as part of an order request sheet.

> **How does use now differ from then?**
> Think about how the resource may have been used when it was initially purchased and how it may now be being promoted to module teams, researchers or through social media. We may have the initial discussions from when the resource was purchased but this isn't always the case. Is it being used in any library skills activities? Include any information about Open Access content within the resource.

Again, if we don't know why the resource was purchased initially it is hard to say if we are using it in a different way. From the perspective of the project we found it very difficult to quickly and easily find out how and why the resource was being used without going to the users themselves. This goes back to the earlier recommendations on asking users about their resource needs and use.

> **What does it cost?**
> Use the information given in the library management system. If you are looking at a collection that is in a deal give all the financial information for the years of the deal currently active. Provide the GBP equivalent pricing we paid if we are invoiced in another currency.

The cost information for the last four academic years was available in the library management system and so finding the information about the resource costs was relatively straightforward. This information is key to any cost per use analysis. The harder information to obtain in terms of costs was information about what individual journals or packages would cost outside deals. Sometimes even the providers were unable to give us such information easily.

> **How do we currently buy it?**
> Explain how we buy the content currently, for example there may be information we can use from the JISC website that explains a journal deal.

This data was held within our file of email data and large holdings of paper licence files. For some resources, we were also able to refer to the active deal information on, for example, the JISC website. In most cases it is easy to distinguish which deal we have in place but where there are complex deal offers it isn't always clear exactly which elements of a deal we may have in place and this needs to be made more explicit on the order sheets when we place an order. We need a systematic way of recording the elements of a deal we have taken when there is more than one option and this needs to be recorded in the library management system and with the original licence for the product, possibly as part of an order cover sheet.

> **Is there any other way of buying it?**
> Explain if we have any options other than a deal if that is what we are currently taking. This could be an alternative supplier, an alternative deal or going direct to the publisher/supplier.

Generally, for the bigger deals it was possible to answer this question by looking at details of the deal. In some cases, you could find alternative options on the publisher or supplier's website. However, finding any cost information was harder without asking the provider directly. In most cases we tended to buy the resource in the most cost-effective way currently, although there were some resources where an alternative provider would also offer the same collection. Each renewal needs to include time and effort in looking at the alternative suppliers for any products, or a statement to say that there is only one option for purchase.

> **Are there options for downsizing within the current licence?**
> If the current deal has other options explain those and any costs if available.

As above, often for the big deals we could see any potential options for downsizing, in other cases there may have been information on the provider's web pages.

> **Would downsizing have any implications for staff time/cost?**
> Provide a brief explanation of the impacts changing our current deal could have on costs or staff time.

This question was only answerable from experience of where we had previously changed elements of a deal or collection. Often even a simple change can lead to requirements in staff time in re-aligning access for the collection within the library management system. When there have been significant changes in the past e.g. moving CRC Press content from subscriptions to an evidence-based access model, we have written up a recommendations document that details the implications of the change. Any significant moves or changes should be documented as case-studies to supply information on how these affect staff time/costs.

> **What do we retain if we stop subscribing to it?**
> Briefly explain the current post cancellation provision if we have that detail. Point out that it will only relate to the current deal. If it is a deal with subscribed (core) content and non-subscribed content, show the impacts of cancelling the deal by giving the total number of titles we would lose access to in a separate tab. Make a note here of any other holdings we have for the content e.g. back files purchased in perpetuity, packages of archives.

The post-cancellation access is covered in many of the larger deals, but the title by title information and implications of cancelling a deal are very detailed and specific to the individual collection. For some of the deals we were able to give broad guidance on which years we would retain but if a cancellation were to be made each collection would need to be looked at in significant detail. Opportunities to find ways of managing post-cancellation access should be investigated, for example, by participating in projects by JISC and EDINA to help in this regard.

> **Who is paying for it?**
> This detail is in the library management system. If it is split between different faculties then provide the percentage of the splits and the amounts paid (last full financial year).

The information about which faculty fund pays for the resource is held in our library management system for the past four academic years. Any earlier data tends to be discoverable through email records.

> **Who is using it?**
> We obtain some of this information through running a report on EZProxy logins for the past full calendar year, to show both staff and student logins by faculty. For resources with journal content we can also look at whether people have provided articles from individual journal titles to the University repository (ORO).

For the resources analysed in this project we used the EZProxy login data to see which faculties were using each resource, we were also able to see which of the logins came from staff or students. The EZProxy data can also be interrogated further in terms of module use, but the time required to analyse the logs was not feasible in the scope of this project.

> **Why are they using it?**
> We need input here from use of LibLink (for use in modules) and from the subject librarian team who will have a clearer idea of where this resource may be recommended.

LibLink is our in-house system that records library links being used in VLEs. This was particularly helpful for the large journal collections where we can see if they use a general link to a journal title or more granular links to individual articles. We obtained data on submissions to ORO to act as a proxy for some element of research use for journal packages but as mentioned previously the only way to really answer this question is to ask the users themselves. A possible change in how we manage links for modules (e.g. moving to reading list software) will have implications for this kind of data gathering going forward.

> **What are the trends in usage?**
> This is taken from the usage data in JUSP for the last two or more financial years if available, or from the providers own data. Use the relevant COUNTER report for the type of resource you are evaluating and compare use year on year.

The previous light-touch annual resource reviews held usage data back for several years (in many cases to financial year 12/13) and so were able to provide the usage data trends needed. What this project has shown is the value in retaining this data which needs to be collected in a systematic and regularly occurring way. Like the majority of Library's, we rely on COUNTER data and have benefitted greatly from the introduction of the JUSP (JISC Usage Statistics Portal) as a method of

harvesting, storing and maintaining COUNTER data for many of our resources. JUSP even provides trend reporting as a standard report and as a graphic.

Is there a similar resource? If yes, then how do the two compare? What is the relative use of each?
For journal collections do an overlap analysis using tools in our library management system (ExLibris' Alma), checking whether the titles are covered in any of our major aggregator collections. For journal aggregators compare whether the titles covered are in any of the major publisher collections, and in a separate analysis, how they are covered by other major aggregators. For database collections which are abstracts and indexes check whether we have a collection covering the same subject area or look at how the subjects covered would be indexed by Scopus or Web of Science. For book collections do an overlap analysis comparing the collection with aggregators such as Credo or Academic Complete. Mention any data you have on use of the similar collection, such as how much it is used and by whom.

For the first group of resources we analysed we looked at other potentially overlapping resources, although for the large journal collections they don't overlap with each other, only with aggregated sources. As the reviews progressed it became clear that most resources had excellent use across the University and that we would be unlikely to wish to withdraw any of the major packages. However, there may be levels of overlap between aggregated sources and subject indexes that could be worth investigating. Another part of the reviews looked at this in detail and a separate overlap methodology was followed. As new resources are recommended we need to actively analyse potential overlap with existing collections before purchase. This is especially important where the new resource is aggregated or a subject index.

What would be the impact of not having it?
This is detailed work that needs a detailed analysis of usage at title level including use in specific modules. This is provided by the analysis in 'Why are they using it?' and, pricing of top used titles outside of a deal. By obtaining a list from the publishers of their current journal prices, if it is a journal collection, and using the long tail information we could see how many of the top used titles we would be able to purchase. We could also look at where access would be denied if only top used titles were available. This is particularly relevant for the journal packages where we still buy individual subscriptions. Where we only pay an access fee for some titles they would be lost if we cancelled the deal. Mention the loss of access (percentage lost) to individual titles that don't have post cancellation access. Look back at the data we have on who is using it and what for to discuss this in more detail.

This was another difficult question to answer without involving users and understanding their current needs for the resource in question. In most cases we could see which elements we would likely retain if we had cancelled the resource, particularly with the large journal packages.

Do other universities use it?
Do we have any benchmark data for the collection (e.g. for the journal collections use JUSP for the latest full financial year)? Any other information may come from the provider themselves (e.g. case studies from other institutions on their website) or emails. JISC pages may also give an indication of take up of their deals. We may also have anecdotal information from contacts in other Libraries.

Some benchmarking data for the larger collection was available in JUSP and we could see which of the large University groups had access to the collection and the use they made of it in terms of overall usage figures. We could use connections in other institutions or checking other Library websites to see who else had a subscription. JISC collections have also previously given us information on subscriptions to their deals by different JISC banded institutions.

Conclusion

Following the methodology developed, enabled us to examine in greater detail the higher cost resources we buy. Some elements of the methodology need to be regularly updated (e.g. annually) whereas others will just need minimal updates as the resource evolves (e.g. the information about what it is). One caveat on the work carried out so far is that the methodology has been primarily used to analyse the large journal packages. Some of the questions would not require the same level of analysis for other types of resources e.g. subject indexes, where there wouldn't necessarily be an option to downsize, or any post-cancellation access.

We were able to use time spent during the project to calculate how much more time would be required to use the methodology to review other resources (mid cost content) and this has been used to develop further staff planning documents.

References

[1] TERMS: Techniques for Electronic Resources Management, available at: https://library.hud.ac.uk/blogs/terms/ (accessed 28 June 2019)

Developing digital audience frameworks for Oxford's gardens, libraries and museums

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Abstract

The Gardens, Libraries and Museums of Oxford (GLAM) include four museums (natural history, history of science, art/archaeology and anthropology), a botanic garden and arboretum and the Bodleian Libraries (a system of 28 different libraries). Between them, they attract an extraordinarily diverse audience of over three million physical visitors and six million digital visitors covering a full range of subjects. GLAM institutions are all working to implement their shared digital strategy which aims to drive access to collections - but the institutions had no shared (and in some cases no individual) sense of digital audiences. In order to develop a common but flexible framework for strategic planning and project evaluation, the GLAM institutions undertook a substantial strategic process for defining digital audiences, undertaking user research to inform a new audience framework consisting of archetypes and pen portraits, which in turn is feeding a new strategic approach and the application of the research across the Bodleian Libraries' web redevelopment.

GLAM worked with external agency Modern Human Design to craft a research approach. This involved pulling together all existing audience research across the six institutions (audience surveys, web statistics, in person and digital visitor numbers, personas) and developing a plan for addressing gaps any gaps that emerged. We used qualitative and quantitative techniques to understand how visitors were engaging with GLAM digitally: visitor shadowing, exit interviews, diary studies, remote interviews, social media and Google Analytics evaluation. From these, we focused not on demographics but on a set of motivational archetypes that apply to visitors across the GLAM institutions as well as a set of pen portraits to support those archetypes, and a template for creating new portraits in the future to enhance the framework. This approach has been innovative for GLAM which has, to date, relied largely on demographic profiling or cultural segmentation rather than behaviours and motivations to understand its audiences.

The framework of archetypes developed is useful in its own right as it gives the GLAM institutions shared language and focus; however, it was also key in helping us to develop our 'blueprint' of digital priorities over the coming three years that outlined how our digital output met the needs of all audiences from a bottom-up user perspective, rather than only through top-down institutional decision-making. We were also able to use our findings as a powerful tool to advocate for user needs and allocate money accordingly; for instance, we have the data to articulate that being able find links to items across various collections is a need of multiple archetypes, including researchers, students visitors and the more casual 'engaged explorer', which has led not just to thinking about research-based linked data but also to more light touch ways to surface the breadth of our collections via Google and Wikipedia.

Most relevant here, learning from the user research hugely informed the Bodleian Libraries' website redevelopment. The Libraries' are running a multi-year project to migrate over 35 websites and more than 2 million visitors. Our website visitors range from the tens of thousands of students and researchers in Oxford to tourists wishing to visit our historic buildings and international researchers on short visits. We knew that initial user research would be a hefty task; but the framework has been key in directing us to the areas where we can be most efficient - thinking about what our visitors need and the pain points that digital may create for their visits. Our user testing and interviews have probed those issues more deeply, for instance exploring the interaction between collections databases and our sites, testing a radically streamlined approach to our web content and looking at ways to ensure that our digital content felt accessible to the casual visitor. While we still have further rounds of testing scheduled, our work is already showing that the website plans provide a better experience for not

only regular researchers and undergraduates, but our other archetypes - teachers who struggled to see the way the Libraries could support them, engaged members of the public who couldn't find out whether they could visit, researchers looking for the services we provide them and more.

Our work was thorough but representative. Visitor needs change over time; we're confident that we were able to capture all of the major archetypal motivations of our visitors – both existing and potential – but the pen portraits may need to be updated, so we developed templates for the creation of further pen portraits to ensure the framework is adaptable in the medium term. Two areas where the portraits fell short were for academic researchers and students; the Bodleian Libraries project was able to address this by including further academic interviews and research, contributing to a fuller picture of our users across GLAM.

Bringing a number of institutions together, particularly those serving such a range of audiences, is an unusual project. Introducing six institutions to a common language and way of thinking about their audiences is a huge task but will transform GLAM's approach. Giving them a strong digital audience framework within which to work and plan places them in a place of strength, able to address audience needs and support cases for funding accordingly. The Bodleian Libraries work within that framework shows that such a body of research isn't solely high level; it can be applied on an institutional and project level to great effect.

Although other institutions have led audience research using many of the techniques we did, applying them over such a range of institutions and visitors raised unique challenges. Focusing on motivations rather than demographics is a less common way to approach digital audiences, but it has proved accessible to staff members in thinking about their audiences. Developing such a cohesive framework for digital audiences before undertaking strategic planning and specific development projects proved a valuable piece of work from which other institutions can learn.

This paper has been submitted to the Conference Special Issue of Performance Measurement & Metrics

Displaying Your Impact

Connecting Library Data to Student & Faculty Success

John McDonald

EBSCO Information Services

Michael Levine-Clark

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Abstract

The value proposition around library services & content and how libraries contribute to student and faculty success is of preeminent importance in today's higher education culture. Libraries are increasingly being asked to justify their contribution to the educational mission of the institution, yet lack the tools and resources necessary to present strong quantitative evidence of impact. In addition, librarianship's culture around protecting patron privacy is often in conflict with tracking user behaviour and user analytics. Institutions of higher education are moving forward rapidly with incorporating advanced learning analytics into their institutional outcome measure to gauge performance along a continuum of educational success metrics. Libraries have largely been left out of these initiatives for a variety of reasons, although efforts across the US, Europe, and Australia are aiming to incorporate library data into overall campus learning analytics efforts. This presentation will feature two speakers focused on advancing the art of library analytics and moving library specific user & usage data into the overall learning analytics initiatives on campus.

Paper

Case Study details can be found Open Access on the EBSCO website, so not included in Conference Proceedings

European Academic Libraries KPIs

How comparison helps decision-making

Cecile Swiatek

ADBU

Abstract

In 2018, the French academic libraries directors association (ADBU) took the initiative to launch a European comparative study on Key Performance Indicators in Academic Libraries over the 2013-2016 period.

As universities and academic libraries are facing research evolutions and teaching/learning new models, a strong increase in students' number is observed everywhere in Europe. This trend will most probably continue in the coming years and the pressure on academic libraries will grow. That is why the French academic libraries directors association (ADBU) took the initiative to launch a European comparative study on Key and Performance indicators in Academic Libraries over the 2013-2016 period.

Thanks to our European partners and the help of a consultant firm, the first observations were updated with the 2017 figures and the country scope grew broader. Libraries buildings and equipment, space and seats per student, opening days and hours, frequentation rate, library services, users training, staff per student / documentary budgets / total expenditure, staff training, documentation loans / consultation / downloads : these KPI are gathered and can be compared in both relative and absolute value.

This paper briefly presents the ADBU initiative; its main focus is how to use these figures to ground decision making process, notably so as to better assess the contribution of libraries in student success or research performance.

This paper has been submitted to the Conference Special Issue of Performance Measurement & Metrics.

Evidence-based Collection Management as a Tool for Transitioning to a New Library

A Case Study from University of Wales Trinity Saint David

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Introduction

In August 2018, University of Wales Trinity Saint David (UWTSD) opened a new, purpose-built campus in Swansea, which included a new library, Y Fforwm (Figure 1). The new campus replaced two legacy campuses, which each housed separate libraries, and the University's Library and Learning Resources (LLR) service faced the challenge of moving the collections to the new build.

Rather than design the new library building around the existing print collections, a strategic decision was taken to focus on the wider range of services offered by LLR, providing high quality learning spaces and maximising opportunities for students and academics to benefit from the University's electronic resources. In the new three-storey library, only one floor was allocated for housing print material, providing 1,200 linear metres of shelving capacity, with one floor dedicated solely to study space and support, and the other providing a range of teaching spaces.

As the existing stock at the legacy libraries measured 2,000 linear metres in total, a considerable reduction in print holdings was necessary to allow the collection to be accommodated in the new library with room for future expansion. The collection has an undergraduate, rather than research, focus, and the library can offer alternative delivery mechanisms for low-use material. LLR therefore chose to adopt a 'just in time' model of collection management to exploit use of physical space while providing a smaller core print collection. A comprehensive, data-driven assessment of the legacy collection was undertaken in 2017-18 leading to a 60% reduction in print stock, while at the same time PDA (Patron Driven Acquisition) was introduced to provide staff and students with immediate access to 50,000 electronic books in the same subject areas as the material being deselected from the print collection. This case study explores the collection review process, and the impact that the work has had on usage levels in the first year of service at the new library.

Figure 1: Y Fforwm, University of Wales Trinity Saint David

Methodology

UWTSD operates five main campus libraries in three locations in Wales: Carmarthen, Lampeter and Swansea. Prior to a service restructure in 2016, different approaches to collection management were in place at the University's campus libraries. UWTSD Carmarthen and Lampeter libraries had adopted a Collection Development Policy in 2012-13, however no equivalent policy was in place at UWTSD Swansea libraries. The formation of a new Collections Team and the need for clear selection criteria in advance of the move to the new library acted as a driver for a more comprehensive, university-wide Collection Development Policy, introduced in 2017-18, and this outlines clear, consistent guidance for retention of stock. The new policy clearly defines management of the collection as the responsibility of the library service, providing the necessary ownership to make effective decisions using data analysis. This policy served as a framework for the review.

A year prior to the move, in summer 2017, a project team was formed to carry out a thorough review of the collection at the legacy libraries against policy criteria based on age, circulation history and subject classification. The collections were physically measured, and the total space for each separate sequence was divided by the number of items shown as available on the University's Alma Library Management System (LMS) to provide an estimated shelf capacity in items per metre while allowing for resources on loan or missing. Results ranged from 38 items per metre for the main circulating collection to 100 items per metre for the teaching practice collections, which are formed of children's reading material and classroom workbooks.

Comparing the data held on Alma against the physical measurements for each collection made it possible to estimate the number of books that would need to be archived or withdrawn for the collections to fit the allocated space in Y Fforwm, while also building in room for future expansion. A brief literature review was undertaken to check the calculations and identify best practice in allowing room for growth, with 80% fill capacity chosen as recommended by Lushington et al. (2016) to allow growth up to a maximum working capacity of 86% to aid re-shelving (Habich, 1998). This provided a target of 960 linear metres, necessitating a reduction in stock of over 50%.

Automated reports were produced using the Alma LMS, which identified stock that had not been loaned or purchased within the last 7 academic years, and this was highlighted for review and possible archival or deselection. Items with low usage levels but deemed to be of future research value were relocated to closed storage at the University's Lampeter library, which was repurposed as a service-wide archive. Staff with day-to-day working knowledge of the libraries were included in the project team and given authority over the final classification of each item to ensure clarity of decision-making roles and retention of the resources of maximum benefit.

During the review, the collection was physically labelled and categorised using "work orders" on the Alma LMS. It was originally planned for paperless categorisation to take place using Alma on tablet computers however, in practice, the Wi-Fi connection was not strong enough in many areas and the project team resorted to paper-based lists, with records adjusted via Alma on desktop PCs once items were located and physically marked. The work order classification proved valuable in allowing progress reports to be collated using the Alma Analytics software, and for items to be batch processed for withdrawal or relocation at the end of the project.

Circulation data was used by the LLR Customer Services team to plan the shelving arrangement in the new library, identifying likely areas of high and low demand within the collection, and suitable locations for the start and end of the sequence in conjunction with building layout and entrance locations. UWTSD uses Dewey Decimal Classification (DDC); for each of the major classes, the total number of items was calculated along with the average number of loans per item. The data was then further subdivided into divisions of ten within the major DDC classes, providing a breakdown of the composition of the collection and usage levels for each area (Figure 2). Over 40% of the collection consists of education resources classified in the 370s; the remainder of the collection covers a variety of subjects and the analysis shows particular demand for psychology and health titles.

To account for changes in the University curriculum and changes in demand, the average date of last loan for each DDC division was also calculated (Figure 3), which, when compared to the previous analysis on overall mean loans per item, suggests a recent increase in demand in some subject areas, particularly for engineering and architecture books.
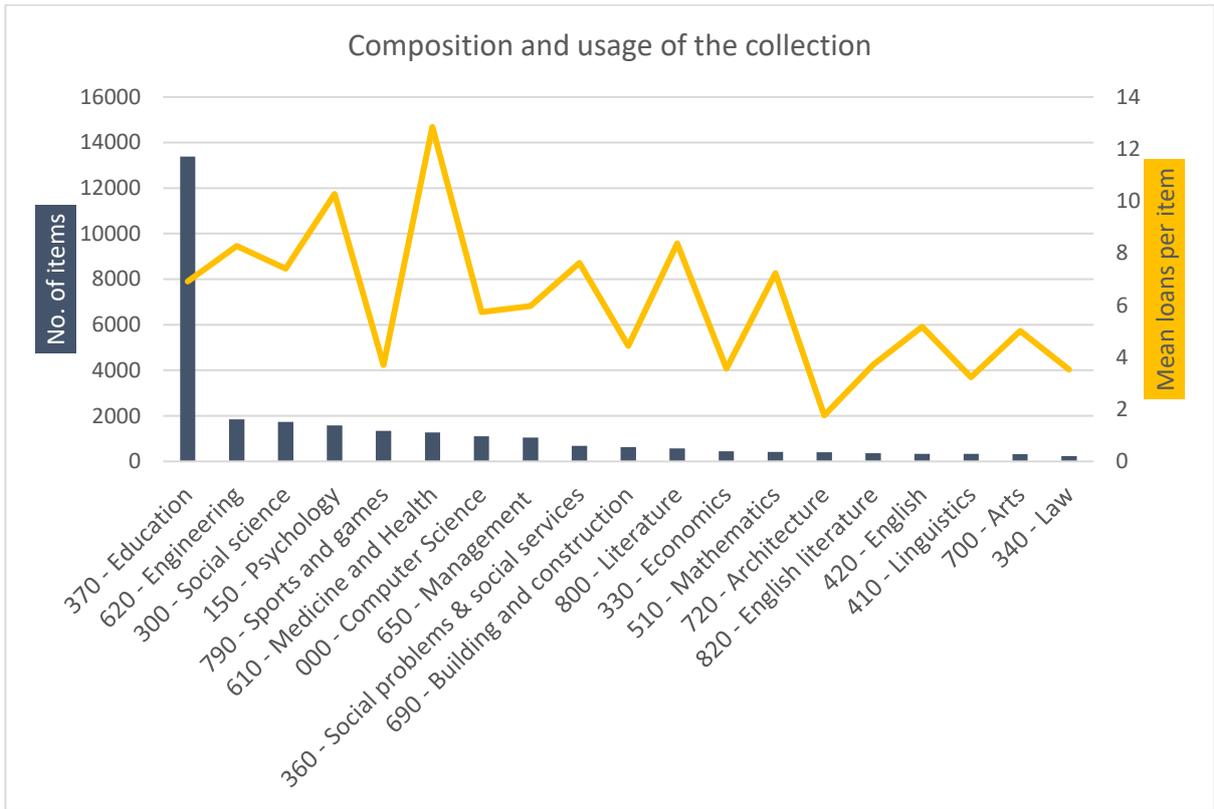
Figure 2: Composition and usage of the collection
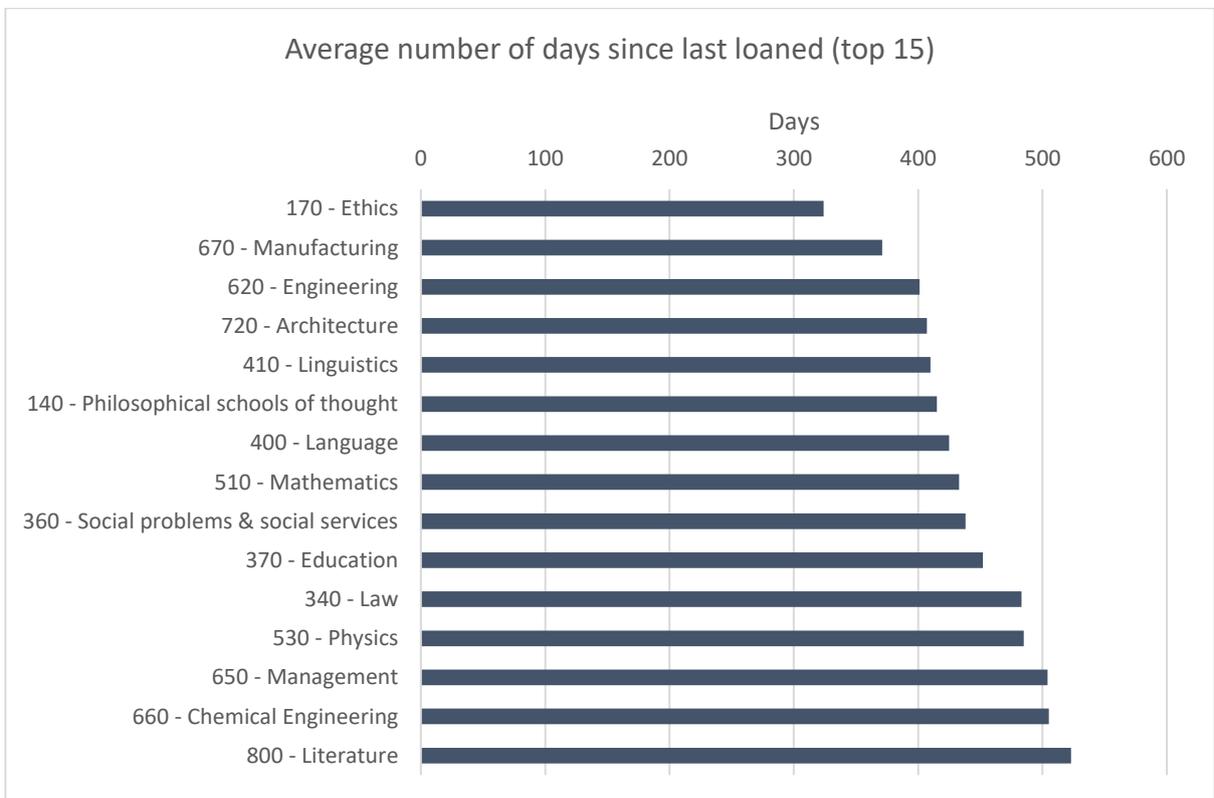
Figure 3: Average days since last loan by Dewey Decimal Classification

Existing loan categories were also reviewed, with all stock being reclassified into a unified weekly loan period with automatic renewal. Previously, material was divided into several loan categories which included reference only and short loan (1 or 2 day). Circulation data showed that the short loan categories were no longer an effective way of providing access to stock: only 45% had been borrowed at all since data was first collected and the average short loan book had not been loaned in over 15 months. At one library, the average book in the main collection with the standard 3 week loan policy was borrowed more recently than short loan stock, and anecdotal evidence from staff suggested that students were more likely to borrow the same titles when available with longer loan periods. Approximately 4,900 reference resources were also made loanable as part of the collection review. The new loan arrangements served as a pilot scheme during the 2018-19 academic year, with the intention of rolling the policy out to all of the University's libraries in 2019-20.

Investment was also made in the University's electronic book collection, with print circulation data from the legacy libraries used to identify subject areas for a Patron Driven Acquisitions (PDA) project. As a starting point to ensure a selection of material relevant to the current university curriculum, further circulation analysis of the print collection was carried out to identify individual DDC numbers with the highest volume of loans within the last two years. This provided a set of subject areas for PDA selection, which was critically reviewed by the Collections Team in conjunction with Academic Liaison Librarians who provided guidance on relevant additional topics which may be missing; for example, areas where there is little current stock and so liable not to feature in circulation reports. The list was then refined and broadened before being used to select a range of electronic books, which were added to the library catalogue in April 2018.

While a comprehensive review of the print journal collection was also undertaken, this required manual intervention as the collection has always been restricted for reference use with no circulation data available. As part of the project, existing print subscriptions were transferred to online format where available, which will improve remote access to content and allow usage data to be collected for future assessment.

Results

Print Collection

Following the review, 32,750 books were retained and moved to the new library, and 5,000 books considered to be of research value were archived to University storage. The remainder of the legacy collections were withdrawn, with the deselected material primarily consisting of outdated and superseded editions of textbooks. As a result, the average (mean) age of the print book collection has reduced from over 25 years to under 10 years (Figure 4), and demand for books within the collection has increased from an average (mean) of less than 3 loans per item to 7 (Figure 5).
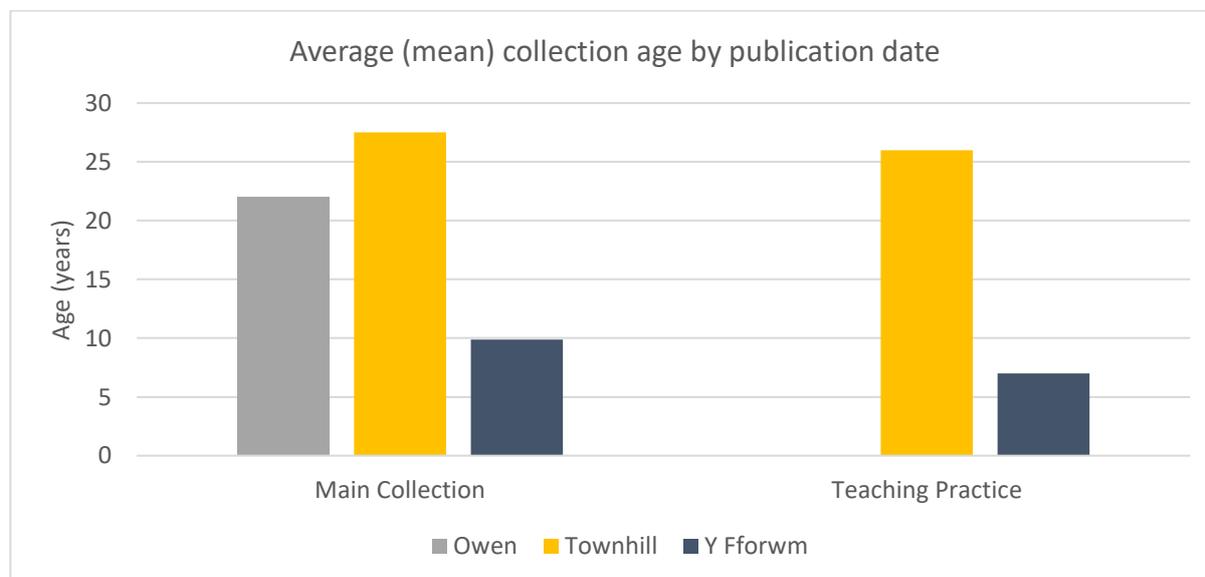
Figure 4: Average (mean) collection age for the legacy Owen and Townhill libraries, and for Y Fforwm
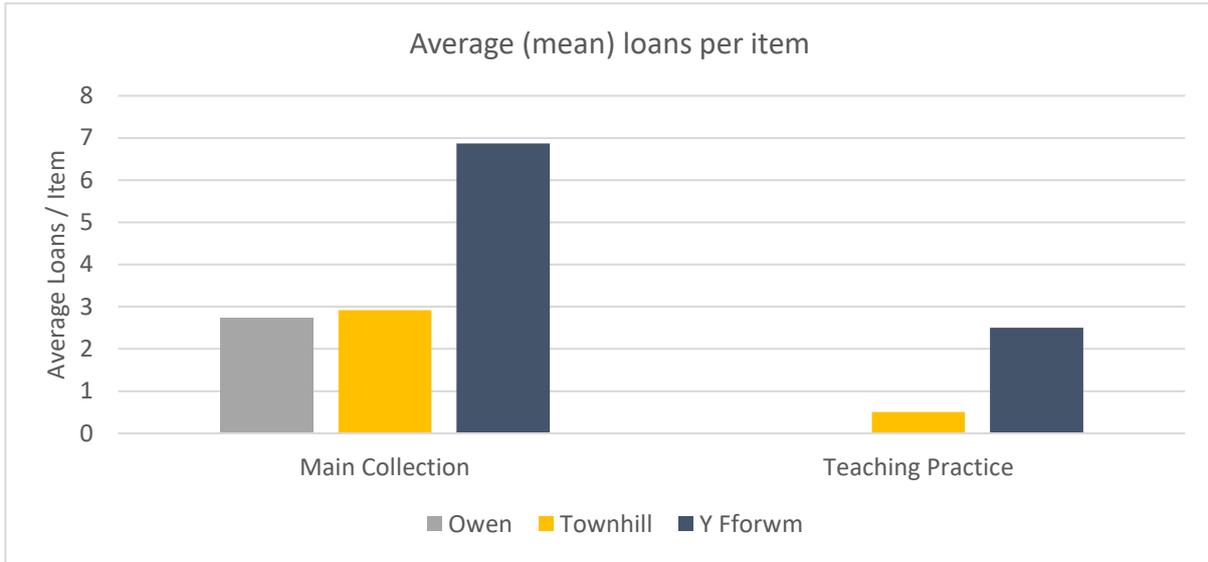
Figure 5: Average loans per item pre-review in the Owen and Townhill libraries, and for the remaining collection in Y Fforwm after completion of the work

In the first 10 month period following opening, despite the reduction in collection size, the number of print loans in Y Fforwm increased by 35% over the same period in the previous year at the Owen and Townhill libraries; this compares to an average decrease in loans of 6% at other UWTSD campus libraries (Figure 6). An increase in the number of visitors, from 46,705 between August 2017 and June 2018 at the two legacy libraries combined, to 99,065 between August 2018 and June 2019 at the new library, was also recorded. Y Fforwm includes academic teaching space, which was not included within the legacy buildings, and students attending lectures will therefore account for a significant proportion of this increase.

Of the items changed from reference only status to be loanable as part of the new circulation policy, 1807 (37%) were borrowed during the period August 2018 to June 2019.
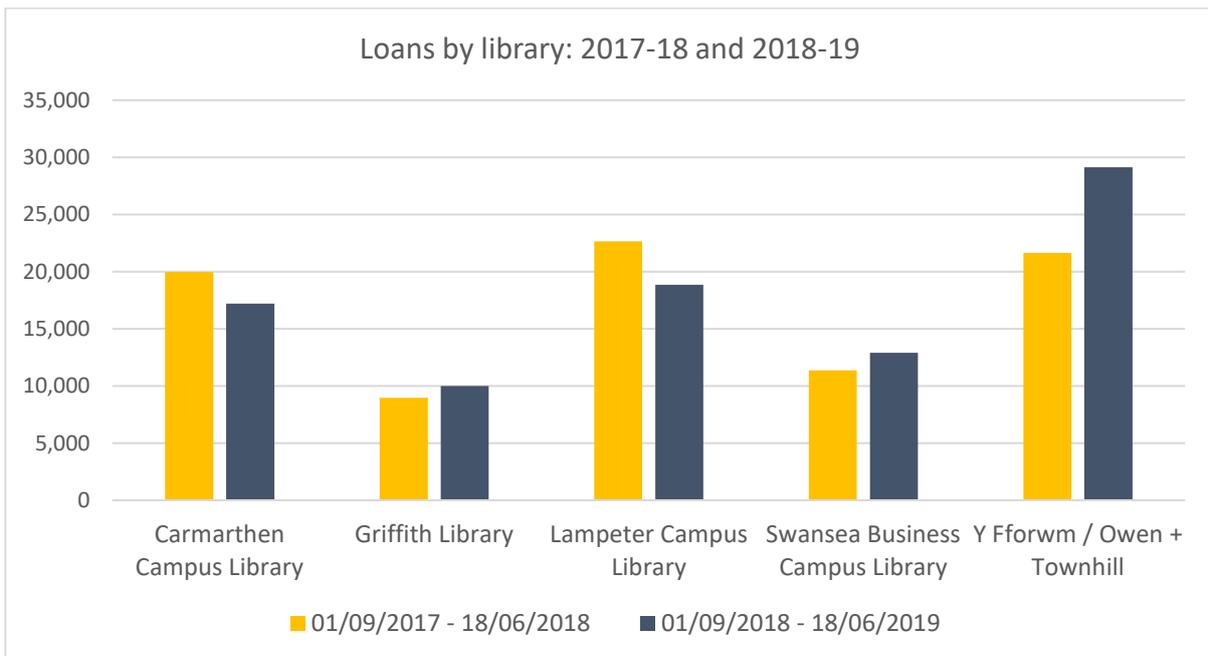
Figure 6: Loans by library for the period 1st September to 18th June, 2017-18 and 2018-19

Electronic collection

A range of approximately 50,000 PDA titles were selected by DDC class number, price, language, publication date and reading level, and made available between 6th April and 29th May 2018. Although PDA content published from 2000 onwards was loaded to the library catalogue, most titles accessed were published between 2014 and 2017 (Figure 7), and 77% date from 2010 and later. This compares to the legacy print collections held in Owen and Townhill libraries, the majority of which were published before 2003, illustrating the demand for up-to-date content that PDA has successfully delivered. These figures exclude access to PDA titles for less than five minutes, which was considered a 'preview' and therefore not charged.

Further analysis of the titles purchased through this PDA project for the period August 2018 to June 2019 using the COUNTER Book Report 2 (revision 4) standard shows an average (mean) of 260 section requests per title. This compares to 67 section requests per title for those purchased from the same supplier in the 2017-18 academic year outside of the PDA project for the same period.
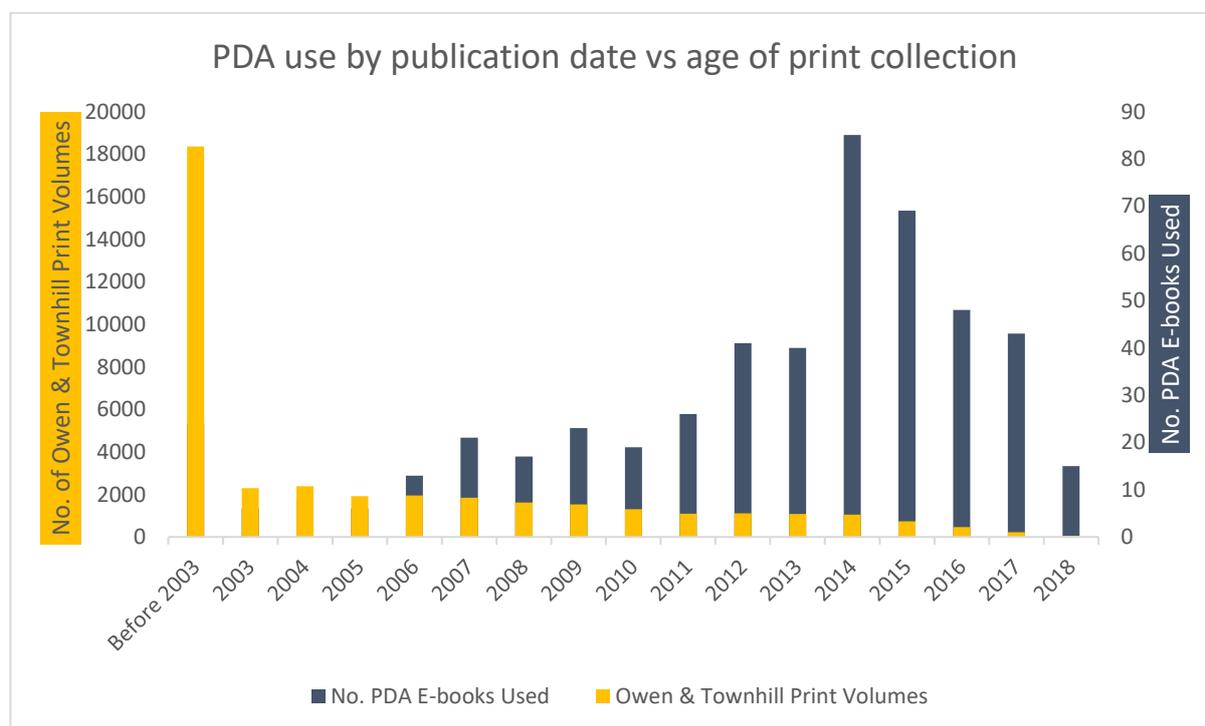
Figure 7: PDA use by publication date compared to age of existing print holdings

Discussion

The new library is very different in nature to its legacy counterparts. The changed function and more attractive environment of the library building itself may act as a driver for increasing use of the print collection. Changes in loan policy also make it difficult to compare circulation figures on a 'like for like' basis.

As the collections have an undergraduate, rather than research, focus and the University's rare books are held in the Special Collections and Archives at Lampeter Campus, LLR could not justify a subscription to a collection benchmarking service such as OCLC Greenglass. During the project, LLR did not have access to Copac Collection Management Tools, however are now participating in the Jisc National Bibliographic Knowledgebase and will be able to use CCM Tools and the forthcoming Jisc Library Hub Compare service for future collection benchmarking and assessment. The University did not have reading list management software at the time of the project, and has since implemented Ex Libris Leganto. Reading list data will provide a valuable additional component to future collection assessment.

At the time of writing, Y Fforwm has only been open for ten months, and further analysis will need to be conducted in the coming years to ensure that the initial benefits continue to be replicated. Continued management and investment in the collection will also be key to maintaining a library fit for purpose in the digital age.

Conclusion

The successful outcome of the project has demonstrated the value of both a data-driven approach to collection management and a consistent policy framework. Providing a better quality, smaller core print collection has not led to a reduction in usage; instead, there is evidence that usage has increased, however this is set in the context of changing loan policy and a new and more attractive library space.

The exercise was a valuable learning curve in collection data analysis and LLR are now conducting a thorough review of bibliographic metadata with a view to capturing improved analytics for future performance measurement.
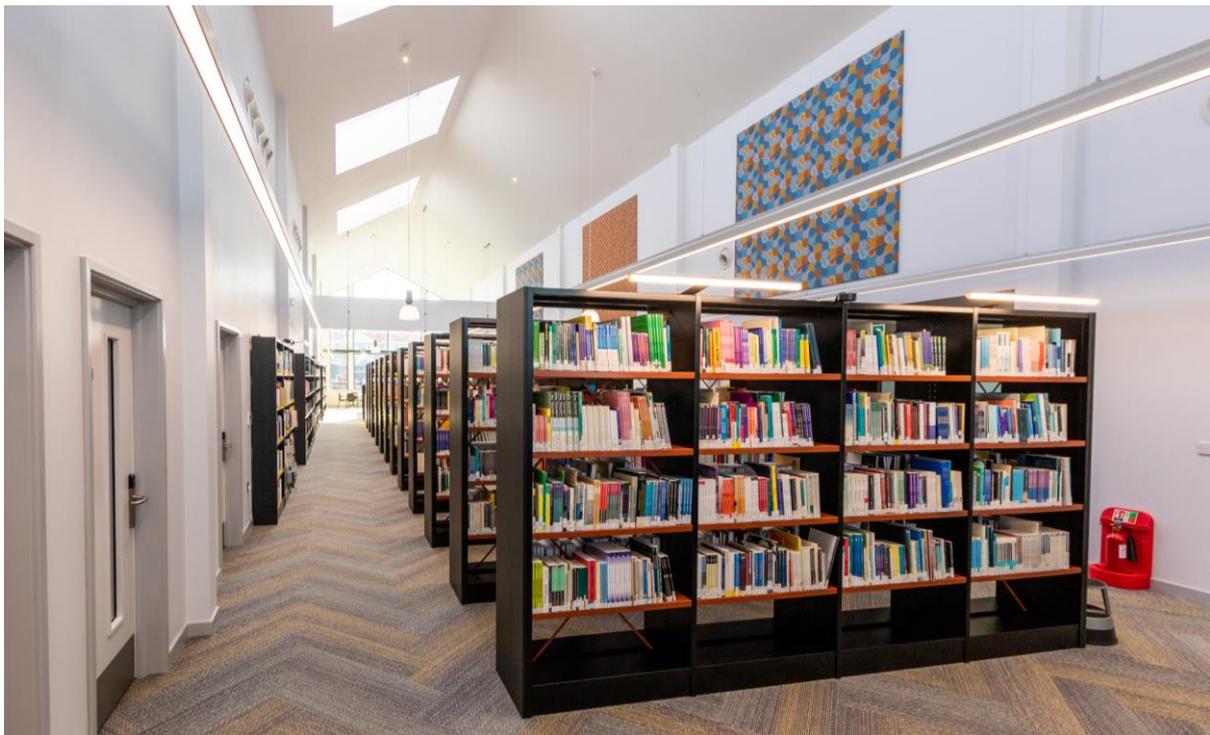
Figure 8: The collection in the new library, September 2018.

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Examining the Pedagogical Practices of Business Faculty

A Qualitative Analysis to Inform Library Support

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Abstract

Purpose
During the 2018-2019 academic year, the Murray State University Libraries conducted a study to examine the teaching practices of business instructors who teach at the undergraduate level at Murray State University. The study was part of a larger suite of parallel studies of business instructors at higher education institutions in the United States and was coordinated by Ithaka S+R, a non-profit organization that provides research and strategic guidance to help libraries navigate economic and technological change.

The goal of the study is to understand business instructors' undergraduate teaching processes using qualitative data. This data will serve as a performance measurement so that existing resources and services can be evaluated and so that resources and services may be developed by the University Libraries to support these instructors in their work.

Research Methods
Through semi-structured interviews with 14 business faculty, we explored how academic libraries may support the learning outcomes of students through their business curricula, and also how academic libraries' information literacy instruction, technological offerings and support, and spaces play an important role in those learning outcomes as well. We selected qualitative methods for this study to explore how faculty perceive their teaching and its relationship to supports provided by the university libraries.

The number of interviews for the sample was informed by Guest, Bunce and Johnson's research demonstrating that data saturation can be achieved at the point of approximately 12 qualitative interviews and Creswell's argument that a range of 15 to 20 interviews be conducted when utilizing a grounded theory approach to qualitative analysis. The transcribed interviews were analyzed using grounded theory methodology, as per Strauss and Corbin. As such, no pre-existing codes were used, but rather, we developed a coding structure in the process of reading through the data. Attention during coding and analysis was focused on what the informants identified as their teaching support needs towards developing ideas for improving library services.

Findings, Implications, and Recommendations
There are a number of implications and recommendations drawn from the findings. The selection, revision, cost, and availability of textbooks was a popular topic, which poses interesting implications for academic libraries. A second theme that emerged was the role of technology, which impacts the teaching dynamic in many capacities. First, it changes the dynamic of the faculty/student relationship, in that students may find themselves instructing their faculty of the capabilities of new technologies. They also discussed technology as an instructional support, but also as a source of distraction with increased informational white noise. The third theme that emerged was a discussion of motivation and support for both faculty and students. Faculty in business, as with faculty in other disciplines, are still faced with the timeless conundrum of how to use extrinsic means (such as grades or other rewards) to develop intrinsic motivation to learn. At the same time, participants discussed struggling with their own motivation to learn new instructional techniques, or to continue to seek out new supplemental course resources. Throughout discussions of these topics, participants in the study explicitly or implicitly described their desire to improve as teachers, improve the student experience, and better prepare students for the challenges they will face in their lives and careers. However, they feel limited with time available to them, given competing priorities of their faculty roles in a dynamic information landscape.

Our recommendations for academic libraries following this study involves greater intentionality for:

--positioning subject librarians to research and provide suggestions for resources that may serve as textbooks or other supplemental course materials,
--crafting informational messages, both about resource availability and instructional improvement programming, to individuals who are already receiving an overwhelming number of similar messages,

--partnering with instructional technology and pedagogy support units, wherever possible,
--and collecting and preserving case studies as an informational format.

A full list of recommendations from this study will be available in the presentation and subsequent publications.

Conclusions
Due to the goal of the project to elicit results that can be used to inform and improve library services at Murray State University, the project is designed to be exploratory, small-scale and grounded in approach. This study does not purport be statistically representative nor are the recommendations meant to be prescriptive; rather, the report and its recommendations are intended to be suggestive of areas for further investigation. The participants shared their perspectives on teaching coming from a range of experience from a few years to a few decades. From the stories they shared about their teaching and the ways in which they have sought or utilized institutional supports, a number of commonalities emerged. Moving forward, University Libraries at Murray State University has an enhanced understanding of the unique needs of this subject area to utilize for outreach to faculty in business and related disciplines. Overall, the findings of this study demonstrate that faculty want to be good teachers and engage in opportunities to improve their teaching.

Originality and value of the proposal
For over five years, Ithaka S+R has successfully developed large-scale research projects through its Research Support Services program to study the research support needs of scholars in various disciplines. This study is part of a companion program to understand the pedagogical support needs of faculty and is the first project in the series. Ithaka S+R will coordinate a final report by reviewing the local reports from the participating institutions and develop a public capstone report identifying recommendations for relevant stakeholders to be released in late 2019.

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Exploring the connection between use of Libraries and student outcomes: A closer look at demographic factors

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Introduction

Recent years saw an increase in scholarly, administrative, and critical attention to the collection and use of data about students' interactions with college libraries. Using the data holds the potential to support students in their academic and personal journeys and help them navigate their educational environments. The connection between the use of libraries and student success outcomes has been investigated in several distinct strands of literature. Soria, Fransen and Nackerud (2014) explore the correlations between using the libraries and academic retention for first year students, finding that four specific types of interactions had the strongest connections: database logins, book loans or renewals, electronic journal logins, and use of workstations (p.88). Similarly, Haddow (2013) finds that students with higher levels of library usage also have higher retention rates. Haddow extends the analysis to include some socio-economic variables, such as age and socioeconomic status as measured by the students' zip code. Continuing the study of factors related to the retention of first year students, Soria, Nackerud and Peterson (2015) look at a variety of variables, ranging from parental income to living arrangements. In a follow-up study, Soria and Fransen (2017) explore the connection between library use and retention of a cohort of students, finding that students who used the libraries were more likely to graduate within four years. This body of research demonstrates the relationship between student success, as measured by grade point average and retention/graduation, and the use of libraries. However, some of the recent scholarship (e.g. Jones and Salo, 2018; Asher, 2017) raises concerns about whether learning analytics project meet the ethical standards of the libraries profession, while Robertshaw and Asher (2019) critique learning analytics studies for not meeting the beneficence standard of research because effect sizes of the correlations are too small. These critiques raise important considerations, but overlook two significant aspects. First, most of the studies report effect sizes on general correlations for the use of libraries resources by the entire student body. We know, however, that college experience is greatly impacted by socio-economic and demographic factors, so while the effect size for the entire student body may be small or moderate, it may be higher for specific populations. Second, a small effect size can still be meaningful, and it is particularly true in education where a tiny difference in the term GPA might mean the difference between graduating and having to complete another set of courses, paying or borrowing thousands of dollars. Thus, the goal of this project is to take a closer look at demographic factors that might be related to students' experience and see how students from different backgrounds interact with the libraries. It is an exploratory case study that does not set out to provide a definitive response to this question, but rather aims to complicate the conversation and present a more nuanced picture.

Methods

The project is a case study (Patton, 2002), using quantitative analysis methods. For this project we used data previously collected in 2015-2016 for service purposes and as part of previous research (e.g. Soria *et al.*, 2017), limiting it to specific variables (see Table 1).

Table 1. Sample of demographic and student experience variables

Variable	Description

Term GPA	Students' GPA for Fall 2015
Cumulative GPA	Students' GPA from the semester they started through Fall 2015
College	College the students were enrolled in
Basic Status	Students' status (i.e. first year, professional etc)
Detailed Status	Students' academic status split by semester and year (i.e. freshman 1st semester, professional student 2nd year etc)
Gender	Students' gender reported as Male/Female/Unknown
Ethnicity	Students' ethnic background
Age	Students' age split into the following levels: Under 18, 19-20, 21-24, 25-34, 35+, unknown.

For the use of Libraries we looked at whether the students interacted with library instruction, reference services, digital resources, course reserves, and circulation, as well as two meta-variables, marking the use of any resources and interventions (instruction and reference).

These data carry with them specific bias inherent to the data collection process. First of all, the data on student background were taken from the institutional repository, and they do not show the full, nuanced picture of students' identity. Second, some of the Libraries data carry assumptions; for example, course instruction data assumes that a student enrolled in a class was present for the Libraries session.

In the first stage of the project we created subsets for every level of each demographic and identity variable and ran ANOVA models, looking at correlations between interactions with the libraries and the GPA, i.e. there were 14 ANOVA models for each subset: seven looking at the cumulative GPA and seven looking at the term GPA. In analysing the ANOVA models we looked at p-values first to determine whether the connection was statistically significant, and then used Cohen's f (Salkind, 2010b), Cohen's d (Salkind, 2010a), and adjusted R-squared (Bar-Gera, 2017) to estimate the effect size and strength of relationship between predictors and the independent variable. The analyses were run on three versions of the dataset. First, we used the dataset excluding missing values in the students' GPA and then repeated the analyses treating missing values as 0 for the cumulative and term GPA respectively.

Table 2. Relative measure of effect size

	Cohen's d	Cohen's f
Small	0.2-0.5	0.1-0.25
Medium	0.5-0.8	0.25-0.4
Large	>0.8	>0.4

Data

Looking at the subset with missing values treated as zero, we found 301 models with at least small effect size in the relationship between student background and the use of library resources. Likewise, we found 116 models connecting the

cumulative GPA and use of library resources with excluded missing values, and 114 models for the term GPA and use of library resources with excluded missing values. Below we discuss 10 models with the strongest effect sizes for connections with specific populations for each of the datasets.

In the dataset treating missing values as zero, we found that the term GPA is more strongly connected with the use of Libraries resources (see Table 3). In this set we report only one model related to graduate students, because this group is defined through three variables: basic status as graduate student, detailed status as graduate student, and being enrolled in graduate school. All models show comparable effect sizes and adjusted R-squared. The dataset shows three types of variables associated with strong relationships between the GPA and the use of libraries. First, it is specific colleges, particularly, the College of Allied Health. As we will show below, this college comes up in all datasets as having very high effect size in the models for the connection between the GPA and the use of Libraries. Second, it seems that post-baccalaureate students have tighter connections between grades and Libraries use. Finally, non-traditional students, i.e. students who were over 35 years of age at the time, seem to have higher level of correlation between grades and the use of Libraries. Finally, for students whose ethnicity was marked as "unknown," the use of course reserves explained 6.5% of overall variance. In terms of the type of use, course reserves definitely have the strongest relationship with the GPA, followed by the use of digital resources, and resources in general.

Table 3. Relationships between GPA and use of library resources treating missing values as 0

Population subset	Use of library resource	Cohen's f/Cohen's d	Adjusted R-squared
College of Allied Health*	Course reserves	0.64/1.28	0.289
Graduate students	Course reserves	0.36/0.72	0.116
Fellows	Course reserves	0.35/0.7	0.112
Students age 35+	Course reserves	0.34/0.68	0.106
Masters students	Digital resources	0.28/0.56	0.07
Masters students	Resources	0.28/0.56	0.07
Professional students (year 4)	Digital resources	0.26/0.52	0.65
Unknown ethnicity	Course reserves	0.26/0.52	0.065
Professional students (year 4)	Resources	0.26/0.52	0.063
School of public affairs	Course reserves	0.25/0.5	0.06

*cumulative GPA

In the next dataset, we looked specifically at the cumulative GPA, excluding missing values (see Table 4). Within these parameters, course reserves again showed up in most models, followed by digital resources, circulation, and resources overall. In terms of student background factors, College of Allied Health and College of Liberal Arts had strong correlations between cumulative the GPA and the use of Libraries. This dataset also shows relationships between grades and the use of libraries for three groups of minority students: Hispanic, Hawaiian, and American Indian.

Table 4 Relationships between the Cumulative GPA and the use of library resources excluding missing values

Population subset	Use of library resource	Cohen's f/Cohen's d	Adjusted R-squared
College of Allied Health	Course reserves	0.68/1.36	0.32
Ethnicity Hawaiian	Digital resources	0.25/0.5	0.06
College of Allied Health	Digital resources	0.24/0.48	0.05
Ethnicity Hawaiian	Resources	0.24/0.48	0.05
College of Allied Health	Resources	0.23/0.46	0.05
College of Liberal Arts	Circulation	0.22/0.44	0.04
Ethnicity Hispanic	Digital resources	0.21/0.42	0.04
Ethnicity Hispanic	Resources	0.21/0.42	0.04
Ethnicity unknown	Digital resources	0.19/0.38	0.03
Ethnicity American Indian	Resources	0.19/0.38	0.03

The final dataset explores the relationship between term GPA and the libraries use, while excluding missing values (see Table 5). Here we can see the same trends as we in the previous datasets, but with some important changes. First, medical and law schools join the College of Allied Health in having connections between grades and students' use of Libraries. We

also show that students who identify as Hawaiian and Hispanic have stronger relationships between their GPA and use of library resources. However, this is the first dataset in which librarian-led section of first-year experience course comes up as an important subset.

Table 5 Relationships between the Term GPA and the use of library resources excluding missing values

Population subset	Use of library resource	Cohen's f/Cohen's d	Adjusted R-squared
College of Allied Health	Course reserves	0.78/1.56	0.38
Ethnicity Hawaiian	Digital resources	0.24/0.48	0.05
Ethnicity Hawaiian	Resources	0.23/0.48	0.05
Ethnicity Hispanic	Resources	0.2/0.4	0.04
Ethnicity Hispanic	Digital resources	0.2/0.4	0.04
Medical school	Digital resources	0.21/0.42	0.04
Medical school	Resources	0.21/0.42	0.04
College of Allied Health	Circulation	0.2/0.4	0.03
CSE 1001 (led by librarian A.)	Reference	0.22/0.44	0.03
Law School	Digital resources	0.18/0.36	0.03

Discussion

The results of this preliminary research project show a clear connection between the use of course reserves and students' academic success, as measured by their GPA. Course reserves showed up as an important factor in models focused on a range of population subgroups, from students enrolled in a particular college to ethnic minorities. These models are correlational and do not establish causation, so it is entirely possible that a different variable impacts both use of reserves and grades. However, this connection still needs further exploration to fully understand the interaction or establish its absence. Course reserves could support students by being more affordable than traditional textbooks or, perhaps, by having increased proximity through being more integrated in the students' learning environment. This question requires follow-up qualitative work, perhaps using ethnographic methods to explore the ways in which students interact with the resources.

The data seem to indicate that specific colleges create environments that support stronger relationships between student success and use of library resources. For example, the College of Allied Health had much larger effect size and adjusted R-squared measures in all three models. The College of Allied Health houses an undergraduate program in Medical Laboratory Science and graduate programs in Occupational Therapy. The strong relationships between the use of reserves and grades within this college might be due to the issue of access. It is a college with higher proportion of non-traditional students. For example, almost half of the students enrolled are in the 25-34 and 35+ age groups. Perhaps these students benefit more from having more affordable course content options. It is also possible that the faculty structure their courses in these programs differently, relying more on library resources, and thus contributing to the correlations we observe. Alternatively, students in these programs might present a sufficiently different sample, leading the drastically different model results. This cluster of observations calls for further investigation of the practices within the college, such as analysing course syllabi and sites on the learning management system and interviewing the faculty to explore their practices.

One of the surprising findings of this project was the absence of instruction and intervention in the models with the strongest relationships to student grades. This can be explained through two primary lenses. First, it is possible that this is the impact of data structure: not all instructional sessions are entered accurately, and larger than average segments of data might be missing. It is also plausible that these factors are less strongly correlated with student success, as they do show up in the models, but have effect sizes below 0.2 (Cohen's f). The dataset with missing values treated as zero included 29 models with instruction and 32 with intervention. This makes it even more important to look closely at the only intervention model that showed a sufficiently high effect size, i.e. the model with students in a first year experience course taught by a librarian. The data included four subsets: students who did not take this course, students who took this course with a non-librarian instructor, students who took it with librarian A, and students who took it with librarian B. Both librarians are experienced professionals and follow the same general curriculum. Yet only one of the sections showed using reference services as a factor connected with term GPA. This calls for future qualitative work to identify instructional practices that may be making a difference in this course.

This project has practical significance beyond contributing to the growing body of scholarship on connecting library data and student success. As it helps us to identify which groups have the strongest relationships between grades and library use, we can provide targeted outreach and create additional programs to reach the students. We can also develop a more nuanced understanding of who the students who do not use the libraries are and reach out to them in more focused ways.

Conclusion

This project offers preliminary findings and points to the need for further exploring the connection between student success as measured by their GPA and the use of libraries. Specifically, it demonstrates the need for follow-up quantitative work with more complex models using multiple demographic and identity factors, as well as qualitative work to improve our understanding of how the interactions with the library might connect with other aspects of the students' college experience.

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From Measurement and Evaluation to Data Analytics:

Changes in Curriculum to Prepare Library Professionals

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Introduction

In North America the American Library Association (ALA) Committee on Accreditation accredits graduate programs of library and information studies leading to a master's degree, identifying those programs meeting the *Standards for Accreditation of Master's Programs in Library and Information Studies* (American Library Association, 2019b). The Introduction to these *Standards* notes: "The Standards stress innovation, and encourage programs to take an active role in and concern for future developments and growth in the field" (p. 3). Standard II.4 specifies that: "Design of general and specialized curricula takes into account the statements of knowledge and competencies developed by relevant professional organizations" (p. 5). In 2017 the Association of College and Research Libraries issued the *ACRL Proficiencies for Assessment Librarians and Coordinators* (Association of College and Research Libraries, 2017) outlining needed proficiencies in 11 broad categories: knowledge of assessment in libraries and higher education; ethics; assessment methods & strategies; research design; data collection & analysis; communication & reporting; advocacy & marketing; collaboration & partnerships; leadership; management; and mentoring, training, & coaching. Two of the contributors to the development of the *ACRL Proficiencies* suggest that "in addition to providing a framework for reflection and analysis of existing course content, the [*Proficiencies*] could be employed to develop existing courses, design new offerings, or integrate assessment throughout entire programs" (Emmons and Oakleaf, 2016, p. 624). This paper examines the library and information studies (LIS) programs accredited by the American Library Association in order to determine the extent to which these programs are innovating to address the *ACRL Proficiencies* through development of courses and specializations. While at least some programs have had relevant courses for almost fifty years (e.g., at the University of Illinois at Urbana-Champaign Professor F. W. Lancaster introduced a course on Measurement and Evaluation of Library Services in 1970), the extent to which these programs have taken into account the emergence of advanced tools and techniques for data analytics has not yet been investigated.

Institutional Contexts

As noted by Parry (2018), in higher education there is an increasingly crowded data science education landscape, especially at the graduate level. He cautions that "the label 'data science' encompasses a wide variety of new programs—a landscape that can be confusing for students to navigate." Two recent studies have sought to explore this data-centric education landscape as it relates to library and information science. Kim (2016) looked at programs accredited by the American Library Association, considering data curation as well as data analytics. He noted that such programs were most commonly offered by iSchools, though some LIS programs that were not iSchools also had some offerings. Ortiz-Repiso *et al.* (2018) focused only on iSchools, but with an international scope. They found that data-related curriculum change was taking place in the iSchools, ranging from new data-related course offerings to implementation of data-focused degree programs and certificates. The present study updates both of these, focusing only on institutions with ALA-accredited programs with an emphasis on identifying offerings related to data analytics.

Among ALA-accredited programs as well as internationally, LIS programs are increasingly being partnered with other subjects to create larger academic units within a university. As noted by Goulding *et al.* (2018), such groupings can impact both the LIS curricula and research as faculty are brought into interdisciplinary relationships with other faculty in the same

school or college. Compared to forced mergers of LIS with other units such as Business or Education, the development of iSchools (Dillon, 2012) represents a more purposeful expansion from an "agency-based orientation with its emphasis on the library, archive, or collection-owning organization towards a more contextual analysis of information use in the lives of people, organizations and cultures" (p. 272). Other characteristics of iSchools typically include an emphasis on technological and computational infrastructures as well as faculty from a variety of disciplines who share an interest in information. The present study considers the organizational home of the data-related curricula to see if the dominance of iSchools observed by Kim continues.

Methodology

Sixty-one higher education institutions in the United States and Canada offer programs accredited by the American Library Association (American Library Association, 2019a). Websites for each program were analysed to identify the extent to which they offer courses and specializations relevant to the preparation of assessment librarians, with a particular focus on developing expertise in data analytics, including data collection & analysis and communication & reporting (categories 5 and 6 in the *ACRL Proficiencies*; see Appendix A). Data collection was limited to the information available on the public-facing websites of accredited programs, which generally included course titles and brief course descriptions but not full course syllabi. On each website, information about any of three types of offerings was gathered: 1) designated concentrations, specializations, tracks, or career pathways within degree programs; 2) separate certificate programs, typically a specified set of courses more limited in scope than a degree program; 3) full degree programs with a data analytics focus. The iSchools organization directory (iSchools Inc., 2019) was consulted to determine the membership category for each institution. There are six categories, reflecting a graduated annual dues structure: iCaucus ($5000), Enabling ($4000), Sustaining ($3000), Supporting ($2000), Basic ($1000), and Associate ($300). The Associate category is for schools that may not meet requirements for other levels.

Findings

The three types of offerings—pathways, certificates, and degrees—are considered in turn, highlighting the features of each program identified. Some institutions have offerings of each type, while others focus on only one.

Concentrations/Specializations//Tracks/Pathways
Whether designated a concentration, specialization, track, or pathway, these offerings have in common being embedded within a degree program. In this section the term "pathways" is used regardless of the term used by each institution. Pathways offer guidance to students on course selection, typically through a combination of some required courses and a choice of electives. Only the University of Tennessee School of Information Sciences defines a career pathway for assessment librarianship (Fleming-May *et al.,* 2017). The description of this pathway explains that assessment librarians "regularly generate, collect, and analyse quantitative and qualitative data, and develop channels and products to share that data with internal and external audiences" (School of Information Sciences, 2019). The remaining pathway offerings identified as part of this study are explicitly data-related (see Appendix B).

A detailed analysis and comparison of courses associated with each of these pathways is beyond the scope of this paper, but some overall patterns can be discerned through an examination of the entries in Appendix B. The starting point for data collection was the list of 61 institutions with programs accredited by the American Library Association (2019a). Appendix B includes 24 pathways from 21 institutions, meaning that 40 institutions with accredited programs have not yet identified a data-focused pathway for students pursuing a library and information studies degree. While such programs may offer some relevant courses, they are not being foregrounded as a potential area of focus for students.

Twenty of the twenty-one institutions (Catholic University is the exception) are iSchools organization members, with 15 at the highest (iCaucus) level of membership, 3 Basic, and 2 Associate. While all these pathways are offered by institutions with ALA-accredited programs, the pathways are not necessarily associated with those programs because iSchools often offer multiple master's level degrees.   Of the 24 pathways, 17 are associated with ALA-accredited programs, while 7 (Arizona, Illinois MS/IM, Maryland, Pittsburgh, Washington, Wayne State, Wisconsin-Milwaukee) are associated with other

MS degrees offered by the iSchool where the ALA-accredited program is housed. Nevertheless, LIS students often have freedom to take a wide range of electives. Even if such students do not have the option of pursuing a data-focused pathway, they still could choose from the data-related courses available. Illinois and Indiana have defined a data-related pathway for both MS degrees offered by the iSchool, whereas Kent State has specified two different pathways (applied data science and data analytics) for its Master of Library & Information Science degree.

Titles of the pathways emphasize data analytics, data science, or data management. Exceptions are the University of British Columbia's data services (encompassing data stewardship and data analysis), Pratt Institute's research and data (managing data and supporting researchers in their use of data, including analysis, visualization, and interpretation), Syracuse University's data librarianship, and University of Toronto's human centred data science (starting in fall 2019). The last-named pathway has been designed to give graduates the skills and knowledge to deal with complex, large-scale data sets and information systems as well as user-centred visualization, ethics, and policy.

Certificates

Certificates provide a mechanism for developing expertise through enrolling in a specified set of courses, typically 50% or less of the credit required to earn a full degree. They are especially attractive to individuals seeking continuing professional development. The content of these offerings is explored in some depth to determine to what extent they could offer a means for working librarians to develop the proficiencies outlined for categories 5 & 6. Six certificates were identified (see Appendix C) with a range of names: data analytics for decision making (Wisconsin-Madison), data analytics (Oklahoma), big data analytics (Pittsburgh), data science (Indiana, Syracuse), and applied data science (Drexel). The number of courses to be completed in order to earn the certificate ranges from 3 (Wisconsin-Madison) to 5 (Drexel, Pittsburgh, Syracuse), with two requiring 4 (Indiana, Oklahoma). All of the institutions offering certificates are iSchools organization members, four at the iCaucus level (Drexel, Indiana, Pittsburgh, Syracuse), one at the basic level (Wisconsin-Madison), and one at the associate level (Oklahoma).

A brief profile of each certificate program follows:

Capstone Certificate in Data Analytics for Decision Making. University of Wisconsin-Madison
Prerequisites: designed for working professionals; no prior coursework in statistics, research methods, or computer science required
Courses:
Required: Introductory Analytics for Decision Making; Data Mining, Planning, and Management; Data Visualization and Communication for Decision Making

Graduate Certificate in Data Analytics. University of Oklahoma
Prerequisites: does not require a computer science background
Courses:
Required: Introduction to Data Analytics; Introduction to Data Mining for Information Professionals
Electives (choose 2): Database Design for Information Organizations; Information and Communication Technology; Introduction to Information Visualization; Information Retrieval and Text Mining

Certificate of Advanced Study in Big Data Analytics. University of Pittsburgh
Prerequisites: prior coursework in a structured programming language, statistics, and mathematics
Courses:
Required: 3 of the following: Data Mining; Algorithm Design; Advanced Topics in Database Management; Data Analytics
Electives: 2 of the following: Decision Analysis and Decision Support Systems; Information Storage and Retrieval; Introduction to Neural Networks; Social Computing; Geospatial Information Systems; Mobile GIS and Location-Based Services; Advanced Geospatial Information Systems; Network Science and Analysis; Information Visualization

Graduate Certificate in Data Science. Indiana University
Prerequisites: basic understanding of programming languages Python and R, math, and probability

Courses:

Electives: any 4 courses from the MS in Data Science program in which courses span: Machine Learning, Data Mining, Text Mining; Data Engineering and Stewardship; Visualization and Storytelling

Certificate of Advanced Study in Data Science. Syracuse University

Prerequisites: recommended that students have a strong background in science, statistics, research, and/or information technology

Courses:

Required: Data Administration Concepts and Database Management; Introduction to Data Science

Electives: 3 of the following: Technologies in Web Content Management; Enterprise Technologies; Managing Information Systems Projects; Information Systems Analysis; Basics of Information Retrieval Systems; Natural Language Processing; Foundations of Digital Data; Creating, Managing, and Preserving Digital Assets; Metadata; Data Analytics; Big Data Analytics; Information Visualization; Data Warehouse; Text Mining; Advanced Database Administration Concepts and Database Management; Research Methods in Information Science and Technology; Statistical Methods in Information Science and Technology

Post-Baccalaureate Certificate in Applied Data Science. Drexel University

Prerequisites: those without a prior degree in computer science, software engineering, or math (plus programming) may have to take additional prerequisites before pursuing advanced courses

Courses:

Required: Data Acquisition and Pre-Processing; Data Analysis and Interpretation

Electives: 3 of the following: Organization of Data and Information; Data and Digital Stewardship; Social Network Analytics; Information Retrieval Systems; Information Visualization; Data Mining; Introduction to Data Analytics

Reviewing these profiles, it is evident that the intended audience differs. Certificates offered by Wisconsin-Madison and Oklahoma could be pursued by students or working professionals with a range of backgrounds, while the other four presuppose more extensive prior preparation. Course titles indicate that all would provide opportunities to learn about data analytics and visualization, consistent with the expectations of the *ACRL Proficiencies*.

Degrees

Eight iSchools offer data-focused degrees, distinct from the ALA-accredited degrees: four in Data Science, three in Applied Data Science, and one in Data Analytics and Visualization. As shown in Appendix D, these require completion of 30-36 semester hours of credit. The Syracuse University Applied Data Science degree is offered by the iSchool in collaboration with the Whitman School of Management. In the case of the MS in Data Science at Washington, six schools and departments were involved in its design: Applied Mathematics, Biostatistics, Computer Science & Engineering, Human-centered Design and Engineering, the iSchool, and Statistics. For the Pratt Institute MS in Data Analytics and Visualization degree, core courses are offered by the iSchool, but students are encouraged to identify suitable electives across the institute in departments such as Digital Arts and Graduate Communications Design. This demonstrates that even interdisciplinary iSchools may not have the range of faculty expertise needed to offer a full graduate degree program in data science.

The University of Michigan iSchool's Master of Applied Data Science will launch in fall 2019, in partnership with Coursera. Coursera (2019), which began as a platform offering massive open online courses (MOOCs), now partners with several universities to offer complete graduate degrees in business, computer science and engineering, data science, and public health. This effort to offer graduate degrees at scale has the potential to reduce the cost and improve the accessibility of graduate education.

Conclusion

With a new pathway (human-centred data science at Toronto) and degree (applied data science at Michigan) set to launch in fall 2019, the involvement of iSchools in the provision of data-related offerings, whether pathways, certificates, or degrees, continues to expand. Support for meeting the *ACRL Proficiencies* (see Appendix A) in the categories of Data Collection & Analysis and Communication & Reporting is clearly provided by coursework available through about 1/3 of the institutions

with ALA-accredited degree programs. The development of certificates offers opportunities for those already holding degrees to engage in continuing professional development with a focus on data analytics.

While the analysis presented in this paper does address the question of the extent to which ALA-accredited programs have taken into account the emergence of advanced tools and techniques for data analytics, there is a need for more detailed analysis of course content and anticipated learning outcomes for courses that make up the pathways, certificates, and degrees identified in this study. Additionally, potential sources of continuing professional development beyond those offered for credit by higher education institutions should be explored. For example, can MOOCs, including providers in addition to Coursera, play a role? New credentials continue to be introduced, such as the edX (2019) MicroMasters (a series of graduate-level courses) in Data Science (UC San Diego), Statistics and Data Science (MIT), and Big Data (Adelaide).

Finally, it is important to identify emerging specializations within librarianship beyond assessment librarians that place increasing emphasis on data-related knowledge and skills. Recent job announcements for a research metrics librarian (medical library), manager of data analytics (public library), data and research impact librarian (academic library), data services librarian (college library), and an assessment & analytics librarian (academic library) suggest new opportunities in libraries in the "assessment space". An analysis of such job announcements would inform a more complete picture of the emerging data-related needs and opportunities in libraries and guide further curriculum development in programs seeking to equip graduates to fill them.

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Appendices

Appendix A

Proficiencies 5 & 6 from ACRL Proficiencies for Assessment Librarians and Coordinators (Association of College and Research Libraries, 2017)

5. Data Collection & Analysis

The assessment librarian understands best practices for efficient and sustainable data collection, data management, and data storage. Knowledge of data practices includes documentation of the library's current data practices and steps toward improvement. The assessment librarian:

5.1. Visualizes and implements a roadmap for attaining optimal data collection and reporting processes, including data automation and integration of multiple data sources.

5.2. Utilizes available time-stamped system data, library data, institutional data, and third party data to enable integrated library reporting capabilities and analysis across multiple data sources.

5.3. Identifies and defines metrics and data sets needed to measure assessment outcomes that are considered high priority.

5.4. Ensures accessibility and appropriate distribution of available data to staff and stakeholders.

6. Communication & Reporting

The assessment librarian serves as a catalyst for change within the library by delivering evidence and analysis to fuel better decision making. The assessment librarian:

6.1. Utilizes data visualization tools and techniques with both qualitative and quantitative data to communicate assessment results. Understands the purpose of charts, graphs, and tables and uses them correctly.

6.2. Prepares and formats data for decision-making processes by both internal and external stakeholders. Demystifies basic metrics and statistics for users.

6.3. Writes compelling narratives, creating reports that follow basic graphic design rules and include evidence-based, actionable analysis. Consults with units or departments to frame needs, outcomes, and next steps. Develops well-crafted business cases for stakeholder buy-in.

6.4. Communicates effectively in oral and written communications. Uses multiple channels to communicate results, such as presentations, as well as staff meetings, via email and LibGuides, etc. Regularly "closes loops" with users, reporting 'what you told us' and 'what we're doing about it.'

Appendix B

Concentrations/Specializations//Tracks/Pathways

Each entry indicates the institution, degree name, name of the concentration, specialization, track, or pathway, and category of iSchools organization membership. To locate the full descriptions on institution websites, consult the directory maintained by the American Library Association (2019a).

Albany	MS Information Science	Data analytics	Basic
Arizona	MS Information	Data science	iCaucus
British Columbia	Master of Library and Info. Studies	Data services	iCaucus
Catholic	MS Library and Information Science	Data science	
Illinois	MS Library and Information Science	Data and asset management	iCaucus
Illinois	MS Information Management	Data science and analytics	iCaucus
Indiana	Master of Library Science	Data science	iCaucus
Indiana	Master of Information Science	Data science	iCaucus
Kent State	Master of Library & Info. Sci.	Applied data science	iCaucus
Kent State	Master of Library & Info. Sci.	Data/Information/Technology—Data analytics	iCaucus
Maryland	Master of Information Management	Data analytics	iCaucus
Michigan	MS Information	Data science/Data analytics/Computational social science	iCaucus
North Carolina-Chapel Hill	MS Information Science	Data analysis	iCaucus
Pittsburgh	MS Information Science	Big data analytics	iCaucus
Pratt	MS Library and Information Science	Research and data	Associate
Rutgers	Master of Information	Data science	iCaucus
San Jose State	Master of Library & Info. Sci.	Data science	iCaucus
Syracuse	MS Library and Information Science	Data librarianship	iCaucus
Tennessee	MS Information Sciences	Data curation and data management	iCaucus
Toronto	Master of Information	Human centred data science	Basic
Washington	MS Information Management	Data science	iCaucus
Wayne State	MS Information Management	Data analytics	Associate
Wisconsin-Madison	MA Library and Information Studies	Data/information management & analytics	Basic
Wisconsin-Milwaukee	MS Information Sci. & Tech.	Data science	iCaucus

Appendix C

Certificates

Each entry indicates the institution, name of the certificate, number of courses required for completion, and category of iSchools organization membership. To locate the full descriptions on institution websites, consult the directory maintained by the American Library Association (2019a).

Drexel	Applied data science	5 courses	iCaucus
Indiana	Data science	4 courses	iCaucus
Oklahoma	Data analytics	4 courses	Associate
Pittsburgh	Big data analytics	5 courses	iCaucus
Syracuse	Data science	5 courses	iCaucus
Wisconsin-Madison	Data analytics for decision making	3 courses	Basic

Appendix D

Degrees

Each entry indicates the institution, name of the degree, hours required for degree completion, and category of iSchools organization membership. To locate the full descriptions on institution websites, consult the directory maintained by the American Library Association (2019a).

Drexel	MS Data Science	45 quarter hours (equiv. of 30 semester hours)	iCaucus
Indiana	MS Data Science	30 semester hours	iCaucus
IUPUI	MS Applied Data Science	30 semester hours	Sustaining
Michigan	Master of Applied Data Science	34 semester hours	iCaucus
North Texas	MS Data Science	36 semester hours	Associate
Pratt	MS Data Analytics and Visualization	36 semester hours	Associate
Syracuse	MS Applied Data Science	36 semester hours	iCaucus
Washington	MS Data Science	45 quarter hours (equiv. of 30 semester hours)	iCaucus

How do we actually reach our users?

Case study on the information and communication behaviour of students and scientists at the University of Cologne

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Introduction

As digitisation progresses, both the nature and availability of information and the communication behaviour of library users are changing. Most research is now done online, as users are finding that the information they are seeking seems to be more comprehensive, more up-to-date, and more convenient there. In this context, the question arises as to which media will enable libraries to identify and address the needs of their customers, not only via websites and newsletters but also via social media channels. Library as a place is very popular, as reading rooms are full of students, but there remain many students and scientists who don't avail themselves of all the library resources available to them. Within the framework of two studies, the information and communication behaviour of students and scientists at the University Library of Cologne (USB) at the Institute for Information Science of the TH Köln was examined. This article provides information on the objectives, research design, and results of the two related subprojects. The results show that a systematic process of introducing library services to clients, of establishing ongoing, permanent communication, and developing a more intensive marketing for new and, above all, digital services and products are needed.

Concept and Objectives

Two empirical studies examined the information and communication behaviour of students and scientists at the University Library of Cologne (USB). The first study, conducted by two students working towards their bachelor of library science degrees, dealt with a target group of students of the University of Cologne. The second study, conducted by students pursuing master's degrees, was a project of several months duration for the Market and Media Research course and examined a target group of scientists. Both surveys analyzed information and communication behaviour, along with information needs of both target groups, to derive corresponding recommendations for action to optimize USB customer communications. The key questions were as follows:

● Which communication channels do students and scientists use, and how do they seek information about USB?

● What is the best way for the library to reach students and scientists on the university campus?

● How can the library reach students and scientists in general?

Further sub-questions derived from these key questions:

● What are the requirements of the scientists?

● How do students and scientists use USB and its information and communication channels ?

● What do students and scientists want to be informed about and how do they like to communicate with USB?

● What (additional) services should USB offer to students and scientists?

A similar study conducted at the University Library in Göttingen in 2016 inspired our study. The 2016 study worked with the university administration to produce systemic transformation of the information and communication structures of the library for all target groups, streamlining processes and increasing efficiency (Glitsch, 2016). This project also took place in several stages and - despite major differences between the library structures – served as a partial model for our process.

Research Methods

The study group used partially-structured personal interviews to interview students at five of six faculties of the University of Cologne in October 2018. Four hundred and seventy-seven interviews were conducted at five of the six faculties. The sixth faculty is the faculty of medicine, to which the National Library of Medicine belongs, so those students were not included in the sample. Sixty-seven percent of the participating students were working towards a bachelor's degree, 20% were master's candidates, and 13% took a state examination.

A mixed-method approach was defined for the study on the scientists. In December 2018, guideline-based individual interviews were used to interview scientists from the Faculty of Mathematics and Natural Sciences and the Faculty of Humanities. During the same period, an online survey was conducted in the Faculties of Economics and Social Sciences, Law, and Philosophy. This was done primarily for reasons of easier acquisition (no access to central email distribution lists) and the expectation that a combination of the methods would lead to more reliable results. The aim was to understand the users and their behaviour. The interviews took about 15 to 25 minutes. The individual interviews were audio-recorded. The audio files were listened to several times to document the results and key statements were recorded in writing. These were then transferred to an Excel spreadsheet. Thus, central statements and similarities as well as differences regarding the participants could be worked out.

The online survey was active for 27 days from 5 December to 31 December 2018 (weeks 49-52). The data obtained was stored online on the Unipark tool and then exported to Excel for further processing. The online survey was based on the guidelines designed for the individual interviews, but the questions were adapted to fit the structure of an online form, which differs considerably from a personal interview. The range of topics, however, remained the same to ensure comparability.

The study involved eighty-eight scientists. Fifty-three participants took part in the online survey, and thirty-five participants were interviewed individually. Looking at the participants in the online survey, 54.9% of the respondents held mid-level academic positions. Their average age was 40-49 years, with 45 years the mean value of the group. Professors (22%) and doctoral students (23%) were distributed rather equally. As expected, there was a clear age difference between these groups: professors were on average 50-59 years old, the doctoral students 21-39 years. Research and teaching were the main components of the interviewees' work. Ninety-six percent of the interviewees stated that they were predominantly or partially active in research, while the figure for teaching was 92%.

A similar picture emerges when looking at the demographic characteristics of the participants in the individual interviews. Here, too, more than half of the interviewees came from mid-level academic positions (53%). However, 33% of doctoral students were surveyed, significantly more than professors (13%). One possible reason for this is the limited availability of professors. Altogether, 71% of the participants were younger than 39, exactly 50% of the interviewees were between 30 and 39 years old. The total number of persons surveyed well-represented the distribution in four of the five faculties.

Results – Student target group

The first question for the students *("How did you hear about the University Library (USB) for the first time?")* aimed at discovering the first personal contact or touch point that the students had had with their library. The answer was astonishing, as in all but one faculty, students had heard about the library from fellow students. Only in the faculty of philosophy had students learned about the library from their lecturers. The library's website as a first source was in third place.

The second question *("When did you first visit the library?")* also gave unexpected results. Only about half the students surveyed at the faculty of economic science (46.6%), the faculty of law (46.7%), and the faculty of mathematics and natural sciences (53.1%) stated that they had visited the library at the beginning of their studies. All in all, two-thirds of the students of the faculty of humanities (66.7%) have been early users and, with 71.2%, the faculty of philosophy was the leader in answering this question. All other students stated that they only got to know the library at a later stage, sometimes even towards the end of their studies when they wrote their final thesis. Of the students of the faculty of economic science, 27.7%

had not yet visited the library at the time of the survey. The result is a situation in which the initial contact with the library takes place unsystematically and rather randomly, and later, as opposed to earlier, in the course of studies.

When asked about the frequency with which students use the library's catalogue search, the following picture emerges: 56.5% of the students working towards a bachelor's degree, about 25.5% of in the master's program, and 38.9% of state exam students never use the website for catalogue research. The figures for "once a week" vary: 22.2% for state exam students, 31.1% for master's candidate students and 24.9% for students in the bachelor's program. This shows that bachelor candidate students, in particular, do not know enough about the scope and quality of the catalogue or library collection. Many students in the bachelor degree program search the net freely and are satisfied with it. This is confirmed by the results of a study conducted by the University of Mainz in 2013 on the "Googleisation of information search": "The picture of the mostly rational is unrealistic since most search queries are made with little cognitive effort" [Stark et.al, 2014, 9]. From the library's point of view, use of the catalogue search should and could be significantly higher.

Of course, the library tries different ways to attract attention for its information and services among customers. The third question (*"How do you assess the impact of the following media on yourself?"*) shows, however, that these efforts are partly successful. Fifty-four percent of participants rated flyers as less effective or without effect. Posters and information screens are rated better, with more than 40% of students saying that the information is "very effective" or "rather effective". This is especially true when moving images are visible on the screens – a finding that arose from additional comments.

The fourth question (*"How often do you use the following services?"*) was designed to discover which social media channels the students used. Four out of five students (79%) said they did not use Twitter, but Facebook and YouTube usage was relatively high, i.e., at least once a day. Participants indicated they used Instagram (42%) and WhatsApp (89%) several times a day. When it came to accessing library services via social media, a different picture emerged: There were hardly any followers on Twitter and YouTube, the figures for the newsletter and for Facebook were all together significantly below 10%. The social media channels did poorly: WhatsApp: 8.7%, Facebook 7.8%, Instagram: 5.7% and Twitter: 0.5%. In view of these low levels of use, the library may have to rethink and restructure its commitment to social media.

Only minor demands are being made on the library's capacity for informational services (Question 5). Seventy-five percent of participants would prefer to inform themselves independently and 16% would choose the newsletter. The information students wish to receive from the library is directed more towards practical, general information than content: eighty-seven percent want to be informed about opening hours, 75% about special events, 74% about general dates, 67% about trainings and courses, and 47% about media updates.

Recommended Actions

As fields of action and recommendations for the future, the following points are identified for the target group of students: The library should be present as a companion and guide in the student life cycle from the very beginning, i.e., from the time of enrolment. To accomplish this goal, a systematic process of getting to know each other should be developed, cooperating with student representatives (introductory weeks) as well as including faculties and lecturers as reliable and sustainable contributors with special programmes. Additionally, library services and news could be integrated into the online learning platforms of the faculties and institutes to increase visibility in just one system. The library must work on advertising and marketing its resources and reconfigure its social media presence to be attractive to students. Last, but not least, as students expressed a desire for more individual and group library workstations with sockets, these should be provided.

Results - Scientists

Results of the interviews and the online survey are summarised in clusters of content, as this seemed more appropriate for the form of data collection.

Research behaviour and usage of digital services

Results of the interviews showed that research takes place almost entirely online. Eighty-six percent of respondents (30 out of 35 participants) researched exclusively on the web. The high relevance of online sources and the low importance of personal visits to the library reflect some statements from the individual interviews: "I haven't been to the library since my studies."; "In the last six years, I used the library perhaps twice and that not even by myself, but by my assistant."; "[I research] online, but the decentralized library of the faculty is also important!"

Since most library usage is online, it is important to know which digital services the scientists know about and use. The online survey revealed that some digital services were unknown to many scientists and there were no differences in status groups or faculties (Question 1). Seventy-five percent of scientists didn`t know about the Competence Centre for Research Data Management. Additionally, the majority of respondents were unaware of the Open Access portal for teacher training – Edu-Pub (72%), and service of DOI allocation (55%). E-course reserves were by far the most frequently known about and used (42%). Repositories (11%) and Digitisation services (13%) were also used, but much less frequently. Between 20% and 43% of the respondents knew about digital services without using them.
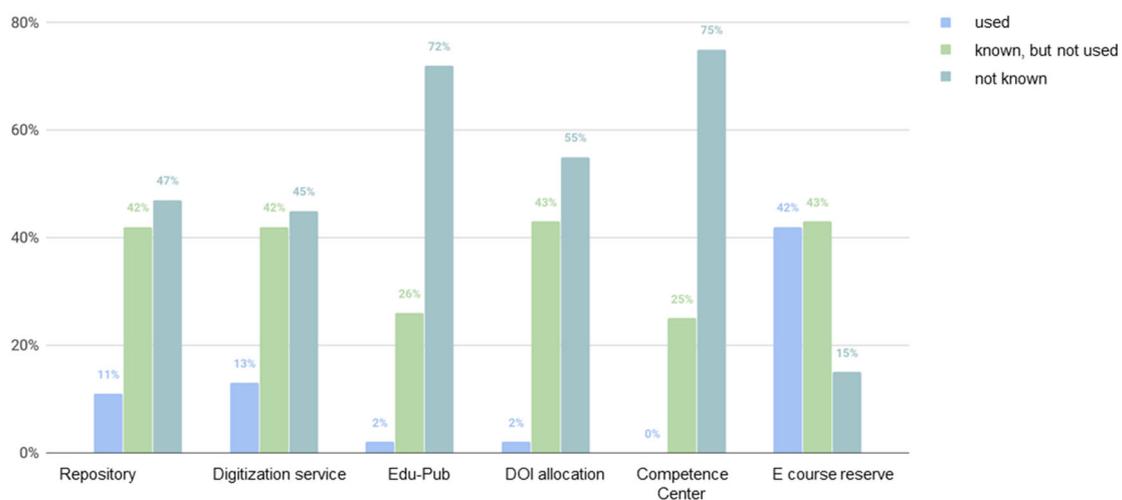
Fig. 1: Usage of USB services (Online survey) [Which USB services do you know / use? (N=53)

Individual interviews showed a similar situation. Here, too, the majority of participants were not familiar with the library's digital services and the participants explained the reasons for the low level of awareness. This included the fact that this offering is often not perceived as library services. One user stated: "I didn't even know that you can have DOIs assigned via the USB". Another reason could be the low demand of scientists for digital services. In an interview, a user mentioned: "We don't really have to digitise anything. If we publish something, it's usually in journals." In summary, there is both little knowledge and little use of digital services by scientists.

Experience with USB information and communication channels

Both research methods showed that the participants had little experience communicating with the USB. The users perceived a low level of communication as relatively unimportant. For the USB this has two meanings: the scientists are satisfied with the current status of general communication, but they do not consider USB and its services essential to their research work.

Use of social media

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[1] *What USB services do you know and/or use? (N=53)*

To determine the relevance of social media for the participants, the first question concerned private use of social media. In the online survey, WhatsApp was the most frequently used service, with 45% of respondents using Messenger several times a day. Facebook showed a strong contrast: while 27% of respondents used the network once or several times a day, 47% said they never did. Twitter and Instagram played a subordinate role in user behaviour. YouTube is used less often, but by most participants: Only 21% of respondents said they never used the video platform.

Similar to the target group of students, scientists rarely used USB library channels in social networks. Of those who regularly used Facebook, only three subscribed to the USB channel there (corresponds to 11%). On Twitter there were also three subscribers (corresponds to 6%), while none subscribed to the YouTube channel. Limiting use of social media to private purposes was stated most frequently as the reason, with only a few interviewees mentioning a lack of interest in the resources of USB. A further reason became apparent from the individual interviews: most of the scientists knew nothing about the fact that USB is active in social media. As with the students, answers to the question point to the necessity for developing specific marketing measures and increased public relations work.

The results show that social media are relevant communication channels for USB, with the exception of Instagram, which is rarely used. Overall, young scientists are increasingly using social networks, so the potential of this communication channel could increase over time. WhatsApp offers potential for USB due to its high usage intensity, but scientists – as well as students – use this service mostly for private purposes.

Informational needs of scientists

While respondents in the individual interviews stated they had little interest in USB information as a reason to not actively provide themselves with information, many were quite open to information on specific topics. This indicates that USB provides an attractive option for many scientists but is not sufficiently known to them. According to information provided by the interviewees in the online survey, there is a need for information primarily in the areas of "Restrictions in operating procedures", "Changes in opening hours" and "News in the library collection". These results strongly correspond to expressed student needs.

Sixty-two percent of respondents expressed a need for services outside of the "classic" USB tasks. Here, information on copyright, open access, and new tools were the main requests. Interest in the information mentioned was above average among doctoral students. It seems almost a paradox that these requirements are often already available in the library.

The most frequently mentioned preferred information channel was the USB website, followed by the newsletter, notices, and Facebook. Interestingly, despite the specific information about which channel is used to make which information accessible, no overall preferred channels for certain types of information could be identified, as needs depend strongly on personal inclinations. Only postings, such as Facebook for events, are generally favoured.

Individual interviews also revealed that many scientists would like a personalized selection of information. This can be done within the framework of an individual selection or adapted to their field of study. This is intended to avoid an excessive flood of information, which often leads to a widespread disregard for the information as a whole.

Use of the website

The online survey showed that 75% of scientists visit the USB website regularly. In individual interviews, this figure was 50%. This result also underscores the relevance of the website as a USB communication channel. The clear difference presumably results from a methodical approach or from self-selection: participants in an online survey are an internet-savvy target group.

The main purpose of website usage is to research and retrieve literature. More than half of the respondents to the individual interviews stated that they used the website for this purpose. The catalogue search item received mixed results. In addition to positive statements, there were also negative responses that described the research process as complicated and confusing.

In addition, further services, such as the use of USB licenses for research in external databases or the extension of library collection, were mentioned within the scope of the purposes of use. The search for information, for example about opening hours, also plays an important role in the use of the website.

Use of the newsletter

At no point in the survey did the results of the individual interviews and the online survey differ as much as in the use of the newsletter. In general, the newsletter is currently only used by a small number of scientists. In the online survey, 30% of the participants indicated that they had subscribed to the newsletter, and 94% said that they read it regularly. In the individual interviews, 15% of respondents said they had subscribed to the newsletter. All of them said they read it. Here, too, the difference in response behaviour can be traced back to the methodology: participants in the online survey had deliberately taken the time to read the email inviting them to take part in the survey. It can be assumed that this group of people has a disproportionately positive attitude towards a newsletter. On the other hand, social desirability in the individual interview could have led all subscribers to the newsletter to state that they also read it. Also, no connection to the faculty or status group was recognizable with the subscribers of the newsletter.

In the search for reasons for not subscribing to the newsletter, it became apparent in the individual interviews that many respondents were unaware of the newsletter's existence. Others were simply not interested or found the newsletter to be too long. This is consistent with the answers concerning interviewee opinions about the newsletter. While some participants praised the clarity and informational content of the newsletter, others voiced concerns about information overload.

If I had three wishes….

In the final part of the investigation, the scientists had the opportunity to make three suggestions to the USB. The scientists repeatedly praised USB and the commitment of the employees. Furthermore, they provided numerous suggestions for improvement, which could be divided into different categories. The most frequently mentioned wish was an extension of the collection, which is not surprising when asked about the use of a library. This applies not only to the analogue stock, but also to digital offerings and the provision of access to databases. Many participants also expressed wishes that would benefit their students, such as a larger reference collection of textbooks.

In addition, respondents commented on the research and lending process, especially via the website. There is a need for more support in this process that some respondents described as confusing and complicated. Additionally, there were requests to order and deliver literature from other libraries. There was also a desire for more support in the publication, indexing, and archiving of publications. Regarding the USB website, some wished it were more user-friendly. For many employees, the procurement of a library card was a cumbersome process, which is why some of them decided against it altogether. One criticism was that there are different cards for the different USB libraries. Access to the library itself should be as uncomplicated as possible. In addition, there was a desire for a more comfortable atmosphere as well as more workstations and sockets.

Personas

A further result of the individual interviews was the creation of personas. A persona is a fictional, yet realistic, description of a typical user of a product, system, or service. The information is personal, goes into detail, and the fears, needs, preferences, and patterns of action of the persons are also broken down by questions about behaviour (Goodwin, 2008). Personas enable the development of user-centered products and services and serve to better align future planning with the wishes and needs of users. They are archetypal for certain user groups but are not directly oriented towards individuals. They are usually created in the form of a true-to-life and realistic description in which certain characteristics are briefly formulated and categorized. By using personas in the development process, the different user types can be made more tangible (Harley, 2015).

Fig. 2: Persona Jörg Speier

The study group developed four personas to help library staff come closer to understanding different user types among scientists.

Recommended actions – scientists

Focus primarily on new services

The USB is the most important library for the scientists of the University of Cologne. It is valued for its range of literature for scientists and students and is seen as a central component of the university, but its more recent, additional offerings are used less frequently and are less well-known. They complement the library's range of services and expand the brand core in addition to the classical range of literature. Special marketing for these new services is, therefore, extremely important. In this context, for example, an "alert search" is desired, which automatically applies a search based on predefined criteria to all new USB publications and sends corresponding notifications, if successful. Such a system already exists as an RSS feed. However, this system is hardly used and should be replaced by freely storable personal search profiles that are easy to handle.

Expansion of digital services

Individual interviews revealed clear preferences for digital services, particularly to accommodate exclusively online research in books and journals. In addition, digitisation is expected to lead to an ever-increasing preference for digital services (among people of the same age group), which will necessitate a shift from analogue to digital offerings.

Advertise more actively for the newsletter / Personalize newsletter

The newsletter achieves quite a good reach and is read by the subscribers. Apart from the newsletter, there are hardly any possibilities for reaching the scientists in a targeted and reliable way and maintaining a desirable, constant flow of information. The newsletter is necessary for providing information about new products and services apart from literature, as many scientists remain unaware of USB's range of resources. Informing scientists all of USB services can be achieved by advertising, via the newsletter. Many scientists expressed scepticism about subscribing to the newsletter, saying that they don't read newsletters because the information was irrelevant or that the content of the newsletter was not sufficiently tailored to individual needs. These concerns could be addressed if the contents of the newsletter were compiled according to faculties or individual specifications as a modular system and this change was communicated to them. In this way, on a small scale, USB could respond to the often-expressed desire for individualised information offers.

Stronger participation in the selection of new literature and service offerings

Scientists have repeatedly expressed a desire to participate in the acquisition of new literature, although this service already exists and is even offered in the event of unsuccessful searches. This participation offer is one of the few possibilities where information can be given to USB and a need for communication can be satisfied. Proactive advertising for the suggestion system or even active requests to lecturers and chair holders could lead to USB being considered as a source of literature by a larger circle of people. The entire communication process could be systematised and take place regularly.

USB website usability

Some of the scientists complained about a complicated search function or a lack of website clarity. They noted that the search function deviates from basic, standard patterns and is not intuitive. Additionally, the website is not clearly structured. Such a negative perception could quickly lead to the (complete) abandonment of a service. However, the usability of the website and other services was not the primary component of this study. Based on the feedback, a usability test should be conducted to obtain a more comprehensive and reliable result from which further recommendations for action can be derived.

Welcome package for new employees

A welcome package for new employees that explains all products and services in easily understandable, non-technical language could help bring new staff nearer and earlier to the library. The welcome package could also include an offer to subscribe to the newsletter and information on special USB services. In order to increase the attractiveness of the welcome package, cooperation with university administration (HR division) might be helpful.

Summary & Conclusions

Looking at the development of university libraries, two very different aspects become apparent. First, there is the very intensive use of the "library as a place", where students appreciate media and a learning environment as ideal conditions for learning. However, the second aspect is more problematic: the increasing difficulty of initial accessibility and the necessity for continuous communication with all target groups, who often show little interest due to many digital offerings outside the library. An early and systematic "onboarding process" for both students and scholars, clearly demonstrating the many benefits and offerings of the library, could improve this situation. The integration of library services into the faculty systems could also bring attention and increased use, since only one system would need to be used. This applies in particular to new services, such as research data management systems, the introduction of which should be made known as widely and rapidly as possible. Targeted marketing outside the library, therefore, is an important task for introduction of new, and often, digital services. Another important area to address is the personalization of services, so that information is received in a concentrated and precisely tailored manner and designed to be relevant to the topics of one's own discipline or research field (e.g., in newsletters). A review of engagement in social media networks needs to be conducted, since the expressed desire for exclusively private use of certain platforms (WhatsApp, Instagram) makes a rather reduced presence appear appropriate at this point. The results of this study are transferable in many parts to other libraries. Future studies might address implementation of additional measures to increase utilization of library resources, and, additionally, repetition of similar studies at suitable intervals could focus on implementing changes in user behaviour over time.

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Identifying and meeting the needs of post-graduate students in the academic library:
A two method approach

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Abstract

Although many universities have prioritized increasing post-graduate student (post-doc researchers, doctoral students, and master's students) recruitment and improving their retention, research indicates post-graduate students' needs are under-served in academic libraries (Fleming-May & Yuro, 2009; Gibbs, et al., 2012; Baruzzi & Calcagno, 2015). There are several factors that further complicate addressing the needs of these students. Post-graduate students are a diverse group, not only in demography, but also in discipline and educational degree level (Covert-Vail & Collard, 2012). Therefore, it is imperative that services directed at these students be tailored to their specific needs (Rempel, 2010). The purpose of this study is to examine post-graduate students' research needs through two distinct assessment methods to provide insights that will help librarians provide tailored and holistic support.

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Implementing an Assessment Program in Response to Stakeholder Need

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Introduction

More than ever, due in part to financial pressures and tightening budgets in post-secondary education, it has become essential that libraries communicate and demonstrate value. The idea that libraries are good, worthwhile, or deserving of funding simply because they are representative of a "public good" is not as widely accepted as it may have once been. Libraries require significant investment from stakeholders, who in turn expect a return on their investment in terms of better educational and post-programme outcomes for students and top-notch support for research within the competitive U15 Canadian university environment.[1] Traditionally, libraries have gathered statistics around budget allocation, number of staff, information technology, and facilities and equipment, and reported them in annual reports. In the Canadian post-secondary context, traditional statistical collection practices have been informed to a great extent by the requirements of the *Canadian Association of Research Libraries* (CARL) and the *Association of Research Libraries* (ARL).

The indices collected by the University of Manitoba Libraries (UML) in fulfillment of CARL and ARL reporting requirements are, on their own, insufficient for assessment and benchmarking its local activities. Furthermore, they do not communicate value to the end user, show accountability for the vast resources that libraries are responsible for, or demonstrate the Libraries' contribution to the overall organizational mission. It is under this challenging set of circumstances that the authors found themselves in September 2018, as they received a mandate to design and implement a robust assessment programme within nine months.

This paper outlines the steps that the authors have taken as leads on the University of Manitoba Libraries' Assessment initiative to create favourable conditions for the smooth deployment of a complete assessment strategy where the conditions are anything but ideal, and time is in short supply.

Background

A recent institutional move toward a decentralized, responsibility-based budgeting model at the University of Manitoba has necessitated an accelerated approach to establishing a formal library assessment program. The University's new budget model is guided by several fundamental principals, including "…aligning resource management, planning, and allocation with the University's mission and strategic priorities…" and "… incenting creativity, innovation and the pursuing of revenue opportunities to position the University for a strong, sustainable future…" (University of Manitoba, 2018). Under this model, the UML is positioned as a "central support unit" and the allocation of operating revenues and central support costs to academic units are based on algorithms (University of Manitoba, 2018).

Directives from university administration required that the UML move quickly to collect and communicate a variety of purposeful measures that would serve to demonstrate the impact that the UML is having on academic success and research output at the University of Manitoba. While the UML has been working toward implementing a formal assessment

programme for some time, the new institutional fiscal reality placed practical and achievable timelines out of reach. Like so many other publicly-funded universities in Canada, provincial/public funding has been shrinking, leaving institutions to make up for budget shortfalls through private funding and other ventures. Neoliberal ideologies, which hold that the free market should extend into every part of public and personal life, have permeated the values of the post-secondary institution (Harvey, 2015). The neoliberal university has a redefined role in society that involves meeting capitalist demands for tangible value derived from the educational enterprise (Luka *et al.*, 2015). The university libraries that serve under these shifting institutional values necessarily inherit these strategic directives that may serve to move them away from their core professional values and priorities.

The UML assessment team found themselves needing to balance stipulated institutional priorities within a new budget environment against national collection and reporting requirements, and the UMLs own values and vision for the future. The team had nine months to assess current collection and reporting practices, devise or suggest a homogenous tool or process for all-unit reporting, develop key performance indicators, and implement a data dashboard. Compounding this challenging situation was the fact that the UML had been without a strategic plan for several years. The assessment team moved forward with a document containing strategic priorities that had been drafted by a recently departed university librarian.

Design, methodology or approach

Upon receiving the mandate to design and develop an assessment program, a small and strategically-appointed team was assembled. The group comprised the associate university librarian with assessment in their portfolio, the collections coordinator, user experience librarian, project manager, and two unit heads, and was purposely limited in numbers and representation in order to move the project forward rapidly. In light of this necessary limitation, the team agreed that as the primary drivers of the vision and outcome for the entire system, that an opportunity for consultation with coordinators and other stakeholders would be facilitated once preliminary plans and infrastructure were in place.

Two members of the team had previously conducted a survey of library heads regarding statistical collection practices for a report they prepared for senior library management in order to recommend that the UML move to collect meaningful measures (Shaw and Vokey, 2016). This work allowed the team to review and summarize current practices in an expedited manner and focus on mapping timelines and deliverables. It also facilitated quick agreement on the chosen approach: the balanced scorecard.

The team agreed on six key milestones: 1) the development of a data inventory for the entire library system; 2) the creation of strategy maps, key performance indicators (KPIs) and sample balanced scorecards (BSC) representing four pillars (Collections, Indigenous Achievement, Learning and Instruction Support, and Research Services) taken from the libraries' strategic priorities document; 3) structured interviews with key stakeholders working within the library system; 4) further revision of scorecards by the committee based on feedback from stakeholders; 5) approval of revised scorecards by libraries' management group; 6) creation of a prototype data dashboard.

The balanced scorecard approach measures performance across four perspectives (financial, customer, process, and learning and growth) which is derived from the organizational mission, vision, and strategy. Strategy maps served to complement the BSCs by illustrating the causal relationship that connected the four distinct perspectives, and they were integral to keeping the team mindful of competing interests and the need to resolve them. Key questions that were explored included: how well do the UMLs strategic priorities fit with a BSC approach; what are the meaningful measures, or KPIs that should be considered; what metrics are currently collected and why; what additional measures need to be gathered to properly inform proposed KPIs; and how can the chosen KPIs be appropriately displayed in a data dashboard (Gottschalk, 2019).
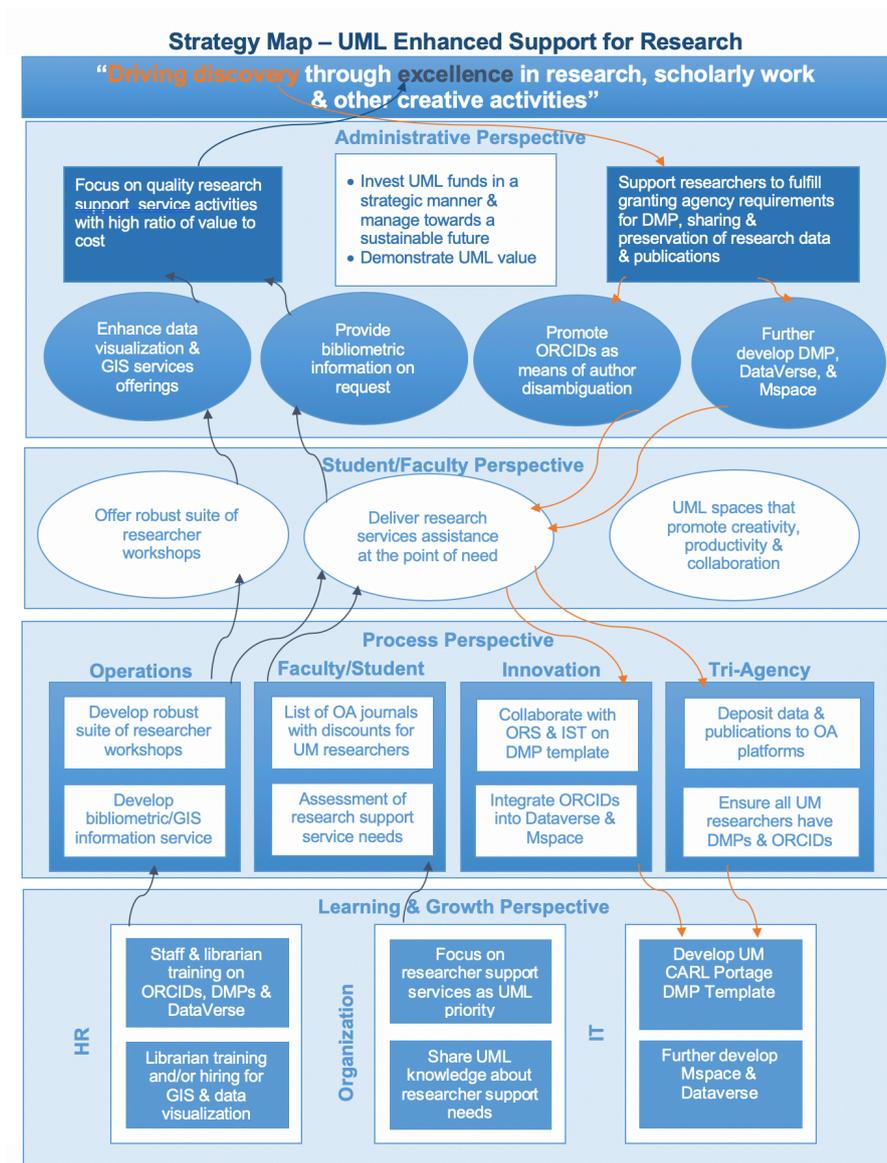
Figure 1: Sample strategy map for research services.

Findings

Several insights and challenges arose throughout the development of the assessment programme. Assessment team members realized that there were longstanding challenges within the organization that could hinder the timely deployment of the assessment program; however, the situation was worse than anticipated. For example, an assumption had been made that all units were collecting and reporting some measures and outputs, albeit in a haphazard manner. In reality, there were several critical gaps in data collection across units that required dedicated attention and time, thereby placing tight timelines in jeopardy.

Furthermore, the collected statistical measures were not sufficient to inform KPIs. The UML currently collects less than ten percent of the measures that were included in the final BSCs (see figure 2). In several cases, the collection of newly-identified required data will require an investment of time from the affected unit or department.

Balanced Scorecard – UML Enhanced Research Support

Currently collected internally ■ CARL data ■ New data not currently collected ■
Bold text are priorities as currently worded in UML Strategic Priorities document

Key Strategic Priority	Key Strategic Measure (KPIs)
Administrative Perspective	
Focus on quality research support service activities with high ratio of value to cost	
Provide bibliometric information on request and in support of grant applications, accreditation, reviews, etc.	• # of bibliometric information requests completed
Enhance UML data visualization and GIS service offerings	• # of training sessions offered on data visualization or GIS by faculty or department
Support researchers to fulfill granting agency requirements for DMP, sharing and preservation of research data & publications	
• **Promote ORCIDs as means of author disambiguation and research consolidation**	• # of training sessions (individual or group) delivered on ORCIDs by faculty or department
• **Further develop Portage CARL DMP template; Dataverse; and MSpace for storage and sharing of UM researcher data management plans, data sets, and research publications**	• # of uses of UM Portage CARL Data Management Plan template • # of data sets added to Dataverse • # of open access publications added to MSpace

Figure 2: Sample of a portion of the BSC for research services from the administrative perspective.

It became apparent during the structured interviews and in discussions with the libraries' management group that UML librarians and staff were unfamiliar with BSCs. The interviews served as a learning opportunity for some, and in other cases, the team sensed some resistance and pushback toward the idea of creating indicators to monitor and assess outcomes. This called for an ongoing effort on the part of the team to address misinformation and put doubts to rest.

Developing an assessment programme without the benefit of a library-specific strategic plan was challenging and led to two key issues. In developing the KPIs, the team had to work with a "strategic priorities" document, which was much more time-limited in terms of scope. In other words, the strategic priorities document was not future-focused, nor did it articulate a mission or values for the Libraries. Consequently, some of the KPIs were very time-limited and lacking in longevity, and the team was left to make assumptions about value and mission. Furthermore, the team felt that due to the external mandate from university administration to complete the project and because the Libraries' strategic priorities document was constructed to fit within the University's strategic plan, that there were certain limitations in what they could achieve. Without an articulated vision, mission, and strategic plan, the development of KPIs responded primarily to institutional imperatives at the expense of library-derived goal-setting and future-focused growth.

One of the most unanticipated outcomes of the drive to implement an assessment programme was the degree of contention that arose over data collection and associated tools, and areas of reporting responsibility. Local practice amongst those in Collections, Technical Services, and Public Service, for example, vary widely are have developed in keeping with tools and methods, both formal and informal, that reflect their different contexts and reporting requirements. Corralling all inputs into a single environment has led to prolonged evaluations of software trials and debate. Additionally, the team found themselves having to make decisions around where some inputs and outputs would reside under the four-pillars configuration. For some measures, there was obvious overlap in reporting responsibility, but in the end, only one could be chosen. These have been trying and politically-fraught conversations.

Finally, creating strategic data dashboards involves substantial time and effort, but is critical to the success of a robust assessment programme. At a minimum, developing an excel spreadsheet with a supporting data dictionary can meet the needs of many academic administrators for a data dashboard.

Figure 3: Partial prototype data dashboard for research services.

Practical limitations or implications

The limitations of this project primarily centre around the concise timeline, the need to negotiate the tension that arose from meeting the requirements of an externally-supplied mandate while trying to remain faithful to the priorities and values of the UML, and the lack of strategic planning within the library system. Nonetheless, a robust assessment programme was developed, and several valuable lessons were gleaned from the process.

While the resultant product may be substantial, it is not perfect. Given the circumstances, the team agreed that it was aiming for "progress, not perfection." This approach allowed team members to accept some shortcomings and not get snagged by them while noting areas for further future adjustment. The strategy map (see figure 1) provided an avenue for incorporating the administrative perspective, but the project was lacking in full consultation with this vital stakeholder as well as other key academic administrators such as deans and department heads.

A number of key recommendations based on the results were developed: 1) the BSC approach should be a continual process that involves senior management in reviewing metrics and targets, as well as an annual review to determine if core elements are still appropriately telling the UML story; 2) the collective review should reduce the total number of KPIs that were generated no more than twenty per BSC; 3) there should be an effort going forward to incorporate more financial metrics with an eye to improving balance; 4) a need to achieve a better mix of input, output, and outcome measures over time, perhaps through the process of strategic planning; 5) assigning a target (high target = full success, low target = partial success, no target = no success) to each KPI that is aspirational and representative of the desired results of performance measures (Gottschalk, 2019).

Some takeaways from the experience of pulling together an assessment program with a quick turnaround and an externally-supplied mandate include:

- assemble a lean team

- select an approach that will help marry and make transparent the mix of institutional imperatives and library goals and values (especially critical in the absence of library-based strategic plan)

- work with library units and departments early in the project to identify current collection practices and foster awareness that local practice will likely be subject to change

- focus on strategic consultation with a limited few influential and essential stakeholders

- create a communication and education strategy for necessary stakeholders about the chosen approach and the importance of collecting meaningful metrics at the beginning of the project.

Conclusions

It is possible to establish a robust, albeit imperfect assessment program on an accelerated timeline. While there are many excellent papers on the topic of assessment in libraries that focus on 'how to do it right,' this paper serves to convey a unique perspective on one institution's experience with 'how to do it right now" in response to externally mandated pressure. Though this is likely not how any library organization would wish to proceed with such an initiative, it is nonetheless increasingly realistic given ever-increasing demands for libraries to prove financial accountability in the context of the present neoliberal higher education setting.

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[1] The U15 Group of Canadian Research Universities is a collective of some of Canada's most research-intensive universities. Collectively, the U15 comprise 80 percent of all competitive research in Canada, and is often used as a competitive benchmark. http://u15.ca

Increasing library intelligence by harmonizing assessment tools

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Purpose: Academic libraries are considered as key factors in the educational system of a country and strong pylons for the economic development and societal cohesion. Libraries have always intended to provide qualitative services and frequently run surveys that measure the opinion of their users. Our contribution aims to show how the findings of a survey can be aligned with information from other assessment tools to better inform library management.

Design, methodology or approach: We analyze external data of our Library's performance as collected by an electronically conducted survey in May 2018. The initial objective was to collect 1000 questionnaires from all registered Library users; however, 950 questionnaires were collected in a two weeks' period, securing the quota sampling conditions. Descriptive statistical analysis via SPSS was conducted to find the key measurements and to explore deeper the various associations. At the same time, we compared the scores of library performance as reflected in internal managerial assessment practices over the span of two years.

Originality and value of the proposal: This study applies a framework that exploits the existing percentage measurement scale for the assessment of Greek public sector employees to gather users' opinion on certain performance categories. This scale, as well as its interpretation module, is used for the defragmentation of the information that comes from varied assessment notions, tools and practices.

Research or practical limitations or implications (as applicable): The study is a quantitative one. It is constrained by the country conditions, which cannot be the same elsewhere, but it gives an example how various assessment tools can be coordinated.

Findings: Our survey findings showed that the library users were well satisfied with the conduct of staff and think that the library has margins for improvement to fulfil its role as a study place and collection. These findings seem close to the respective internal assessment scores. Therefore, our study showcases that there can be a harmonization of various assessments tools, internal and external, and the library administration can be informed about its performance in a coherent way.

Conclusions: The present study offers a new viewpoint for the harmonization of various assessment tools, either coming from the library user base, or from the public sector management.

Submitted to Open Access journal, so not included in Conference Proceedings.

It looks nice, but does it work?

Using Student Learning Outcomes to assess library instructional spaces

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Abstract

Remodeled, updated, technology-rich spaces look great, but how can we assess if they are improving student success? What kind of data tells the story? This lightning talk will discuss how a mixed-methods approach to assessing student learning outcomes was used to determine the efficacy of redesigned library instructional spaces.

Design, methodology or approach

In 2017, the library at San Diego State remodeled one of its two classrooms to support active learning. As a result, librarians changed teaching approaches to include more small- group work to take advantage of the new setup. Observationally and anecdotally the changes seemed to improve student learning; students participated more in class discussions and informal feedback from instructors was positive. In order to understand the impact of the space redesign more concretely, the author undertook a pilot study to compare outcomes from the active learning classroom and the traditional computer lab classroom.

The assessment project was done after teaching one-shot library sessions for different sections of the same course in the active learning classrooms and the traditional computer lab. After the sessions, students completed surveys to assess their affective reactions to the instruction and their feelings about the resources available in the library. The students also emailed the librarian copies of the articles that they selected, either individually in the computer lab classroom or as a group in the active learning environment, which were then analyzed for quality, relevance, and authority using a rubric. This mixed methods approach to assessment sought to understand how students felt about the utility of library instruction and library resources and also directly evaluate the outputs of the session. The results could then be used to evaluate the success of the classroom redesign.

Four class sections of a first-year writing course participated in this assessment project in the fall semester of 2018, with a total of 100 students. The mixed methods assessment consisted of two parts; a survey and a rubric evaluation of the selected source. The survey asked students how useful (using a Likert Scale) they found the instruction session, how likely they were to use the library in the future and if they felt the library helped them succeed. The mean scores from the traditional computer classroom sections were slightly higher for the survey questions, though it was not high enough to be statistically significant.

The other method used to assess learning in the different spaces was a rubric evaluation of the sources selected. Students emailed the librarian a copy of a peer-reviewed article that they selected either individually (in the computer lab) or as a group (in the active learning classroom) and a rubric was used to evaluate them for quality. The articles selected by students in the active learning room had a slightly higher average score, however, it was not large enough to be statistically significant.

This was a limited assessment project and as such, the results may not be generalizable to other institutions, or even other types of library instruction. However, the methodology could be useful for other librarians interested in assessing the impact of library classrooms. In order to standardize as much as possible for the pilot, the same librarian taught all four sessions. In the future, it could be useful to recruit more librarians to assess their sections using the survey and rubric.

The results demonstrate that students are selecting high-quality resources and feel positive about library instruction and the resources provided by the library after instruction in both library classrooms. The data did not demonstrate significant improvements in student learning outcomes or attitudes in the remodeled active learning classroom. The redesigned, active learning classroom is as effective as the traditional computer lab classroom. This both validates the remodel and allows librarians to select whichever room suits their teaching style and instructional needs, without sacrificing student learning.

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Making Sense of Flipping Data

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Abstract

This paper details the approach used, and assumptions made, in a project that worked with journal publication, subscription, and article processing charges (APC) data. The project sought to test if the resources allocated by the seven Universities in the Matariki Network (MNU) for journal subscriptions would pay for APC required if their current level of publishing activity was made open access.

It has been asserted that there is enough money in the global academic library journal subscription system to 'flip' from subscription-based access to gold open access (open access "funded" by charging authors APC). In this scenario there would be no reason to continue with journal subscriptions for access and the money would be diverted to cover APC. Some rudimentary calculations show this could be the case and when tested in more detail this assumption has been upheld for some scenarios across several large-scale research universities in North America. This project sought to investigate how applicable this assumption is to medium sized research universities such as those in the MNU.

Within research intensive universities, institutional and researcher performance is measured by the impact and value of research publications. A Library's performance is measured on how the subscriptions budget is allocated and how well access to these subscribed journals meets the needs of the University. It is crucial that Library managers stay abreast of the wider scholarly publications landscape, and collate and analyse local data so as to inform decision making. As the scholarly landscape evolves performance will increasingly be measured by how well a library responds to these changes.

Data was collated and analysed to test whether individually and collectively, the amount of money Matariki partners pay for journal subscriptions is enough to cover APC when Universities move from a subscription model to a gold open access model. This involved using publication data for one major publisher and subscription data from three years (2015-2017) for each of the seven partners. Further work was carried out to determine what the average APC would need to be if each partner only had their subscription budget to pay for the articles that their authors publish.

This project was conducted successfully. A range of assumptions were made in dealing with the journal, subscription and APC data. It was difficult to identify a subscription package that was common to all the partners. Data was not always consistent and in some instances it was incomplete. An iterative and flexible approach was required in this project. Even though testing had been carried out during planning, changes had to be made as the project was carried out. The timetable had to be flexible as those working on the project dealt with their day to day operational priorities and to enable each of the partners to contribute as resources allowed.

This paper specifically focuses on the details of the approach and assumptions made in the investigation so that others interested in repeating this project, or carrying out a similar project, can consider this in their planning.

As alternative models of scholarly journal publication are evolving it is important that the implications of these be tested to inform planning. Details of this testing need to be shared so that others can confirm the results, consider the approach, and apply lessons learned.

This paper is distinctive in that it details the approach used, and assumptions made, in a project that worked with journal publication, subscription, and APC data to test if the resources allocated by a group of medium sized universities would pay for APC at the current level of publishing activity.

This paper has been submitted to the Conference Special Issue of Performance Measurement & Metrics.

Measuring the effectiveness of a library workshop in a new active learning space

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Abstract

Student engagement in instructional settings is one of the key questions in library scholarship. This paper reports on exploring the effectiveness of an "Intro to Library research" workshop offered to students in first year writing courses. The workshop has been offered for several years, and the content has been refined to focus on key information literacy concepts. In spring 2019, some of the workshop sessions moved to a new active learning space that was designed to accommodate the needs of diverse student population and improve learning outcomes. In order to investigate the impact of the active learning environment in mediating student learning, we conduct a mixed methods study, using a concurrent qualitative and quantitative design. First, we use the student satisfaction surveys to understand how the students feel about the new space and what they identify as their learning outcomes. Second, we analyze one of the key activities in the course, which focuses on source evaluation, a critical information literacy skill. In this case, we rely on observation notes and photos of students' work. The presentation will compare the initial outcomes for the active learning space with those in a "traditional" classroom and provide practical suggestions for using these performance measurements in similar contexts.

Introduction

Critical inquiry skills are one of the most important skills that a student can learn in the University. Research suggests that multiple factors can impact the student's mastery of these skills including a focus on active learning pedagogies as opposed to a traditional lecture-based learning experience (Foldnes, 2016 and Stover and Ziswiler, 2017). Active learning classrooms (ALCs) are learning spaces that have been designed to facilitate and promote active learning. Research on learning space design has demonstrated that the design of a classroom impacts the way in which students and instructors interact and engage in teaching and learning. Active learning strategies often involve complex, student-centered interactions between professors, students, local, and global communities. The physical space of an ALC promotes and encourages these interactions though accessible and flexible classroom design.

In the summer of 2018, the University of Minnesota Libraries had an opportunity to develop an under-used office space into an Active Learning Classroom. The guiding principles for this design were to create a flexible, comfortable and accessible space for students and instructors that would also be a catalyst for the best practices in active learning pedagogy. By having larger, more flexible space, the Libraries are now able to better accommodate a full class and vary our teaching strategies and ease the scheduling pressure faced when trying to manage booking multiple classes.

The construction for the space was funded by the state legislature. To show that this was a good investment in student learning, we set forth to explore and compare student engagement, learning experiences and instructor experiences by conducting a mixed methods study, with a focus on using qualitative methods. This paper presents the preliminary data from the first stage of the project and is organized as follows: the next section reviews the literature on active learning and library instruction, followed by a brief outline of our methodology, context, and data sources. Then we describe the results and offer implications for practical use as well as directions for future research.

Literature Review

Active learning is not a new concept in library instruction; there is a large body of research focused on applying active learning pedagogy to library instruction. One study proposed an assortment of active learning exercises to ease student anxiety when learning new technologies (Jacobson & Mark, 1995). Similarly, another study found that using exercises and techniques problem-based learning and group work encouraged students to actively engage themselves in learning

processes and positioned them learn more from library instruction sessions (Detlor, et al., 2012). Whitmore and Laurich (2010) concluded that room arrangement had a positive effect on student engagement. However, room arrangement alone, is not the only influencing factor on student engagement. While not focused on library instruction, Baepler *et al.* (2014) compared traditional spaces with active learning spaces over a semester long course. They found that student learning outcomes were just as good in an active learning space as they were in a traditional classroom (Baepler, et al., 2014).

Other literature suggests similar results but most studies focus on an entire course, rather than course integrated instruction from an outside instructor, as is a common practice in library instruction. Julien (2013) found that changing the classroom environment for information literacy instruction can have a positive impact on teacher and student behavior – but not without challenges like learning the technology and adapting to new pedagogical practices. This study found, through student surveys and librarian interviews, that while new classroom space served as the motivation to learn new pedagogical techniques and that it was the teacher, more than the room that was the most influential element (Julien, 2013).

Overall, research suggests that active learning spaces are conducive to more student engagement. There is a gap in the library instruction literature on comparing the interactions in active learning versus traditional classrooms and generally focuses on changes in pedagogy and teaching performance rather than student engagement.

Methods

This study uses a concurrent qualitative-quantitative approach (Creswell and Creswell, 2014).

Context

Introduction to Library Research (ITLR) is a face-to-face, course-integrated workshop designed, in partnership with The University's First Year Writing program and taught to approximately 2500 first year students to introduce them to the University Libraries and the basics of academic library research. The ITLR curriculum includes mind mapping a research topic, identifying keywords, combining search terms, using filters in library databases to narrow a search, and finding evaluating sources on a topic.

These sessions are generally taught in 2-50-minute sessions, or one 2-hour session in one of our library classrooms. ITLR workshops reach approximately 75% of students enrolled in first year writing courses, and as part of the session they are asked to submit their preliminary topic and complete a short post-session satisfaction survey. These projects look at the two ends of a continuum, focusing on small-scale perception data and large-scale institutional-level data, but missing a middle component that would explore actual classroom interactions.

Of the three main teaching spaces at the University of Minnesota Libraries, none were optimized for using active learning techniques. The University Libraries lacked space for a full-size class of 20-40 students. For example, most of the sessions were taught in a traditional computer-lab configuration with all computers facing the instructor and additional chairs. There was an ongoing need expressed by some librarians for learning spaces with this traditional arrangement (including computers at the ready), as the desktop computers affected sightlines and inhibited rearrangement of the space for flexibility and group discussion.

The new active learning space is a large room with one instructor monitor, 4 student monitors that can be connected to laptops, eight tables, and 32 chairs. The walls are covered with whiteboards.

Image 1. Walter 320 – Active Learning Space

Participants

This study was conducted as part of the regular operation of the program, so we did not make any changes to the procedures. The Libraries instructors who taught the observed sessions have been trained to teach this workshop and have at least one semester of teaching experience.

The students are enrolled in the first-year writing course, and their writing instructors elected to contact the Libraries to set up a session as preparation for a large research paper. Most classes have 20-24 students.

The classes were scheduled in either the traditional classroom or the active learning classroom by our colleague, and we did not have any involvement in the process, thus creating a somewhat random sample. The observations were conducted in March and April 2019, based on schedule availability, so no special effort was made to observe certain sessions and skip others.

Data collection

The data for this project come from two primary sources: student satisfaction surveys and observations.

Student satisfaction surveys

After each ITLR session, the library instructor sends an email to the students, providing links to materials and asking them to fill out a survey about their experience. This email and its contents are typically previewed at the end of the session, so the students know to expect a message from the instructor. The survey is very brief and typically takes approximately 5 minutes to complete. Collecting survey responses has been program policy for the last several years.

In the spring of 2019 we modified the process to collect more nuanced data. We created three separate survey links (the questions were identical) to have separate responses from students whose ITLR sessions were taught 1) in the traditional classrooms, 2) in the new active learning space, 3) one in traditional space and one in ALC classroom.

The survey contains six questions: four rating questions based on Likert scales and two open-ended questions.

Observations

Observations provided the second source of data. Throughout the semester, we observed ITLR sessions and took detailed notes. For privacy reasons we decided not to audio or video record the classroom interactions. We photographed the

whiteboards throughout each session for supplementary analysis of the key activities in the course. After all observations were complete, we developed a coding scheme focusing on the types of interaction:

- Student-student: students working together, in pairs or small groups

- Library instructor – student: library instructor working with an individual student

- Everyone: work done in a larger group with participation of students and the library instructor

- Individual: students are working independently

- Disengagement: students not engaged in assigned activities.

Each code also included a time stamp, so we measured the duration of each interaction. Since some of these interactions can occur simultaneously, some codes overlapped. We started with coding two sessions together. Then, we coded each session independently and afterwards compared codes and discussed the instances where the codes differed.

Data
Surveys

Over the course of the spring semester we collected 30 responses from students who had ITLR in traditional classrooms, 20 from the new active learning space, and 5 from mixed classrooms. For the purposes of this article, we are focusing on the comparison of traditional and active learning classrooms, disregarding the data from the mixed classrooms surveys. Since the sample sizes were not equal, we report results in percentages rather than raw numbers. None of the survey questions are required, so some students chose to skip questions.

Overall satisfaction

All students report being satisfied with the sessions they had in the new active learning space, compared to approximately 80% of students satisfied with their experience in the traditional classroom. Table 1 presents a detailed breakdown of the overall satisfaction.

	Extremely satisfied	Somewhat Satisfied	Neither satisfied, nor dissatisfied	Somewhat dissatisfied	Extremely dissatisfied
Active learning classroom	83.33	16.67			
Traditional classroom	38.24	44.12	2.94	11.76	2.94

Table 1. Student satisfaction with the ITLR workshop

Rating specific aspects of ITLR workshop

The survey asks the students to rate multiple aspects of the workshop, including the room, the handout, and the instructor. The ratings for the handout and the instructor did not show any meaningful differences in the distribution patterns; however, the evaluations for the room show divergence in student perception of their experience. All students rated the active learning classroom (Table 2) as very good or good, compared to 85% of the students who were in traditional classrooms. Almost 15% of students in traditional classrooms felt neutral about the rooms they were in.

	Very good	Good	Neither good nor bad
Active learning classroom	66.66	33.33	
Traditional classroom	50	35.29	14.71

Table 2. The room

Suggestions for Improvement

The final question of the survey asked students to suggest ways of improving the workshop. Below we provide a selection of responses focused on engagement and learning environment. The full list of suggestions also included advice to make the workshop longer and shorter, include and exclude specific activities.

The students in the active learning classroom suggested more time for individual practice, while the students in the traditional classrooms offered a selection of strategies to improve the workshop, primarily focusing on active learning approaches and interaction. This points to the students' interest in interaction-driven pedagogies and their perception of active learning as a more successful educational style.

Active Learning Classroom

- More time to practice going to places on our own

- Both last term's session and this term's sessions far exceeded my expectations.

Traditional Classrooms

- Make the time more interactive with questions and activities

- More time when doing group work

- More whiteboard activities

- More time to explore the library site and other resources.

- make the room more open put tables in a u shape and have teacher in the middle so it's an open conversation and everyone can see each other

- Some slightly more engaging activities

Observations

We had a total of 10 observations, three in the active learning classroom and seven in traditional classrooms. After coding the observations, we performed two sample t-tests to see if there were statistically significant differences in interaction patterns. The inequality of samples presents a statistical complication, but we believe that these results still identify important trends and point to the direction of further research.

The tables below present patterns or interactions reporting the number of instances, total duration, and average duration per session.

One of the categories of interaction is the interaction between the Libraries instructor and individual students. Most occurrences in this category were Libraries instructors answering student questions during individual work time or while the students were completing an activity, such as mind-mapping or source evaluation. There were eight instances of instructor-student interaction in the three observed sessions in the active learning classroom, which amounted to 34 minutes, or an average of 11 minutes per session. In the traditional classrooms, we observed eight instances per 10 sessions, with the total duration of 30 minutes and an average of four minutes (Table 3). While the difference in the amount of individual attention is not statistically significant, it is pronounced and requires follow-up exploration.

	Number of instances	Total duration (min)	Average duration per session
Active learning classroom	8	34	11.33

Traditional classroom	8	30	4.28

Table 3. Library instructor and student interaction

Table 4 presents data on interaction between students, such as working jointly on an activity. Activities in this area included the key activity in the course focusing on source evaluation where students work together in small groups to rank sources from best to worst. In the active learning classroom there were 7 instances with 59 minutes of such engagement. The average length of student-students interaction per session was almost 20 minutes, while in the traditional classrooms there were nine instances with total duration of 61 minutes, and an average of approximately nine minutes per session. The difference in the duration of this interaction type is highly statistically significant (p-value <0.02) and has a moderately high effect size (eta square 0.5, Cohen's f 1.012).

	Number of instances	Total duration (min)	Average duration per session
Active learning classroom	7	59	19.66
Traditional classroom	9	61	8.79

Table 4 Student-student interaction

Individual work time also shows differences between workshops in active learning and traditional spaces. Individual work time included focused search time using library databases. In the active learning classroom, we observed six instances of individual work time, with a total duration of 57 minutes and an average of 19 minutes per session. In the traditional classrooms, we saw 13 instances of individual work time, with a total of 53 minutes and an average of approximately 7.5 minutes. As Table 5 shows, the sessions in the active learning classroom gave students an opportunity to have more focused individual work time with fewer switches between activities, and overall higher amount of time to explore their own topics. The difference is highly statistically significant (p-value <0.013) and has a moderate effect size (eta square 0.55, Cohen's f 1.107).

	Number of instances	Total duration (min)	Average duration per session
Active learning classroom	6	57	19
Traditional classroom	13	53	7.57

Table 5 Individual work time

Another category of interaction that we tracked was large group interaction, for example a whole-class debrief after an activity such as the source evaluation activity. In this type of interaction, we saw 7 instances in the active learning classroom, with 28 total minutes and an average of 9 minutes per session. In the traditional classrooms, there were 20 instances with 90 minutes total, and an average of approximately 13 minutes per session. It seems that conducting the workshop in the traditional classroom is more conducive to longer sequences of the entire class working together. This requires further investigation and may be the other side of using less time for group and individual work.

	Number of instances	Total duration (min)	Average duration per session
Active learning classroom	7	28	9.3

Traditional classroom	20	90	12.85

Table 6 Everyone interacting

Finally, we tracked the total amount of interaction, which would essentially amount to everything in class except for lecture. In the active learning classroom three sessions (200 minutes) amounted to 178 minutes of engagement, or 59 minutes per session. In the traditional classroom 7 sessions (350 minutes) included 234 minutes of interaction, or 33 minutes per session on average. This difference is very close to statistical significance (p-value <0.06) and seems to indicate that overall conducting the workshop in the active learning classroom provides students with a more active, interaction-oriented experience.

	Number of instances	Total duration (min)	Average duration per session
Active learning classroom	28	178	59.33
Traditional classroom	50	234	33.43

Table 7 Total interaction

Limitations

The primary limitation of the data is the small sample sizes, with an uneven number of data points between active learning and traditional spaces. This has particularly strong impact on the statistical analysis, and while we chose to include it, it should only be taken as preliminary data. Second, the observations were conducted over a limited period of time - March and April 2019.

Discussion

One goal of this project was to understand if the findings from other research on active learning spaces and student engagement could be applied to course-integrated library instruction, rather than a semester long course like Baepler *et al.'s* study of active learning (2014). Julien's study (2013) found that it is the instructor, more than the space that increases student engagement. Julien provided pedagogical support for library instructors, while we did not. We did not see significant differences in survey ratings, but the student suggestions indicate that students have a marked preference for active learning techniques. This could also suggest that Likert-scale questions do not elicit meaningful responses in this area, so future work might emphasize focus groups or interviews. Additionally, adding questions into the satisfaction survey that could elicit student learning may be another area of exploration. Having students submit a source or demonstrate learning transfer by completing a source evaluation activity are some ideas.

The observations provided a rich dataset for exploring the patterns of classroom interactions. Here, we choose to report both the total duration of the interaction and the average duration per session, with the second measure being more meaningful as it creates a clearer comparison point. The sessions in the active learning classroom had much higher total duration of interaction, essentially meaning that the teacher-talking time was reduced in favor of students working together and individual work time to practice their research skills. Overall, the students' marked preference for the active learning space as well as the other data around interactions and engagement likely shows that the state legislature made a sound investment in this space.

While this project provides some insight into the interactions in the active learning and traditional classrooms, it also highlights the need for further research, focusing on three main directions. First, we need to investigate whether the active learning classroom context leads to better student learning outcomes such as developing appropriate search strategies, finding and evaluating scholarly and popular sources, and integrating sources into their research projects. We plan to do this by further analyzing the photographs of the whiteboards from the source evaluation activity. Second, we need to investigate the perceptions of library instructors related to the use of active learning spaces so that we can develop pedagogical support where needed. Finally, for the purposes of this project, we were using a traditional classroom lesson plan in both spaces. We need to investigate if a lesson plan that is optimized with active learning techniques produces different results, thus showing whether the environment or the specific set of activities has a more significant impact.

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Monthly Tracking of Key Library Performance Measurement Indicators Through Data Analytics and Visualization

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ABSTRACT

"Submitted to Open Access Journal, so not included in Conference Proceedings"

Purpose of paper

The National Library Board of Singapore oversees a network of 26 public libraries. It has a business analytics department to carry out performance measurements and assessments. One key strategic focus of the department is to provide business insights that would facilitate the formulation of strategies to achieve NLB's vision of developing Singaporeans to be 'Readers for Life, Learning Communities, Knowledgeable Nation'.

The paper and conference presentation will share NLB's data analytics and visualization approach in loans performance monitoring for public libraries at the overall level and by each branch. The presentation will demonstrate the way we make data easily accessible to management and staff so that as a whole, the NLB is agile to respond to challenges and opportunities and our libraries will continue to be relevant.

Data architecture

The NLB adopts the strategy of enabling business agility through centrally-managed core data management services. This architectural principle has served NLB well for all its innovative services. It was envisaged that a suite of strongly-managed and controlled Data Foundation Services (comprising the enterprise data warehouse, data marts, ETL and Hadoop components) would form the bedrock of our data architecture. This has provided the flexibility for NLB to implement the most cost-effective analytics solutions for its diverse analytics requirements. We have a customised data analytics and visualization tool for self-service by staff and houses all the data models that we have built.

Key loans performance indicators dashboards

NLB tracks a considerable number of performance indicators, such as visitorship, loans, web visits, reach (Lee, 2018), membership, patrons' satisfaction, programme effectiveness, etc. The presentation shall be on loans performance. To have a closer pulse on loans performance, a series of interactive dashboards comprising key loans indicators was developed where management and staff could track monthly. The presentation will showcase the dashboards, loans measurement indicators and data in the current year and the preceding 4 years. These comprise Total Loans (physical and electronic); Physical Loans only; E-loans only; Total Loans Year-on-Year; Total Loans Month-on-Month; Total Loans by Branch; Total Loans by Language; Total Loans by Item Age Level; Total Fiction Loans by NLB Subject Suffix; Total Non-Fiction Loans by DDC Class; Total Loans by Age Group; Average Loans Per Unique Patron; Number of Unique Patrons; and Titles Loaned.

For example, from one of the dashboards, we are now able to quickly know that our e-book loans almost doubled from half a million in 2014 to 3 million in 2018. E-books are popular with patrons aged between 20 and 50 years old. We also know that 'Crazy Rich Asians' by Kevin Kwan topped the borrowing charts on both the physical and electronic fronts even before the movie launch in Singapore's cinemas.

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Dashboard design, development and access

Prior to the launch of the dashboards, consultations with management and users were carried out to determine that the indicators were indeed those that users would need. Selection of key indicators was a critical phase as this would ensure the dashboards' usability across a wide range of users. Additional critical data such as the 'Average Loans Per Unique Patron', 'Number of Unique Patrons' and 'Titles Loans', though are not key indicators, have been included as these would allow users to drill down sufficiently to better understand the trends. Data preparation and cleansing were the next steps and required scripting to transform data for computed fields. Once the dashboards were built, user training was conducted.

For all users, access to the dashboards are via their work computer. NLB's management is able to access them on-the go from their iPad. Presently, while loans transactions are captured in real-time, data are uploaded every month. There are plans to enhance self-service such as real-time access and having the dashboards on a centralised intranet site as our data architecture and tools are upgraded.

Benefits to users

Views from users from interviews with them on the usability and benefits of the dashboards will be shared at the conference presentation. One definitive benefit pertains to the tracking of NLB's National Reading Movement campaign launched in 2016 with the key theme 'Read More, Read Widely, Read Together' so as to promote reading. Campaign efforts to promote reading have a strong focus on publicizing NLB's physical and electronic collections and calls to action to make use of the resources public libraries offer. With access to the dashboards, staff has been able to ascertain if the campaign efforts bear fruit. Staff who take care of programmes that are coupled with promotion of our library materials are also able to access the dashboards to determine the success of their efforts.

Conclusion

Key library performance indicators dashboards using a self-service analytics and visualization tools provides up-to-date month-to-month year-to-year data and trends. Staff are empowered to develop tactical strategies by deep-diving on patrons' behaviours so as to provide more relevant library collections, programmes and services.

With the success of the dashboards, the business analytics team in NLB has since progressed to develop other dashboards for access by staff. For example, we have a Library Membership dashboard that enables us to take stock of library membership trends, in terms of overall membership, active and inactive status of members, and trends at the branch level. Insights into library members' profile such as age, gender and ethnicity and geolocation can be derived. With these dashboards, we are also able to analyse library membership before and after library revamps. The desired outcome is to identify segments of library members to reach out to so as to increase the number of active members. Another is our Customer Satisfaction Survey dashboard, and is a one-stop platform to share the results of the current and previous years. Staff can access the specific indicators that are of interest to them at any time. Staff have an easy, readily available means to learn patrons' satisfaction with NLB's various services. This is in line with concerted efforts in Singapore to build an agile public service where data and insights are readily on-hand as and when needed.

National library statistics: how to get reliable data

Ira Foltin, Roswitha Poll

Abstract

The paper describes mechanisms and methods for ensuring consistency, reliability and comparability of data in national statistics of libraries.

Purposes of library statistics

All efforts for evaluation, assessment, or performance measurement of libraries are based on statistical data. There are library statistics

- in the individual library,
- added up as to library types (public, academic, school libraries),
- and summarized on a regional or national scale.

Not all countries collect library statistics, and not for every type of libraries, but most countries do publish library statistics – and everybody uses them. The purposes and options for use are perhaps best described in the International Standard for library statistics ISO 2789:

- to monitor operating results against standards and data of similar organizations;

- to monitor trends over time and the effects of innovation;

- to provide a base for planning, decision making, improving service quality, and feedback on the results;

- to inform national or regional organizations in their support, funding and monitoring roles;

- to demonstrate the value of library services obtained by users, including the potential value to users in future generations.

Given that statistics are so useful and important for libraries, one might expect to find an extensive literature about how to define, collect, analyze and interpret the data, and especially about the problems of compiling data on a national level. But publications about library statistics are scarce. The websites of the organizations that publish such statistics sometimes give information about procedures and problems. Some papers on academic library statistics were published in the 60ies (see e. g. Obeler, 1964; Radford, 1968). In 2001, the IFLA Journal devoted a whole number to library statistics; John Sumsion's editorial "Library statistics to enjoy" is still delightful reading. But generally, the statistics are

evidently taken as given, as a matter of course, needing no effort. Or is the topic too simple, too practical, not academic enough for publications?

Quality of library statistics

In 2010, the Statistics and Evaluation Section of IFLA published a manifesto on library statistics that was meant to demonstrate the importance and value of such statistics (IFLA, 2010). The document states clearly and concisely the criteria for useful and meaningful library statistics: "Correct, reliable and comparable data are crucial for the value and usefulness of library statistics."

The manifesto names three requirements for achieving correct, reliable and comparable data for aggregated (national and international) statistics:

- The definitions of the data as well as the data collection procedures should be standardized, so that as far as possible a statistical value will include the same content in all libraries.
- The informative value of aggregated statistics depends on their comprehensiveness and speed. The goal is all-over participation and timely delivery by the libraries.
- The accuracy of the data depends on careful editing to detect errors and misunderstandings.

The German national library statistics

The example of the German statistics is selected for showing how one specific national statistical unit copes with the problems of achieving comprehensiveness, speed and accuracy of data.

The North Rhine-Westphalian Library Service Centre (HBZ) collects and publishes both the German and the Austrian national library statistics, separately for academic libraries, public libraries, and special libraries for research (https://www.bibliotheksstatistik.de/). The questionnaires are the same for the Austrian and German library groups. The statistics follow the definitions and rules of ISO 2789. The HBZ is responsible for the implementation and analysis of the data, as well as for the technical and editorial support involved.

The statistics are collected yearly. The data are entered online by the libraries or – for public libraries – also by special offices (Fachstellen). "Fachstellen" are institutions for planning and consulting that support public libraries in communities. The funding of public libraries by the "Länder", the federal states in Germany, is processed via the "Fachstellen".

In 2018, more than 7.000 libraries reported their data for the German library statistics. As every library answers about 100 questions (public libraries) or 300 questions (academic libraries), the reviewing effort for the editorial team is immense. The team consists of only 1,88 FTE!

The HBZ provides the data online for all interested parties and generates qualified analysis reports for the Federal Statistical Office and other public authorities.

Standardized definitions

Since 1974, libraries can rely on an International Standard for their statistics: ISO 2789. The standard has already undergone 4 revisions, and a next revision will probably start this year. ISO 2789 tries to consider all types of libraries and all types of resources and services that libraries offer. The last edition 2013 offers 143 detailed definitions of library types, collected materials, services, facilities, financial issues and staff, always giving information about what is included and excluded in the definition and what should be considered when counting.

Most national or regional bodies that collect library statistics rely on this standard, but nevertheless many of them will either devise additional definitions or will at least adapt and change items, according to national specifics. Such modifications do not needs affect comparison, if deviations from the international standard are clearly stated.

For the German library statistics, definitions are discussed in steering groups, separately as to library types. The libraries' questions and misunderstandings are the basis for discussion in the groups.

Comprehensiveness and timeliness

A primary aim for statistics is to get them out promptly, as they can be quickly outdated. The German library statistics try to attain timely data input

- by a well-defined input period (usually January 2 to March 31),
- by reminding all libraries who reported the year before when the input period ends. If the libraries respond, the input period can be extended.

Another goal is of course to achieve high response rates to the questionnaires, so that a comprehensive picture of the development in libraries can be established.

The German library statistics for public and academic libraries have a response rate of ca. 90% per year.

year	2014	2015	2016	2017	2018
public libraries	91,8%	91,4%	91,2%	93,3%	91,6
academic libraries	74,8%	77,2%	73,9%	73,4%	72,8%
in total	91,2%	90,6%	90,5%	92,5%	90,8%

At first sight it surprises that the response rate of the public libraries is so much higher than that of academic libraries. The explanation is, that while the data input of the academic libraries is totally voluntary, the public libraries are more or less dependent for their funding on the "Fachstellen" – and these demand the statistics. Evidently, hoping for some kind of reward will further the delivery of statistical data.

A total coverage of the libraries in a country is probably unrealistic. But sometimes the existing data might be extrapolated in order to get complete datasets. ISO 2789 has an annex named "grossing up" that shows how to supplement the actual returns with estimates, either based on data of previous years or on comparison with data delivered by libraries of a similar type and structure.

Accuracy of the data: automated checks

The German library statistics use two ways for detecting errors and misunderstandings:

1. automated plausibility checks
2. intellectual control.

When the data is entered, the system automatically checks the plausibility. The library receives either the information that the data is correct or an error message, often with additional information.

The example shows input by smaller public libraries that have counted yearly opening hours, but did not give data for weekly opening hours. The system's error message is:

- The value (here 0) must be > 0

Library	Opening hours/year	Opening hours/week
	2018	**2018**
Public library Furth	329	0
Community library Neustetten	294	0
Parochial library St. Kosmas und Damian, Maikammer	133	0
Community library Dettenhausen	78	0

The library can correct the data until the end of the data input period
(March 31).

The system recognizes 10 plausibility types, of which the most frequently occurring are:

- missing: the value must be entered

- more than: the value must be greater than a comparison value

- less than: the value must be less than a comparison value

- sum: the value must result in the sum of 1 ... n other (subordinated) values (e. g. total acquisitions expenditure as sum of expenditure for books, journals, eBooks, etc.); the system indicates the resulting sum.

- the discrepancy amounts to more than 40 % compared to the previous year's figure

Accuracy of the data: intellectual control

When the data input period ends, the data are published in a preliminary form for all to see. The libraries can again check their data, perhaps detecting errors better by seeing the data in context and being able to compare with other libraries. For correcting items they must now apply to the editorial staff.

At the same time, the data checks of the editorial team and the "Fachstellen" start, based especially on a 40 % discrepancy from the previous year. The editorial team corrects data after contacting the library or the "Fachstelle" (such as number of FTE, part-time staff, number of service points, opening hours, etc.). There were 1678 contacts with libraries in 2017. If the library gives a coherent explanation of the questioned data, this is noted in the database of the editorial team, though the details will not be visible in the public online statistics.

After completing these data checks certain characteristics of the library must be controlled because they have an effect on the aggregated evaluations.

Example

Public libraries are divided into those with full-time management and those that are managed by volunteers or as secondary job. The definition is: "A library is managed on a full-time basis when the library management reaches an FTE value of 0.5 or more."

The editorial team compares the information in the address data (e. g. a handbook of libraries) with the information given in the statistics.

Comparison over time of the library's data and with data of other libraries will help the editorial team to detect errors.

Frequent errors in library statistics

Whenever statistical offices complain about the data delivered by libraries, the same blunders, errors or misunderstandings seem to appear. The following examples are taken from the above-mentioned publications, from a report about the statistics of the Chartered Institute of Public Finance and Accounting (CIPFA) and from the experience of the editorial team for German library statistics.

- *Collection statistics*
  The overall collection counts are often age-old; weeding data are not considered.

- *Lending statistics*
  Loans + renewals are often compared to initial loans only. In-house loans are often forgotten. Double-counting occurs in inter-library loans, which are checked out both at point of origin and delivery point.

- *User statistics*
  The number of registered users is too high, because rarely weeded.
  Visits are counted with inadequate methods, failing to halve the numbers from electronic door counters (as people enter and exit).
  Sampling is done on days with special events, skewing the visitor numbers larger.

- ***Facilities-based statistics***
  The definitions of "user space" vary. Differing opening hours in branch libraries are counted differently.
- ***Staff statistics***
  Number of staff as persons or as full-time equivalent is often miscalculated.
  What is a "professional"? This can vary very much over countries.
- ***All areas***
  Libraries forget to say "estimated", when they have given an estimate instead of an accurate count.

A main problem is that libraries don't give explanations for "odd figures" till they are asked. If a library suddenly has a threefold increase in volumes added, it might have added a footnote: We tidied up the storage in an attic and found wonderful things that we added to the collection.

If such and more errors appear in statistics for traditional services, even more problems can be expected when counting digital resources and services. For the usage of digital documents, for instance, libraries have to collect data from various sources, e.g. from the library's own servers, from various vendors, or from centralized services such as a digital library. Such data must be adjusted, as the definitions and contents of the data can vary, for example when one case of use can appear as download, hit, request, session, or access.

Can national statistics be error-free?

It is rather improbable that data aggregated from so many individual sources will ever be quite complete and correct. But they should be sufficiently reliable for identifying trends and the reasons for such trends.

John Sumsion clearly stated that there will always be garbage in summarized library statistics. But he also states that it does not really matter so much:

- "Many errors and shortcomings are of the sort that will tend to cancel each other out in totals and averages."
- "Consistency may be more important than absolute accuracy: data that is consistently wrong or incomplete from year to year will not invalidate the trends shown."

And on the basis of long experience he sums up:

"In general there is more reliability in the averages and large numbers produced by national statistics than can be expected when comparing their component parts."

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Not All OER Are Created Equal

How Different Approaches to OER Adoption Influence Deeper Learning

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Abstract

Advocates of Open Educational Resources (OER) argue that the adoption of these materials should have a positive impact on student learning. However, these arguments have paid little attention to potential heterogeneities in OER design, adoption, and implementation, which may in turn create varied impacts on teaching and learning in the classroom. In this study, we use an in-depth qualitative dataset to develop a new classification system for instructors' OER adoption, to discuss how these categories are more or less similar to the typical process of adopting of a new commercial textbook, and to explore how these distinct varieties of OER adoption influence classroom teaching and learning in quite different ways. We find that a "Hybrid" OER creation approach, in which instructors combine an array of existing OER content into a textbook-like backbone, has a particularly positive relationship with perceptions of teaching re-alignment and learning improvement.

Submission

Submitted to Open Access journal, so not included in Conference Proceedings.

Planning a new library building

Using assessment and data to transform spaces, services and collections

Ciara McCaffrey

University of Limerick

Abstract

Purpose

The new library at the University of Limerick opened in August 2018 and contains a varied of new spaces such as silent and group study, technology enhanced spaces, postgraduate and faculty rooms, a digital scholarship centre and data visualization lab, a special collections and archives reading room and a new one-stop services area. The library also contains an Automated Storage and Retrieval System (ASRS) with capacity for 500K books, the first of its kind in a European library. The new library was in the planning stages for many years and the library's strong record of assessment including user feedback, performance indicators, usage data and collection analysis contributed substantially to the planning and delivery of the building. This paper illustrates how library spaces were designed based on user feedback, how the ASRS was implemented based on detailed collection analysis and how new metrics are emerging from the transformed library which help to demonstrate the value that the new library has brought to the university.

Design, methodology or approach

This is a case study of library design which has been informed by many years of user feedback, performance indicators, usage statistics and collection analysis.

Findings

A strong record of assessment provided a bank of data which contributed to evidence-based planning of the building. The success can be measured by a substantial increase in user satisfaction levels with library services.

Research or practical limitations or implications

The UL experience will be of interest to those planning new spaces in their libraries, either through refurbishments or major building projects.

Conclusions

Since opening, the new library has seen a substantial increase in user satisfaction levels and has been highly successful and impactful in the university.

Introduction

The new library at the University of Limerick in Ireland opened in August 2018 and contains a variety of new spaces including silent and group study, technology enhanced spaces, postgraduate and faculty rooms, a digital scholarship centre and data visualization lab, a special collections and archives reading room and a new one-stop services area. The library also contains an Automated Storage and Retrieval System (ASRS) with capacity for 500K books, the first of its kind in a European library.

Planning spaces

The new library was in the planning stages for many years and the library's strong record of evidence-based decision-making was a key factor in the planning and delivery of the building. This evidence came in many forms and was brought to the design table by the Director of Library & Information Services, Gobnait O'Riordan, and the Deputy Librarian, Ciara McCaffrey, both of whom were on the New Library Building Project, working with the Dublin-based architects RKD and other university personnel. The building design was the culmination of a planning process that was strongly informed by international best practice, many years of user feedback, usage data and collection analysis.

The library regularly benchmarks itself against other university libraries internationally, whether through SCONUL or LibQUAL data or by identifying best practice elsewhere and introducing it into UL's library services. Whether we are implementing new services, technologies, policies or processes, our first port of call is to identify and reach out to libraries where these changes are already in place, to learn from their experience.

Evidence from abroad was the first very important driver in planning the new library. Library staff and the design team visited the newest, state-of-the-art libraries in Europe and North America which provided us with a bank of images and ideas on international trends in the delivery of new learning spaces in academic libraries. The visits yielded both examples of international best practice and 'would do differently' pitfalls to be avoided. Popular features in other new libraries were replicated in UL, such as breakout and lounge spaces, bookable group study rooms with audio-visual facilities, very popular group booths and noisy collaborative spaces, practice presentation and media production rooms, a variety of seating, desk styles and laptop tables.

User feedback was a second highly influential driver in the design of the new library. The LibQUAL survey has run every 2 years at UL since 2007 and the data strongly informs the library's planning and continuous improvement programme, outlined by McCaffrey (2019). From survey results since 2007, we built a large body of feedback on library spaces in terms of what works and what frustrates users. Both UL and international LibQUAL data indicated that effective quiet space for individual work remains a key priority for library users. The quite space question (LP-2) typically ranks highest among UL library users in the LibQUAL survey (McCaffrey and Breen, 2016), and is very highly prioritised by UK and Irish students as demonstrated in the SCONUL LibQUAL notebooks over the past decade (figure 1). This bank of evidence, together with years of experience dealing with noise issues, informed the planning of quiet space in the new library. Silent study areas were designed to be separate from collaborative spaces, the atrium and stairways are enclosed, carpet flooring is in study areas and acoustic management technologies are in place in ceilings throughout the building.
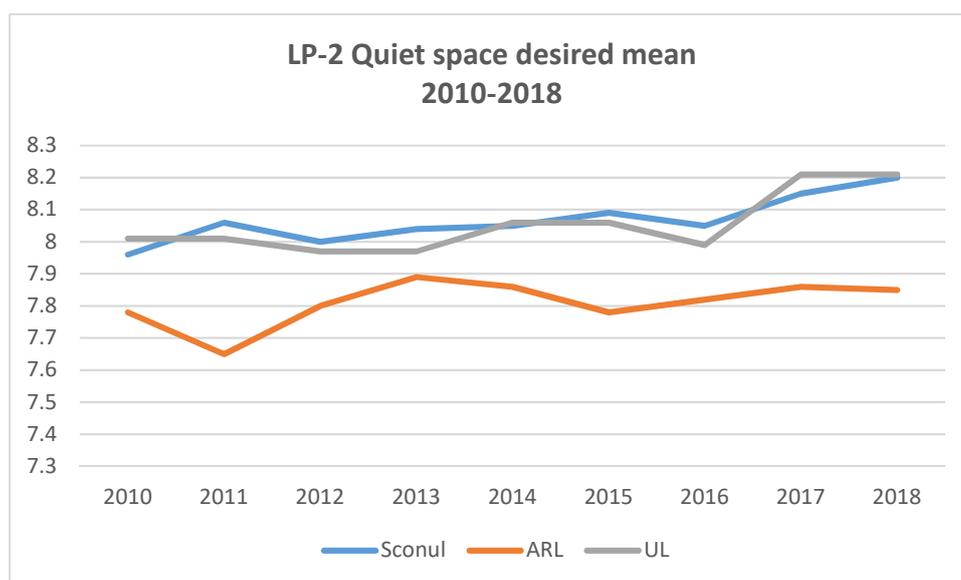

Figure 1. International comparison of LibQUAL quiet space desired mean 2010-2018 (LibQUAL notebooks, 2010-2018).

The need for group space did not come through in user feedback across the decade, the LibQUAL group space question, LP-5, was often ranked lowest in order of priority for UL users, based on desired means. While students had very high expectations around quiet space, conversely they did not seem to expect the library to provide space for groups to work together. However, staff observation of the small number of collaborate spaces in the original library which were in constant use, suggested a need for spaces where groups could work together on collaborative projects. This, together with international best practice and changing pedagogies such as flipped classrooms, problem-based learning and students as co-creators of learning, informed the inclusion of flexible, non-traditional, technology-infused learning spaces in the new library. Other top priorities informed by user feedback were power at study desks, excellent Wi-Fi, PC's, spacious workstations, water fountains, easy navigation and recycling facilities. The large bank of data gathered from survey feedback was very useful when working with architects, engineers and Buildings and Estates colleagues.

User feedback during the tendering phase of the new building was garnered through a furniture fair, where we invited students to sample different study desks and chairs and to give feedback on what they wanted most in the new library. While varied, funky seating was popular, the piece of furniture that was voted for most frequently was the traditional study desk with high partitions on three sides.

A particular benefit from the furniture fair related to feedback about the standard study chair that had been ear-marked by the architects as the likely one selected for the majority of study spaces in the library. Students gave feedback that a horizontal bar under the seat was so low that a person studying would not be able to tuck their legs under the chair. This feedback was invaluable and made perfect sense when observing how students sit at desks for long periods. They do indeed lean forward over the desk and tuck their legs under the chair. Without the furniture fair this small detail may well have been missed and might have resulted in quite a large difficulty for great numbers of library users. More generally, the furniture fair provided useful supporting evidence that supplemented librarian expertise and gave the architects an understanding of student priorities and expectations around libraries.

Planning collections

Anyone planning a new library will be faced with decisions around how much space to allocate towards collections versus seating. Assessment of collections' growth patterns and usage data can inform this decision-making, although when weighed against declining use of print collections and increasing electronic formats, there is an element of educated guess work. At 45 years old, the University of Limerick is relatively new, with a steadily increasing student population. The library print collections are therefore still growing in line with the development of new programmes, disciplines and research areas. This meant that we had to factor collection substantial storage and growth into the design of the new building.

The most common ways to store library print collections is via conventional open shelving or compact shelving. An automated storage and retrieval system (ASRS) presents a third option and has a much higher storage capacity, while occupying a much smaller footprint than the first two options. Instead of shelving, books are stored in large metal trays or bins. The bins are stacked vertically in a high vault and the depth of the bins vary to accommodate small, medium, large and oversized books. Material is therefore stored based on its size rather than a classification system and is identified by its barcode. When a user requests an item in the catalogue, a mechanical crane kicks into action, finds the right bin and brings it to the staff workstation at the base of the vault. The staff member then retrieves the correct book, sends the bin back, leaves the book at the reserve shelf and the user gets an email to say the book is ready for collection.

The decision to include an ASRS as part of the new library building at UL was made to meet two seemingly irreconcilable demands. We needed more seats for students and more storage for books. The original plan was that the new library would provide capacity for 260,000 volumes stored on shelving across all five floors. When the ASRS was proposed as a storage solution the architects calculated that it would provide capacity for 500,000 volumes on a footprint one ninth that of conventional shelving, allowing for a 25% increase in student space. So in essence, the ASRS provided more storage, more seats and more space than the original plan.

The project to implement the ASRS, or ARC as it is referred to in UL, required a high level of data analysis and evidence-based decision making, using collection analysis to identify low demand material to store in the ASRS. We defined 'low-demand' as books that had never been borrowed or been borrowed once and had been in the library for five, ten or fifteen years, depending on each subject. Use of material in our low-demand store was also analysed and a small number of items were returned to the open shelves, having been borrowed more frequently in recent years.

The ARC provides an evidence-based solution for collection management at UL well into the future. It contains one quarter of the library's monograph collection and still has plenty of space to accommodate material for many years to come. Open shelf material can be regularly weeded and moved to the ARC and items that are requested from the ARC more than three times are moved back to the open shelves. In future decades, if the ARC reaches full capacity, evidence-based decisions can be made on whether material that has never been requested from the ARC can validly be withdrawn from library stock.

Post-occupancy

Once the planning is over and the building has opened, assessment and evidence have an important role to play in post occupancy evaluation. Two months after the library opened in 2018 we ran the LibQUAL survey for the sixth time. Results indicated substantial increases in satisfaction levels particularly in the Library as Place dimension (figure 2).
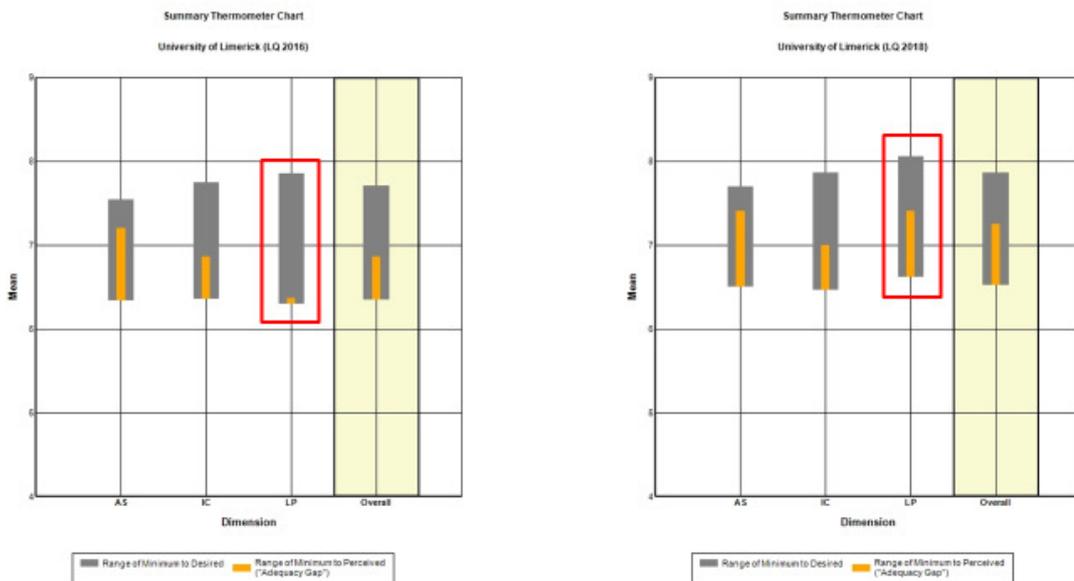

Figure 2. LibQUAL charts pre-new library 2016 and post-new library 2018

Retrospective analysis of surveys across the decade indicate that the greatest improvement in satisfaction levels was evidenced between 2016 and 2018, pre and post new building (figure 3).
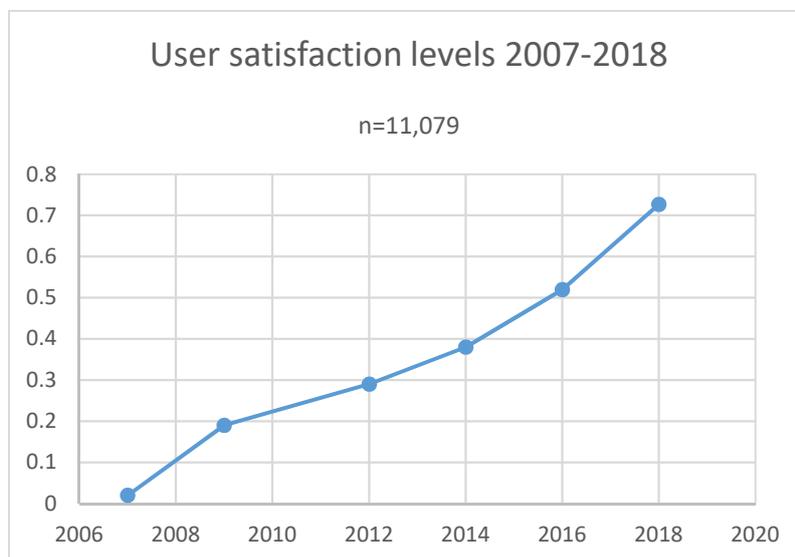
Figure 3. User satisfaction levels measured by LibQUAL adequacy mean 2007-2018

Performance indicators further illustrate the success and heavy use of the building: in the first year since opening, visits to the library increased by 31% to 1.06 million, the occupancy of bookable group study rooms reached 64% in mid-semester, and 19,322 bookings of group rooms were made. Unexpectedly, one figure that grabbed attention outside the library was the number of plastic water bottles saved by the new eco-friendly water fountains - over 400,000 in the first year. This, more than any other metric, gave a sense of just how popular and heavily used the library has become.

A programme of post occupancy assessment has commenced in the second year post-opening to review the effectiveness of the new spaces. Some UX-type notice boards have been used to gain understanding of user behaviours in some spaces, such as why do users prop open the swipe-access door in the postgraduate reading room, when for years they've been asking for swipe access! Further post-occupancy evaluation will focus student preferences around seating and in particular, on the highly popular group spaces, how users are interacting with them, what type of collaborative learning is taking place in these spaces, and so on.

Conclusion

Evidence, data and assessment were significant contributors into the planning and delivery of the new library at the University of Limerick. User needs based on many years of feedback were at the heart of the design while collection analysis informed the strategy for collection management. Pre- and post-occupancy usage data together with a substantial increase in user satisfaction levels confirms that the new library building has been highly successful and impactful in the university. The use of data, assessment and evidence has without doubt had a transformational effect on the development of library services at UL.

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Preparing the Academic Library Culture for Transformational Success

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Abstract

In 2016, the Ohio State University Libraries embarked on an ambitious project to re-envision its strategic intent and implement a new iterative operating framework incorporating participatory management practices and a nimbler approach to organizational planning and decision making – an agile operations and planning framework, or *agile framework* for short. The Libraries' purpose in implementing the agile framework was "to facilitate an ongoing conversation about its strategic intent and how it plans to move from intention to reality" by employing "a lighter-weight, open-ended process, allowing for increased flexibility and openness to unforeseen opportunities," with the goal of ensuring "the continuing integration of library faculty, staff, and external stakeholder voices into planning, management, and assessment discussions…"*

Much has been achieved in implementing the organizational processes that comprise the agile framework over the last two years, including the development and enactment of new procedures for proposing and evaluating strategic activities, the review and revision of an outdated committee structure, and the application of a lightweight, cyclical process for environmental scanning. Progress has been slower, however, in generating the transformations in organizational culture – and the behaviors it manifests – necessary to fully realize the promise of these technical and structural changes. Though ownership of the Libraries' strategic intent and enthusiasm for doing things differently remain high across the organization, a number of critical cultural/behavioral obstacles to success persist. The authors will describe what was learned from data gathering conducted through a series of organization-wide listening sessions and the administration of a 360-degree evaluation of the executive management team, as well as the steps taken as a result to prepare the organization culturally to successfully implement and leverage its new operating framework.

In response to significant informal feedback describing a marked disconnect between the organization's aspirations and progress in practice, the Libraries conducted an extensive series of listening activities focused on diverse cross-sections of the organization, with the goal of identifying structural, cultural, and behavioral impediments to success. Data was gathered from face-to-face listening sessions with middle managers, individual units, and from open discussions in both small- and large-group format. In addition, a targeted 360-degree evaluation of the executive management team was conducted, and an open-ended response survey designed to assess administrative effectiveness was provided to the entire organization. Data gathered from all methods were processed through facilitated activities that resulted in an action plan designed to address the specific cultural/behavioral obstacles identified.

Identified obstacles included the need to overcome deep-seated learned behaviors (i.e., somehow supplant previously rewarded behaviors with those in line with new expectations of active engagement, accountability, and risk taking) and to foster a growth-oriented culture where learning from missteps and manageable failures is expected, supported, and celebrated. In addition, members of the executive management team learned that some of their own behaviors were hindering the progress of change and reinforcing several legacy cultural norms.

From these findings, an action plan was assembled focusing on both developing shared understanding of and expanding individual and collective capacities in three key areas:

· Shared leadership

· Participatory decision making

· Process-oriented communications

The authors will discuss findings in detail, including preliminary indicators of progress; provide concept definitions; and share examples of the tools used to scaffold organizational learning and behavior change at both the operational and administrative levels.

Though both seemingly obvious in hindsight, two crucial insights emerged from this experience. First, an organization, in this case an academic research library, cannot expect success in implementing a significant technical or structural transformation without attending to its culture and the behaviors that comprise and reinforce it. Second, an organization cannot expect success in transforming its culture without clearly and repeatedly modeling and incentivizing the behaviors it envisions as constructive norms while deemphasizing rewards for those it views as unhelpful.

Many academic libraries are exploring new approaches to strategic planning and implementation, to support more efficient and effective operations, and to create more healthy, inclusive, and engaged workplaces. The authors are unaware of another academic library that has attempted to design and implement a similar planning and operations framework in support of these goals or has attempted to address the cultural and behavioral impediments to its success in this way.

*Jaggars, D. and Jones, D. (2018), "An agile planning and operations framework," *Performance Measurement & Metrics*, Vol. 19, Issue 2, p.121-126.

Submitted to an Open Access journal so not included in the Conference Proceedings.

Social Impace of Polish Public Libraries

Qualitative research instrument and preliminary findings

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Abstract

The aim of the paper is to present the quantitative research instrument of the social impact of Polish public libraries as well as findings from the study it was applied that took place in 2017 in one of 16 regions of Poland (Mazovia Province). I will also discuss how this part of study integrates with a qualitative study I conducted as part of my doctoral dissertation.

'Impact' and 'social impact' were defined according to ISO 16439:2014 Information and documentation - Methods and procedures for assessing the impact of libraries. I focused on informational, educational and participatory aspects of social impact on the sidelines leaving cultural heritage issues. I prepared and tested questionnaire to assess the social impact of public libraries. The research instrument included questions both about the activities taken in libraries by its users and the benefits they gained. It concentrated greatly on the experiences of a given user to avoid the third-person effect. The questionnaire also contains questions which allowed to control the variables such as frequency of using libraries, gender, age, financial situation and size of the household. Mentioned were found to be significant in many studies (a few cited in bibliography section). In another part of the research tool respondents were also asked about their cultural practices (using cultural institutions and using the media). This design allowed to test three main hypotheses:

H1. The social impact of public libraries depends on socio-economic factors.

H2. The social impact of public libraries depends on cultural practices' patterns.

H3. There is a relation between engaging in particular activities in public libraries and gaining particular benefits from using the libraries.

The study was preceded by pilot research and conducted on the group of 1098 users of 38 public libraries in Mazovia Province between February and June 2017. To describe dependencies I applied several analysis steps, including chi-square, regression of arithmetic mean and Spearman's correlation tests as well as exploratory factor analysis and linear regression.

The results of the study can be described as follows (in relation to research hypotheses):

Younger and people from smaller towns felt more benefits from using libraries. Older and lonely people were more likely to rest and feel pleasure thanks to libraries, and younger had access to the materials they needed and achieved better results in their studies or work. People with a worse financial status felt the benefits related to the possibility of using the devices more strongly. People living in larger households declared more often than lonely people that they gained skills thanks to libraries and that they were involved in social and cultural life.

People who went to libraries and other cultural institutions more often experienced more benefits. The use of cultural institutions and media did not, however, differentiate the group in terms of the type of benefits felt.

The more a person performs activities in libraries, the more benefits he or she has. Some added value of particular activities is also visible.

These general conclusions will be detailed in the paper.

Despite the efforts and the size of the sample, the sample is not representative of the population of library users in the Mazovia Province. This is mainly due to the data collection method – auditory questionnaire. Therefore while describing statistical dependencies I refer to the group of respondents and do not generalize to the population.

In addition, it would be interesting to include people who do not use libraries in the study, because current analyzes seem to suggest that there are differences between users and non-users of libraries (Bhatt, 2010; Sin & Kim, 2008).

The study is an initial step in assessing the social impact of libraries in Poland, but it allows to discuss the methodological aspects of this topic and to draw preliminary comparisons with the analyses carried out in other countries.

Studying the social impact of the libraries in Poland is still at its beginning. Some analysis took place as a part of the evaluation of Libraries Development Programme founded by Bill & Melissa Gates Foundation, and it referred to the assumptions and methodology of IPA. Presented research is, therefore, exploratory in terms of cognitive and methodological value.

This paper will be submitted to the Conference Special Issue of Performance Measurement and Metrics.

Space Use Over Time

Patricia Andersen

Assessment and User Experience Librarian

Arthur Lakes Library, Colorado School of Mines

Established in 1874 to train professionals in the mining and metallurgy fields to work in the developing mining industry in the foothills of the Rocky Mountains. The Colorado School of Mines is now a PhD granting university in various engineering fields including our heritage disciplines of Geology, Geophysics and Metallurgy. A library existed from the early years and was housed in different buildings on campus through the 1950s. Due to increased demand and a growing student population after WWII a new building was designed and built in 1954. The footprint of the Library was expanded in the late 1970s when the student enrollment had grown to 1687. This is the building we have now with a current student enrollment of 6268.

Purpose

The Arthur Lakes Library has a core of the 64-year-old building with a 1979 addition wrapped around the north, south and west and remains structurally unchanged in 2019. The original building held 5 floors of book stacks surrounded by three floors of user and staff spaces. The ceilings in the book stacks area are 7 ft. 1 in. (2.16 meters) high and contain structural supports for the floor above. The 1979 addition extended the four lower floors of stacks and created 2 mezzanines that overlook the first and second levels. Only the fifth level of stacks has a ceiling high enough to accommodate people and not violate building code.

The student population has grown, and user space is in high demand. A funding request was submitted to the State of Colorado in 2018 based on an architectural plan including internal structural changes to link the floors with a wide staircase from the 1st to the 2nd level and open up the interior, and a new entrance on the 1st level. There will be no extension to the current building footprint. The challenge is to look at the current use of the space and ensure that we provide for existing student needs with the renovated library, together with space for new programs, and the ability to preserve our unique and historic collections.

Methodology

Over the last 15 years, collections have been weeded, almost every book has been moved to facilitate growth, and some of the Library's exhibits have been relocated to the Colorado School of Mines Geology Museum, all to provide additional space for students and faculty.

In 2012, after a major weed of the print journals and relocation of the Reference collection we removed 4286 square feet of stacks (400 square meters) on the main floor of the 1979 addition. Any improvement such as adding power outlets into the floor or ceiling would require that the area be brought up to current building code. The area was redesigned with new carpet and low shelves were placed in the center to preserve the natural light from large windows on the north and south walls that had been obscured by the floor to ceiling book stacks. A mixture of comfortable chairs, tables and carrels were installed around the low shelving. This has proved to be a very popular space for study and relaxation.

In 2016, a new University Librarian was appointed and one of her early directives was to remove all collections from the public areas in the building. A collection of mining company reports housed in file cabinets was relocated to a storage room, 200 boxes of unbound School of Mines theses used for copying or digitization and a backlog of government publication material were all moved to storage. Moving these collections improved the appearance of student study space giving a less boxed-in feeling to a computer lab and enhanced the ambiance of a large study area on the 1st floor, however it did not create significant additional footage of study or meeting space.

Although the usual library statistics have been kept over the years: gate counts, checkouts and in-house journal browsing, it was time to develop creative ways to document activity in the Library.

1. A two-week observation in 2016 looked at use of furniture throughout the library, people occupying study spaces were noted on small floor plans with a view to evaluating the number and type of tables and carrels in use at different times of the day. This data was collected in late October and early November 2016. Our fall semester starts at the end of August and continues through the first or second week in December. The time was chosen because there were no scheduled breaks or mid-term tests. Data was collected at least once a day in the afternoon and in the evening around 10:00pm when possible.

2. LibQUAL+ Surveys have been administered every three or four years from 2003, results indicate a large gap between the perceived and desired levels of service in response to the five questions concerning "Library as Place".

3. Comments from the LibQUAL+ Surveys have been categorized at the conclusion of each survey and action taken where possible. The comments do give some very direct and candid information.

4. Headcounts are collected three or four times daily by floor and area. We began collecting daily headcounts for different areas of each level of the Library starting in 2017. This data is more telling for the number of people working in the Library than the gate count as the gate count includes students coming into the building for non-Library related classes or to buy coffee

5. A Program Plan was completed in 2018 for a structural renovation and submitted to the State of Colorado for funding. Input from all constituents was collected and space has been assigned for current seating and collection space.

Findings

New directions in student space needs has resulted in study space being given to multi-use purposes including undergraduate tutoring and small class meetings, a large study area was turned into two general classrooms for use when another academic building was closed for renovation. Library instruction sessions and staff meetings are held in one of the open study areas as are many of our outreach activities, these areas are closed off to students during events. It is unknown if the classrooms will revert to the library when the other academic building renovation is completed in August 2019. Ideally one of the classrooms will become the Library instruction space and open study after hours.

Removing the stacks and print journals on the second level of the addition has been a very successful increase in study space and compensates for the loss of the large study area to classrooms on the first floor.

Noise continues to be a problem due to the design of the building, staff offices are located on every full floor of the library so we are unable to offer silent study space. The mezzanines result in sound travelling between floors with only one quiet area on the top floor and smaller quiet areas governed by individual-use furniture arrangement.

1. 2016 Survey of Table and Carrel Use

Most of the study surfaces in the library are large 3' x 6' oak tables that seat up to six people or small individual tables and carrels, some of which were part of the original furniture purchase from the 1950s. There are 93 large tables and 82 carrels and individual use tables in the Library. When working on homework students tend to use at least half or all a large table. When collaborating on projects groups of four to six will work at one table. A survey of table use in 2016 showed the highest concentration of users with one person working at a 3'x 6' table, the second highest concentration was at the individual use tables and carrels. In the last weeks of the semester students are working to finish collaborative projects and we see an increase in the number of students seated at one large table. The use of all tables and carrels is influenced by the availability of power outlets, seating next to power outlets fills up first. At the time of the last renovation in the late 1970s outlets were added around the perimeters of large study areas and some were installed in the concrete floors of the addition, but they are insufficient for today's needs.
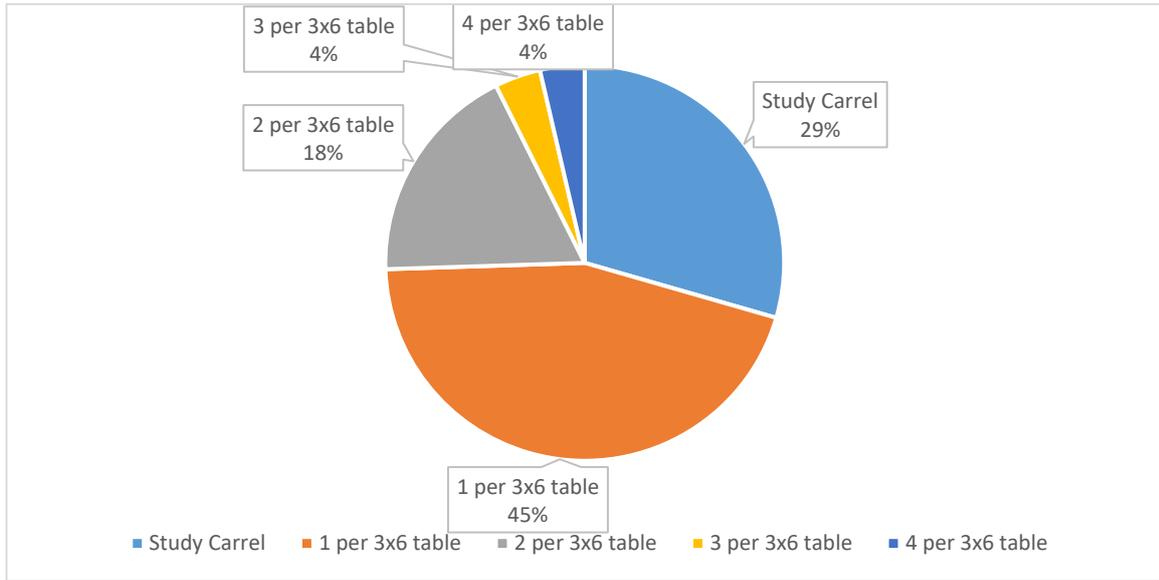
FIGURE 1
Number of people working at a Study Carrel or Table
in October and November 2016

1. *LibQUAL+ Surveys*

Reviewing the five "Library as Place" questions in the past three LibQUAL+ Surveys (2011, 2014 & 2018), the library is not seen as a quiet place to study. Ratings have dropped in 2018 for the questions "Library space that inspires study", "Quiet space for individual activities" or "Community space for group learning and study". Although ratings for the questions about "Comfortable and inviting location" and "Getaway for study, learning and research" ratings for 2018 compared favorably with early surveys levels they are still below desired levels.

FIGURE 2
Comparison of the "Library as Place" questions from LibQUAL+ Surveys
2011, 2014 and 2018

1. *Comments from the 2018 LibQUAL+ Survey*

The comments attached to our most recent LibQUAL+ Survey in 2018 indicated positive as well as negative comments. Comments such as cramped, uncomfortable, and prison-like referred to our study rooms which are all located in the 1954 part of the Library. There were many comments about the need for quiet as well as non-quiet areas. Students told us the building was dated and needed a renovation and many complained about the lack of power outlets throughout the building. Some comments offered suggestions on how to improve the furniture arrangement and many suggested more designated quiet areas.

2. *Daily Counts of People Working in the Library*

The daily headcounts showed no surprises. Attendance increases as the semester progresses, the 1st level has about 100 seats and the 2nd level 207 but the first level sees a higher percentage of use during the semester. The first level is quieter with fewer distractions from staff activity and students coming and going, and the main door is located on the second level. Of note is the lower count on the second level for February. The lower numbers may be related to numerous library events that were scheduled in one of the large study rooms on the second level.
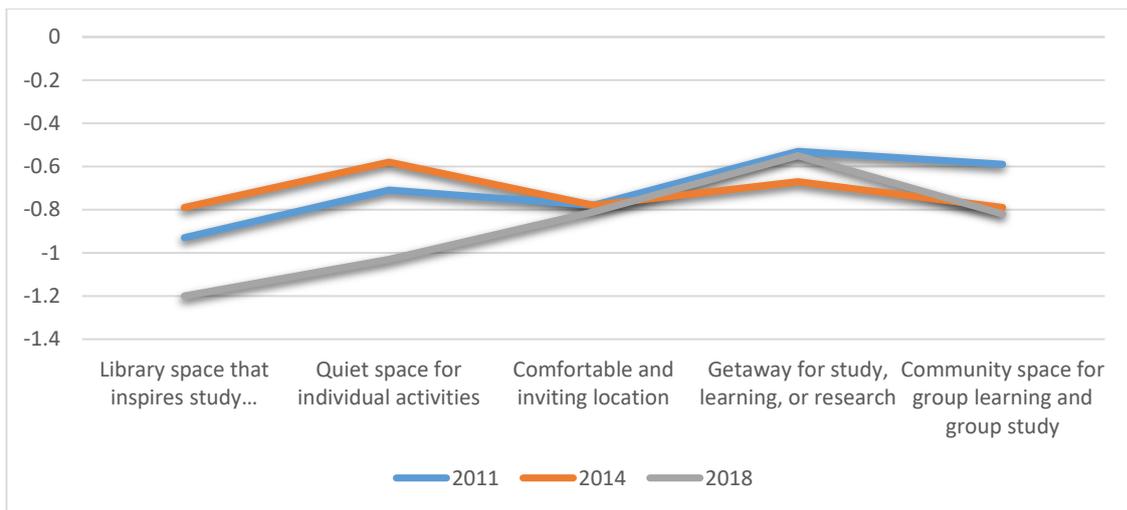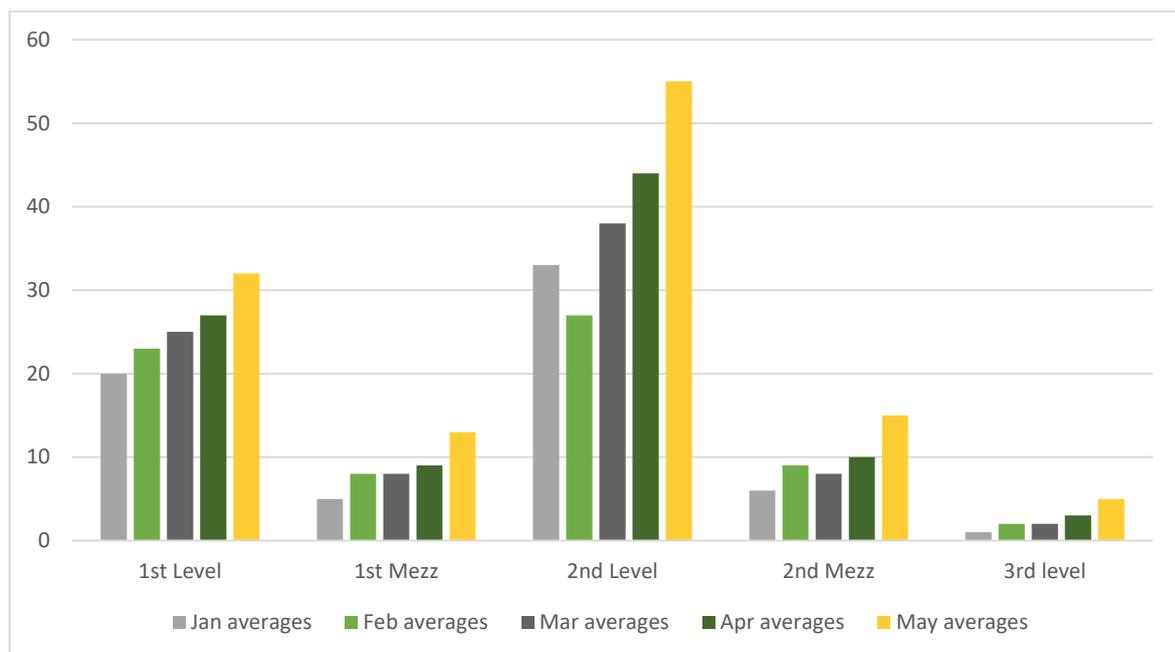

FIGURE 3
Average daily headcounts during Spring 2019 semester

1. *Program plan developed for the Library renovation in 2018*

The planned central staircase running from the first to the second level and an atrium on the second mezzanine level will remove approx. 5,000 square feet (464 square meters) of collection space with a plan to condense collections into other areas. The second level will be dedicated to student use with space on the first floor for graduate students and Library staff. Existing study rooms will remain, and additional study rooms will be distributed through the renovated areas. The stacks will be removed on the third level providing additional study and event space in this location with windows looking west to the foothills of the Rocky Mountains.

Benchmarking data provided by architects working on the Library Program Plan noted that staff offices and workspace occupy 15% of the total library space, other engineering universities in the US have less than 12% of their space used for staff and administration. The staff offices and processing areas will be consolidated on the 1st level to 6104 square feet (567 square meters) or 9% of total space.

Limitations

Knowledge of the building structure is important in planning changes to user space. The current building is lacking in electrical outlets and adequate ventilation, a renovation should include extensive improvements to infrastructure for all spaces. Staff offices are interspersed throughout the library and occupy more square feet than is currently allocated to staff in newer libraries. Consolidation of staff work area will take up less space and remove a lot of private offices which in turn creates a need for small group staff meeting space.

Going forward we should continue to log use of current furniture particularly the smaller tables and the carrels. It is important to look at table and carrel use throughout the semester particularly as mid-terms approach, group projects are due, and individual study for final exams takes place. One thing is clear, although study space is provided in new and renovated academic buildings on our campus the gate count for the Library continues to rise.

Future comparison of gate count and head counts after classes are finished for the day may give a more realistic picture of who visits the library for class and who stays to study.

Students change their study habits as their needs change throughout the semester, quiet study for exams or papers and group work for projects and reports. Flexible furniture can address this need, any new furniture purchased should be on wheels and one unit should accommodate one or two people.

Conclusions

Although students have expressed their preference for the large 3'x6' tables where they can spread out their laptops and books the reality is that we can no longer allocate large tables to one user. Smaller tables on wheels that can be placed together are a logical solution. Any furniture purchased in the last 10 years has been this type and works well for instruction, small meetings, and study space. Our speculation is that any temporary dividers on the large tables such as plants or glass or plastic dividers would be removed when interfering with student needs. These are engineering students.

This is an ongoing study as we move toward a renovation. We must provide the kind of study space the students need and include not just undergraduates but graduate students and faculty. As a 21st Century library we also need to include space for other functions in the library by continuing the services we provide now and adding new services expected by the modern user.

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The EZproxy Server – a workbench for the objective analysis of e-resources and their impact

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Abstract

OCLC's EZproxy is widely recognized as leading on access management for e-resources. In the process of validating library users requesting access to subscription-based resources from off-campus, the proxy server offers an additional and perhaps more powerful benefit for libraries. The log data generated from 'access events', offers a rich seam of intelligence, which can be analyzed and visualized to inform library staff in assessing the performance of content platforms, by:

1. Service providers are concerned about security and the vulnerability of their platforms to cyber-attack. EZproxy offers one of the most common ways for libraries to monitor suspicious activity. It provides the forensic data libraries need to establish whether an 'attack' on a publisher site is taking place and where it is coming from, by providing a single point of observation.

2. Libraries have expressed a need for greater insight into learning behaviors. Requests are centering around a need to understand user behavior such as usage by departments, user types, as well as when and how materials are being used in support of learning outcomes. The EZproxy server provides a workbench for investigating unambiguous, highly granular and objective usage information.

Academic libraries' preference for EZproxy is driven by the ability to maintain control of sensitive and meaningful usage data. Libraries have the capability to enhance patron privacy by aggregating usage, essentially de-specifying individuals while simultaneously identifying aggregated categories of use. According to the recently published LIILA project whitepaper ("Library Integration in Institutional Learning Analytics" sponsored by the Institute of Museum and Library Services) "learning analytics require an inventory of existing library data which would then contribute to the understanding and improvement of student learning and success initiatives."* [Oakleaf, 2018]

In 2019, OCLC has embarked upon a pilot for EZproxy Analytics with six institutions, three in the United States and three in Europe including the University of Manchester. Goals for this pilot, in collaboration with Couperin.org, are to enrich EZproxy log data to make it more useful in library analytics, provide an interface for query and export of transformed data, and to work with pilot libraries to establish goals for usage data and analytics in relation to the proxying and use of electronic resources.

The paper presented in this session will give an overview of the EZproxy Analytics pilot, the data transformations necessary to accomplish the goals of the pilot, and insight into library goals from the University of Manchester. Participants will come away from the presentation with a clear understanding of the work OCLC is doing to support learning analytics.

Details on this topic can be found Open Access on the [OCLC website](#), so not included in Conference Proceedings.

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The Learning & Research Dashboard: Making Data-Driven Decisions with Google Data Studio

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Abstract

Purpose

There is a growing body of literature focusing on the changing roles of liaison librarians within an academic setting. Insofar as these new roles are still being defined, liaison librarians need new ways of assessing their contributions, and leveraging the data they collect to improve service and inform their strategic direction.

This paper outlines the design of a live dashboard solution, using Google Data Studio, which has been tailored to the needs of liaison librarians.

Design/methodology/approach

This project identified key liaison librarians at the University of Miami Libraries, and then mapped and tracked their activities and responsibilities as a baseline for the design of an analytics dashboard. The resulting Learning & Research Dashboard was built with Google Data Studio, and created live connections to diverse data sources in order to provide a solution for data gathering, consolidation, and access. This project was designed to, a) empower library departments by displaying live data relevant to their activities, b) mine data to highlight achievements and identify areas for improvement, c) facilitate data access, and make its use routine, and d) build a culture of assessment.

Findings

The Learning & Research Dashboard has empowered liaison librarians to engage more fully with their data, and to begin interpreting data as a regular part of their library practice. The Dashboard encourages new insights by providing both a bird's eye view of the data landscape, and allowing them to drill down for a more granular view. The Dashboard has proven to be popular with the liaison librarians, and is both feasible and affordable.

Originality/value

Dashboards created with Google Data Studio provide an inexpensive way for Libraries to present vital information to internal or external stakeholders. Focusing on how this can benefit liaison librarians is a novel way to examine the overall value of dashboards.

"Submitted to Open Access Journal, so not included in Conference Proceedings".

The Library in International Student Life: A Holistic Investigation of First-Year Information Literacy Development

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Purpose

This study explores the holistic experiences of first-year international students during their transition to university study at a large US university, with an emphasis on understanding how students develop of critical thinking and information literacy skills. By analyzing qualitative and quantitative data from research practice interviews, "affective" maps of campus places and spaces, and outcomes of essay assignments, this study applies a mixed-methods approach to developing an understanding of the complex interplay between information literacy instruction, use of library resources and services, and characteristics of the first-year experience. Using findings from this multi-modal analysis, this study seeks to contextualize analytical indicators based on students' institutional records by developing a more nuanced understanding of students' academic contexts and identifying elements of the first-year experience that contribute to successful information literacy development.

Design and Methodology

Students were recruited using a random sample drawn from international students who were enrolled in a required first-year English composition seminar during the 2017-2018 academic year. 35 students agreed to participate in a series of two interviews and mapping sessions (one per semester) and 88 students agreed to provide their writing assignments for analysis. The students in this sample were principally from China, South Korea, and India, which reflected the international enrollment of the university.

Students participated in three research activities:

1. Research practice interviews: Students participated in a series of two semi-structured interviews asking them to critically reflect on their approach to an academic research assignment, the types of resources they needed, the tools and information sources they used, the search strategies they will use to locate resources, and the way they evaluated materials they found. Students were also asked to discuss their transition to campus life, including involvement in extracurricular activities and residential experiences.

2. Affective maps: Using campus maps and colored dots, students were asked to mark places where they had felt happy, sad, uncomfortable or out-of-place, and a sense of belonging. After completing the maps, students were asked to explain the context surrounding why they had felt particular emotions in the locations they marked and the activities they were participating in at the time.

3. Writing assignment outcome analysis: Student research essays were analyzed using a rubric assessing students' application of information literacy concepts. Essays were scored on a 1-4 performance scale ranging from satisfactory (3-4) to unsatisfactory (1-2) along five information literacy criteria: controlling purpose or thesis, critical use of sources, quality of sources, integration of sources, and documentation.

Findings and Conclusions

Overall, the diverse methods used in this study allowed the research team to develop a multi-modal understanding of international students' first-year experience, how they acquired information literacy skills, and they role the library played in these processes. In particular, affective maps allowed the research team to better understand how international students experienced library and campus spaces in relation to their academic, emotional, and social needs, and demonstrated that the library was a location where international students most often felt feelings of belonging. Throughout the research process

interviews, the research team was able to identify locations in students' academic practices where problems and difficulties developed and where they were in need of additional help. The rubric analysis of writing assignments indicated that only about half of the first-year international students satisfactorily met all the information literacy learning outcomes, suggesting that formal information literacy instruction is only partially meeting the needs of international students, and that additional interventions to support these skills are necessary.

Together, these findings indicated the centrality of the library in international students' first-year experience and helped the research team to reveal the contexts in which students worked and make effective recommendations for how and when library interventions might make the greatest contribution to students' information literacy skill and academic development.

The holistic approach utilized in this study therefore not only provides a more complete understanding the first-year experience of international students in relation to their information literacy development, but also can be used to help develop more nuanced data analytics based on real-life experience that may assist libraries both in supporting international students' adjustment to university study and their acquisition of the information literacy skills required to be successful in later courses.

Research Limitations

Because the design of this study drew only from international first-year students enrolled in a required English composition course, its findings are necessarily limited to describing that population and may not be generalizable to the broader international student body. Studies based on voluntary participation are also vulnerable to potential self-selection bias, and while the research team implemented sampling and recruitment procedures to ensure a representative group of students, the design of this study does not allow us to guarantee the findings fully represent the diversity of international students' experiences. Finally, due to privacy constraints the research team was not allowed to directly link participants in the assignment analysis to participants in the interviewing and mapping activities, which puts practical limits on some the quantitative inferences provided by the rubric analysis.

Originality and Value of the Proposal

Few studies focus exclusively on providing a holistic understanding of the interrelationship between first-year international students' transition to university study and information literacy development. Additionally, international students' specific needs for effective acquisition of research and writing skills are presently understudied in the context of library services and resources. This mixed-methods study provides both a detailed case study for understanding how the library fits into international students' academic practices and can contribute to their successful information literacy development, and also demonstrates a model for synthesizing quantitative and qualitative data into an effective analytical argument. Finally, the multi-faceted characteristics of international students' first-year experience identified by this study can be used as an analytical framework for potentially predicting international students' success in relation to information literacy and critical thinking development.

Submitted to Open Access journal, so not included in Conference Proceedings

The Student–Researcher Conflict: Student goals, motivations and frustrations at the University of Cambridge

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Introduction

The 'Student-researcher conflict' was a concept arrived at by Cambridge University Libraries' Futurelib programme (Futurelib) during the (October 2017 to May 2018) Futurelib 'Student Learning Journey' project. It conceptualises a key observation from that project; when analysing the project data the Futurelib team became aware that a conflict existed for many Cambridge students between having to devote large amounts of time and mental energy towards learning for formal assessment activities such as exams and wishing to learn more about research skills and practices that they might apply during research study and careers within Higher Education.

This paper introduces the student-researcher conflict, the Student Learning Journey project research that led to its development and the opportunities it has provided for attention and response, in and outside of Cambridge libraries.

The Futurelib programme

Cambridge University Libraries' Futurelib programme employs qualitative research methods and user-centred design techniques to arrive at opportunities to improve the user experience of Cambridge libraries and their services. A key focus of the work conducted by Futurelib is on moving beyond the library walls, literally and metaphorically, to explore how library services can be designed, developed and tailored according to the needs and approaches of their users. Futurelib projects range from in-depth, exploratory research projects to targeted User eXperience (UX) exercises. They tend to explore a specific aspect of library service, or the experiences of a user group.

The Futurelib Student Learning Journey project

The Student Learning Journey project consisted of an in-depth, qualitative research exercise, aiming to explore the experiences, behaviours, attitudes and approaches of undergraduate and taught-postgraduate students at the University of Cambridge. Methods included *ad hoc* interviews, comment cards and feedback walls, along with more in-depth techniques including a 36-participant, 3-week digital diary study and over 20 extended interviews, each lasting between 45 and 75 minutes.

There was a focus on exploring the needs and experiences of students in the STEMM (Science, Technology, Engineering, Mathematics and Medicine) disciplines, as well as of students who, for Cambridge, could be considered non-traditional, for example part-time and distance learners and students who had returned to study in Higher Education after time spent in the workplace or pursuing different life activities.

Concurrent with the Student Learning Journey project, work was being undertaken by CILN (Cambridge Information Literacy Network) to develop an Information Literacy Framework for the University of Cambridge libraries, as well as the provision of information literacy teaching and training to accompany that framework. The Futurelib project therefore placed an emphasis on uncovering student experiences and approaches related to academic skills and information literacy.

During the Student Learning Journey project the Futurelib team spent time with students exploring their goals and motivations, i.e. what kept them determined to work on a day-to-day basis, as well as what they were trying to achieve during their time at the University of Cambridge. These questions were framed broadly and holistically; the team were keen to capture what motivated students in the widest sense possible, including, but not limited to, their academic successes and ambitions.

Working with students in the sciences

For a number of reasons, including key strategic activity at Cambridge University Libraries at the time of the Student Learning Journey project, the Futurelib project team focused on working with students in STEMM, particularly in the natural sciences. This was realised through these students participating in the three-week diary study conducted as part of the project, as well as in *ad hoc* and in-depth interviews. The insights from this work fed into projects scoping the information needs of the University of Cambridge Schools of Physical and Biological sciences, as well as informing the findings of the Futurelib Student Learning Journey project.

The student-researcher conflict

During the in-depth interviews conducted as part of the Student Learning Journey project, student participants were asked to outline their motivations, in terms of what allowed them to keep working and producing what was required of them as part of their studies, as well as their long-term goals and ambitions, i.e. what they intended to achieve during their time at university and after their taught course programme. Responses to the latter question varied greatly; for some students, the primary goal was achieving exam results and grades that would allow them to embark on their chosen career; for those who were considering further studies and careers in academia, developing research skills and practices, as well as learning more about what a career in research and academia involved, was the primary goal.

Many of the students who were considering further pursuits within Higher Education saw a direct conflict between the work they knew they would need to do to pass their exams and assessment and the desire to develop research skills and an understanding of the research lifestyle. The Futurelib team dubbed this the 'student-researcher conflict'. A key aspect of this conflict for students was that they knew that they could only progress to the next stage of their journey within academia, namely research study, by achieving certain grades in their taught course assessment, but felt that this left them little time and mental space to engage with what would also be vital in this progression: knowledge and experiences of the skills and activities needed to be a researcher. This was especially true of students in the STEMM disciplines, particularly the natural sciences, although the conflict was present to an extent across the students who participated in the project from both STEMM and AHSS (Arts, Humanities and Social Sciences) disciplines. Factors involved in this conflict for students can be outlined and described as follows:

Learning how to be a researcher	Being a 'successful Cambridge student'
Pursuing internship opportunities	Reading and studying broadly, with a low level of depth
Working with PhD students and academic staff to find out about their research	'Skimming' the information necessary to complete assignments and do well in exams
Seeking out 'extra' sources of information, particularly academic articles/papers	Spending equal amounts of time on each topic and assignment
Studying particular topics in depth when they are of interest	Making sure essays and other assignments are passable, without much care and attention
Aiming to gain knowledge and skills that can be applied throughout a career in academia	Aiming for good grades, with the immediate aim of getting a good job after graduation
Looking for further training opportunities	Looking for 'in the moment' training for the current task or activity

[Table 1. Aspects of the student-researcher conflict]

One of our natural sciences students directly mentioned this conflict and the desire they had to develop research skills and practices that they could use at PhD level and during careers in academia:

"My current, sort of, main goal, is to become a good researcher and to go into academia, at least to try it out. […] Becoming a good researcher, a good scientist, is fairly far from getting good results in exams. There is a little bit of overlap between the two worlds, but it's not really that much. But, at the same time, to keep continuing, and going to […] higher education, you do need those results." *(2nd year undergraduate Natural Sciences student)*

We worked with students studying medicine who expressed a similar conflict, albeit the difference between performing well as a Clinical Medicine student and what they saw as the knowledge and skills development necessary to begin to become a good doctor. For these students, the conflict revolved around the masses of information they needed to learn to pass exams and the value they saw in spending time on wards with patients, to develop as practitioners.

The Cambridge context

Much of the motivation for the work carried out by the Futurelib programme is in understanding the needs and experience of the users of library services at the University of Cambridge. This means that the findings of Futurelib work are dependent on this context to an extent. In the case of the student-researcher conflict there are factors present for students at Cambridge that will have informed this concept, and we are aware that it may be more prevalent at Cambridge than at other institutions.

Factors include:

- Cambridge is a research-intensive university, so it is natural that many taught students will be considering pursuing research study or careers in academia.
- In areas such as the Natural Sciences, but to an extent across all undergraduate programmes, the nature of teaching and learning at Cambridge means that students are often asked to study a wide range of subjects in a short space of time. This adds to the feeling for students that they are unable to explore topics that are of interest to them in as much depth as they would like.
- Particularly in the sciences, Cambridge relies heavily on exam-based assessment. This means that to achieve the grades necessary to consider further study, students feel that much of their time is directed towards learning and revising for these assessment activities.
- Cambridge undergraduate terms are comparably very short in length. Undergraduate students at Cambridge are 'at University' for roughly half the calendar year, with terms lasting approximately eight weeks.

Understanding the student experience

The ethos of the Futurelib programme is that it is essential to understand as much as possible about the experiences of students and other library users, in order to be able to develop and provide services and opportunities that are meaningful and valuable to those people. It is the case however, that this needs to be balanced with the knowledge and experience that practitioners such as teaching academics, course administrators and librarians bring to an institution. In this case, the argument is not that Cambridge students should re-design the way a Cambridge education works but that it is vital to understand their experiences and perceptions related to that education in order to be able to respond in a way that sees benefit for both students and the other parties involved.

It may be the case that Cambridge students who feel that they are not developing research skills and practices in the way they see necessary are in fact developing those skills and practices. However, a mismatch between student perception of skills development and actual development is still important and an area that needs investigation and attention.

Implications for Cambridge library services

The nature of the Futurelib Student Learning Journey project meant that research work focused on the broad experiences that students have of studying at the University of Cambridge. The work did, however, provide some key insights that led to considerations about how Cambridge libraries and their services could best respond to and support aspects of the student experience, as well as an understanding to inform strategic activity on the part of the libraries.

One opportunity arrived at during the Futurelib team's analysis and idea generation workshops was the concept of 'Student Summer Bootcamps'. These would be device-friendly MOOCs (Massive Open Online Courses aimed at Cambridge taught

students and introducing research skills and practices, particularly those related to working with information and data. The MOOCs could repurpose content already made available by Cambridge libraries to support the research community, tailored to the needs and approaches of taught students. This opportunity, along with others identified by the project team, was presented to Cambridge University Libraries' Leadership Team and at the time of writing is under consideration for development.

The Student Learning Journey project, along with initiatives such as the Cambridge Information Literacy Network and Framework, has led to increased visibility and reputational advantage for Cambridge libraries within other areas of the University of Cambridge. The libraries are continuing to develop as a key and respected aspect of the provision of teaching and training to students across the University.

Conclusion

The findings of the Student Learning Journey project and the opportunities they provided for meaningful response on the part of Cambridge libraries validate the approach taken by the Futurelib programme; it is only by endeavouring to understand the needs, experiences and perceptions of our users that we are able to provide services that are valuable to them.

Although the conflict for students outlined in this paper may be exacerbated for students at the University of Cambridge, we believe that this may also resonate with those working in academic libraries and elsewhere in higher education.

The full Student Learning Journey project report and other outputs can be found alongside those from other Futurelib projects at the Futurelib webpages: http://www.lib.cam.ac.uk/futurelib

The use of remote, digital contextual enquiry through the mobile app 'dScout' in the Futurelib 'Student Learning Journey' project at the University of Cambridge

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Introduction

The dScout (https://dscout.com) mobile-responsive contextual enquiry tool has been used by Cambridge University Libraries' Futurelib programme (Futurelib) in a number of research and design research exercises between 2016 and the present. This paper covers the use of dScout by Futurelib in the 'Protolib II' and 'Student Learning Journey' projects. It introduces other contextual enquiry 'diary studies' conducted by Futurelib, using various analogue and digital tools and products. It focuses on the value of using such tools and methods as a way of recording participant reflection on their activities in the moment or directly after they happen.

The Futurelib programme

Cambridge University Libraries' Futurelib programme employs qualitative research methods and user-centred design techniques to arrive at opportunities to improve the experiences users have of Cambridge libraries and their services. A key aspect of the work conducted by Futurelib is moving beyond the library walls, literally and metaphorically, to explore how library services can be designed, developed and tailored according to the changing needs and approaches of their users. Futurelib projects range from in-depth, exploratory research projects to targeted User eXperience (UX) exercises. They tend to explore a specific aspect of library service, or the experiences of a user group.

When conducting research the Futurelib team are often seeking to balance attitudinal data with behavioural data, i.e. recording what people say, alongside what they do. The remote contextual enquiry tools and mechanisms introduced in this paper, such as dScout, are aligned to this approach.

dScout

The dScout tool and mobile app allows researchers to design and customise their own 'missions': the word dScout uses for 'project' or 'study'. These can be constructed with aspects such as textual information and prompts, media upload options, as well as locally designed questions with free-text response options and sliding scale quantitative measures. 'Scouts' (participants) can be recruited by researchers from a local population and invited to these missions by the researcher through their dScout account, and the time frame for a mission can be set by the researcher, for example over a number of days or weeks.

Once a scout has registered for a mission using the dScout mobile app, they are able to log in and make entries at any point that the mission is open. The dScout tool is very user- and mobile-friendly and compatible with iOS and Android devices.

To make a mission entry using dScout, scouts work through a sequence of mobile screens within the app, each representing a prompt, upload option or question. When the entry has been made, a scout is notified within the app interface that their entry has been completed and logged.

The benefits of remote contextual enquiry

Tools such as dScout allow researchers to capture in-the-moment activity, and allow research participants to record and reflect on their experience as they happen, or immediately after they happen. The benefits of these tools are similar to those of shadowing participants in person as they conduct their day-to-day activities; however, using a remote contextual enquiry tool to achieve this is far less onerous and resource-intensive for the researcher, or researchers. An added benefit is that participants tend to forget that a researcher is recording the activity and will be analysing the data, eliminating a level of self-censoring on the part of participants that may happen during in-person shadowing.

Media upload options and prompts that ask participants to record their current activity represent a powerful opportunity for gathering behavioural evidence, i.e. recording what people do. The option to ask specific questions tailored to the research question also mean that this can be balanced with gathering reflection from participants, who can be prompted to think about and detail emotional responses to situations, as well as asked to reflect on specific aspects of that experience.

Use of dScout in the Protolib II project

The Futurelib 'Protolib II' project was concerned with aspects of site- or campus-level library environment design. Following the first Futurelib 'Protolib' project, which aimed to arrive at a set of user-centred design patterns for physical library spaces, the Futurelib team explored with users what space provision might be needed across the geographically dispersed sites at the University of Cambridge.

The Futurelib team constructed a mission using dScout that asked scouts to record entries when they were studying, within or away from the University estate. Scouts were asked to upload a photo or video of the space in which they were studying, to outline the study activity they were conducting, why they had chosen that space to approach this activity, who they were with and to outline any emotional responses to their current situation. The mission was conducted over 21 days with 41 participants, from a variety of academic disciplines and stages of study.

The use of dScout and remote contextual enquiry during this project provided the Futurelib team with a deep level of knowledge in terms of what study activities Cambridge students were conducting in various environments and why, as well as broader insights into student attitudes, needs and experiences related to space and how these impacted on their day-to-day lives at the University. Along with the findings of the first Protolib project, this knowledge has fed into considerations around space planning at the University of Cambridge, in and outside of libraries.

Use of dScout in the Student Learning Journey project

The Futurelib 'Student Learning Journey' project (October 2017 to May 2018) was an in-depth, exploratory, qualitative research exercise that aimed to explore the experiences of undergraduate and taught-postgraduate students at the University of Cambridge. In addition to this broad aim, the project focused on aspects of the student experience related to library service provision. A specific area of interest for the Futurelib team was in student experiences and approaches related to academic and information literacy skills and practice. This focus was to support work being conducted by CILN (Cambridge Information Literacy Network), who were in the process of developing and Information Literacy Framework for Cambridge libraries, as well as developing the provision those libraries offered to students in this area.

The Futurelib project team constructed a dScout mission that allowed scouts to record and reflect on their study activities, self-directed or otherwise, particularly in terms of the underlying academic skills and practices those activities required and involved. Scouts were asked to make entries during self-directed study events and as soon after scheduled study events such as labs, lectures, seminars and supervisions as possible. A focus was on exploring how student participants felt about the underlying academic skills required of them to complete tasks they were set as part of their studies, including how equipped they felt in these areas.

As well as providing broad insights into the experiences of taught students at the University of Cambridge, the Student Learning Journey dScout mission provided the Futurelib team with data that could be analysed to explore student perceptions, experiences and approaches related to information literacy. The CILN Information Literacy Framework is divided into four strands: Resource Discovery; Managing Information; Critical Assessment; Creating and Communicating. An analysis was conducted of the dScout mission data based on these themes, exploring the experiences of students at undergraduate and taught-postgraduate level, in the STEMM (Science, Technology, Engineering, Mathematics and Medicine) and AHSS (Arts, Humanities and Social Sciences) disciplines as they related to each strand of the Framework.

Using the Qualtrics platform for remote contextual enquiry

From October 2018 to March 2019 Futurelib conducted a project, 'Developing the accessibility and inclusivity of Cambridge library services'. The project focused on exploring the needs of library users with disabilities, endeavouring to uncover insights related to the experiences of these individuals, focusing on research conducted with students at the

University of Cambridge who had identified to the University as having a disability. Alongside other methods including an online survey and in-depth interviews, the Futurelib team conducted a two-week diary study with eleven student participants.

For a number of reasons, including concerns around data security and participant protection, as well as the desire to create a research mechanism that was as accessible and inclusive as possible, the Futurelib team chose to construct a remote contextual enquiry mechanism using the Qualtrics (https://www.qualtrics.com) platform. The University of Cambridge Qualtrics instance is recommended by the University due to its high levels of data security. Qualtrics provides an intuitive and user-friendly mobile experience, although being web rather than app based, and is also very accessible (for example, in terms of screen reader-compliance, which was essential for this research exercise).

The functionality within Qualtrics allowed the Futurelib team to construct a remote contextual enquiry mechanism that replicated the missions previously conducted using dScout during previous Futurelib projects. Participants were given a link to a URL that held a Qualtrics survey that was individual to them and that they could respond to an unlimited number of times. This helped to create a more seamless and intuitive experience for participants, as well as ensuring that data received was as anonymised as possible during the research. The Futurelib team were able to link survey responses gathered through these anonymised links to individual research participants using a locally stored mechanism.

Using the Qualtrics survey tool as a remote enquiry mechanism brought both benefits and drawbacks. Using a survey link rather than a self-service app meant that the researchers prompted participants each day via email that they should use their individual link to record and reflect on their activities that day, although it was made clear to participants that they should not let this option interfere with their own schedule and work times. This was beneficial in comparison to expecting participants to autonomously remember to make entries using an app, and yielded more entries and data than had been the case in previous, app-based studies conducted by Futurelib. The Futurelib team were able to use the University of Cambridge Qualtrics license, which meant that the contextual enquiry mechanism did not have to be paid for. Disseminating the survey to participants each day was challenging; due to technical issues with scheduled emails and similar approaches, the Futurelib team had to email each participant on the morning of each day of the study.

Analogue contextual enquiry and cultural probes

During the 'Snapshot' project, which investigated the experiences of research students and postdoc researchers, the Futurelib team used an analogue, paper diary to conduct contextual enquiry, as the core element of a 'cultural probe' kit. The diary asked participants to reflect on their research activities each day, as well as asking for responses to specific questions over the course of the study. Alongside the diary, amongst other activities, participants completed a photo study outlining their experiences of Cambridge as a university and a city and a remote cognitive mapping exercise outlining their experiences as Cambridge researchers.

Exit interviews

After each mission or diary study mentioned in this paper, the Futurelib team conducted a series of in-depth exit interviews with all, or a sample of, the participants. This allowed the project teams to explore areas of interest that had arisen on analysis of the data from a participant's mission or diary study, as well as providing an opportunity to cover areas of that individual's experience that had not been illuminated through the mission or diary study itself. This approach added to the richness of the attitudinal and behavioural data gathered as part of these projects and ultimately to the depth of insight and clarity of findings.

Research ethics and data privacy and security

Contextual enquiry tools are a powerful way of illuminating and exploring the lives of users, which can provide invaluable insight when considering library service design and delivery. They do, however, represent an intrusive way of conducting research and should therefore only be used when the data and insight they yield are sufficient to warrant the approach. Participants should be informed of and made aware of the voluntary nature of their participation throughout the exercise and it should be reiterated to them that they have the right to withdraw from the exercise at any point, without giving a reason. It

should be clearly outlined to participants what they are expected to record, why the data is needed and what it will be used for. Formal ethical consent should be sought before conducting any research of this nature.

It is important that any tools used for this type of enquiry are compliant with GDPR (General Data Protection Regulation) legislation. If compliant, serious consideration should be given to whether a tool can be used in conjunction with the ethical standpoint and guidelines an institution has on data privacy and security.

Conclusion

The dScout tool has provided the Futurelib programme with the opportunity to explore the experiences and behaviours of Cambridge library users on a number of occasions with a relatively low level of resource. The Futurelib team have also had success conducting remote contextual enquiry using other digital and analogue tools and techniques. The data and insights yielded by these exercises, supported by data gathered during interview and through other methods, have been invaluable in informing the development of Cambridge library services that are tailored to the needs and experiences of their users.

The full project reports and other outputs from the Futurelib projects referred to in this paper can be found at the Futurelib webpages: http://www.lib.cam.ac.uk/futurelib

Understanding STEM and Health Sciences

faculty and graduate student needs

Research workflows and library impact

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Introduction

This paper reports on the first phase of a year-and-a-half-long, mixed-methods assessment project focused on exploring the needs of University of Washington (UW) Science, Technology, Engineering, and Math (STEM) and Health Sciences researchers and the impact of the UW Libraries on their research. The goal of this project, which began in January 2019, is to gain a better understanding of the research lifecycle, current research trends, and the library's impact on research in these fields.

The project is driven by a number of guiding questions:

- What are the key elements and challenges in faculty and graduate student research practices and workflows in these fields?

- How do these practices and workflows vary based on stages in academic career/program?

- What sources of support are available at various points of the research lifecycle, and how might the Libraries partner with others to enhance research support?

- What is the impact of library services and resources on the work of STEM faculty and graduate students?

- How have research workflows and use of library information resources and services changed during the past ten years, and what are the implications of these changes for the Libraries?

- What role can the Libraries play in the communication and dissemination of research information?

This paper will explore results from the first phase of the project – a Spring 2019 survey distributed to all faculty and graduate students in the targeted fields – and then go on to highlight how subsequent phases will build on these results to create a more detailed understanding of research needs and library impact.

Institutional Context & Background

The UW ranks in the top three U.S. public universities in external research funding ($1.35 billion in 2017-18), with internationally recognized research programs in the Health Sciences and STEM disciplines. In line with national trends in the U.S., there has been a significant increase in the number of graduate degrees awarded in STEM fields at the UW (University of Washington Office of Planning & Budgeting, n.d.), and the UW has over 290 research centers and institutes that emphasise interdisciplinary and multidisciplinary approaches, the majority of which are in Health Sciences and STEM fields (University of Washington Office of Research, n.d.).

Wider conversations about the changing nature of research, scholarship, teaching, and learning are also taking place at the UW. In Spring 2018, the University Faculty Senate passed an Open Access Policy and charged the Libraries with leading the policy implementation. In addition, a recent report produced by the University's faculty governing body established a number of aspirational strategies for faculty and the institution, including "establish[ing] robust support for faculty-led community engaged, collaborative, interdisciplinary, and/ or public scholarship, research, and teaching" and "formally

recogniz[ing], valu[ing] and reward[ing] commitment to community impact within research, scholarship, teaching, and service" (University of Washington Faculty Senate, 2018). Telling the story of the impact of research and scholarship conducted at the University of Washington is a key goal for the institution, as set out by UW President Ana Mari Cauce in a 2018 address to the University. In line with this institutional emphasis, a core set of goals in the 2018-2021 UW Libraries strategic plan is focused on "Advancing Research for the Public Good." Specific goals include increasing support for the entire research lifecycle and assisting researchers in demonstrating the impact of their scholarship.

In additional to these wider institutional developments, Libraries-specific data from recent years also highlighted areas that required further exploration. The UW Libraries has conducted major surveys of faculty, graduate, and undergraduate student needs since 1992. Results from the 2016 UW Triennial Survey and subsequent assessments prompted many of the questions we are exploring in this current project. Data from the 2016 Triennial Survey, for example, indicated a decline across the board in ratings of Libraries contributions (University of Washington Libraries, 2016):

- For graduate students, the biggest decrease was in the Libraries contribution to achieving overall academic success.

- For faculty, the biggest decrease was in the Libraries contribution to their ability to be more productive researchers.

There was also a decline in faculty and graduate student satisfaction with the Libraries, with some notable declines in STEM and Health Sciences fields. For faculty survey results, the decline in both contribution to research productivity and satisfaction pointed to the need to learn more about potential ways the Libraries can support research. While we followed up on 2016 survey results through a number of targeted qualitative assessments, we also felt that it was important to continue to gain a deeper understanding of researcher needs in light of the recent institutional developments outlined above. It should be noted that although we decided to begin with STEM and Health Sciences as areas experiencing some of the greatest growth and increasing complexity (e.g., in interdisciplinary and collaborative work), our hope is that this approach can be extended in future to other broad disciplinary areas such as Social Sciences and Arts & Humanities.

Literature Review

The nature of academic research and scholarship is evolving rapidly (Long & Schonfeld, 2013; Tancheva *et al.*, 2016), and libraries are continuing to seek new ways to provide services to support emerging needs and to develop their role from one focused on research support to more collaborative partnerships (Hollister and Schroeder, 2015, p. 99; Case 2008). Brown and Tucker (2013), in their survey of faculty at the University of Nevada Las Vegas, note that some faculty may not be ready for librarians to play a more active role in research, often conceiving of library support primarily in terms of more traditional functions such as collections and discovery (p. 288). Gaining a better understanding of faculty and graduate student needs throughout the full research lifecycle has emerged as a key strategy for libraries to develop services, resources, and spaces that are relevant to current and future research practices. Accordingly, a number of studies have focused on how libraries might align their work with the full research lifecycle, including developing models of the lifecycle to pinpoint more precisely where libraries might be able to leverage their expertise and resources (Gessner *et al.*, 2017; Brewerton, 2012; Raju and Schoombee, 2013; Wiklund and Voog, 2013; Falciani-White, 2016; Vaughan *et al.*, 2013).

In literature focused on faculty research needs in STEM and Health Sciences fields, a number of clear themes emerge, including the challenges of working in a complex information environment and concerns about keeping up to date both in primary research fields and related fields (Long and Schonfeld, 2013; Gordon *et al.*, 2018); the nature of research in increasingly collaborative, team-based, multi- and interdisciplinary contexts (MacKenzie, 2014); and the needs for support in areas such as scholarly publishing (Zoellner *et al.*, 2015), research data management (Monroe-Gulick *et al.*, 2017), obtaining research funding (Andrade and Kollen, 2012), understanding and communicating research impact (Karasmanis and Murphy, 2014), and helping faculty to connect with each other (Tancheva *et al.*, 2016; Monroe-Gulick *et al.*, 2017).

Understanding faculty and graduate student needs and developing new ways to support those needs over the entirety of the research lifecycle is one key element of the UW Libraries assessment project. Another is gaining a better understanding of the contribution of the Libraries to research at the UW. There are numerous bibliometric studies that explore the impact of library collections on faculty research, while the work of Hollister and Schroeder (2015) with Education faculty frames library impact in faculty's own terms, aiming to "illuminate the perceptions of faculty concerning the impact of library support on their research productivity" (p. 98) and exploring "what constitutes research productivity among faculty" (p. 98). Recent efforts such as the development of the Association of Research Libraries (ARL) Library Impact Framework are designed to support libraries in effectively articulating and measuring their impact based on the "values by which we want to measured" and the priorities that matter most to their users and institutions – including faculty research productivity and ability to obtain research funding (Baughman *et al.*, 2018).

Methods (Phase One: Survey Methodology)

While there is no shortage of literature about the changing nature of research practices, our 2016 survey data and follow-up work indicated that we needed to look more closely at what some of these trends look like in our local context. Phase One of this project involved a Spring 2019 survey distributed to faculty and graduate students in the STEM and Health Sciences fields, which include the following Colleges/Schools: Environment, Engineering, Natural Sciences, Dentistry, Medicine, Nursing, Pharmacy, Public Health, and Social Work. The survey was designed to assess user satisfaction, importance, priorities, experiences with and perceptions of Open Access publishing, and the impact of Libraries contribution to research. Surveys were distributed to all UW faculty and graduate/professional students in all Colleges and Schools in STEM and Health Sciences fields at the Seattle campus. The survey was distributed to 3669 faculty and 8516 graduate/professional students. 704 faculty surveys were returned (19% response rate) and 1570 graduate student surveys were returned (18% response rate). The faculty population also included post-doctoral research associates, and the graduate student population included master's, PhD, and professional doctoral programs.

The faculty and graduate student surveys are similar, which enables cross-group comparisons. The following questions are in common across both surveys:

- An open-ended question designed to gather examples of Libraries contributions to research: "Tell us in a few sentences about a time that Libraries staff, services, or resources had a positive impact on your work."

- Overall satisfaction with the Libraries ("How satisfied are you with the Libraries?").

- A question about the importance of various resource types to their work (journal articles, databases, books, data sets, lab protocols).

- A question about how often users are able to find the journal articles they need, with a follow up question about how users get articles that are not available through the UW system.

The survey period ran from late April to early June. An incentive of twenty University bookstore gift cards of $100 each was offered to graduate students; no incentives were offered to faculty. Comments from open-ended questions were coded using a combination of selected pre-set categories (similar to those used in 2016) and an emergent approach to identify themes.

There were some questions on the 2019 survey that had been used in previous surveys of the full faculty population, such as the 2016 Triennial Survey. We have done some limited comparisons with selected questions and categories in common using the same subset of the population from 2016 in order to understand trends over time for overall satisfaction, importance of selected resources, and Libraries contribution to faculty and student work. 2019 response rates were down compared to 2016 for these groups, especially for faculty. The percentage of faculty respondents from the Health Sciences increased from 66% in 2016 to 72%, while graduate respondents by academic area were similar to 2016 (with 53% from Health Sciences). Because of the numbers of faculty respondents, we are not analyzing data based on departments (only at the College/School level). However, more robust numbers for graduate students mean that some additional breakdown of

results at the departmental level can be done in order to provide us with more nuanced insights into differences between specific fields.

2019 Survey Results

Priorities

One of the important insights provided by the 2019 survey data relates to faculty and graduate student priorities for library services. In response to the question "Which of the following library services would be useful to your work?", the top priorities for faculty overall were:

- Strategies for monitoring literature in their field (55%)

- Assistance with conducting literature searches/systematic reviews (54%)

- Support for assessing and communicating the impact of their work (41%)

The local UW findings related to keeping up to date and support for literature searching corroborate other studies that highlight faculty challenges in keeping up with the volume of research information and literature, particularly in areas that may be interdisciplinary or outside their primary sub-field (Gordon *et al.*, 2018).

For the 41% of faculty who indicated an interest in support for assessing and communicating the impact of their research, we asked a more detailed follow-up question about the types of research impact support that might be useful. Assistance with citation metrics came up highest (81%), followed by communicating research to the public (61%) and journal impact factor (61%). In the 2016 faculty survey, assessing and communicating the impact of research also emerged as a priority (although we cannot compare 2019 and 2016 results because the categories in the service priorities question changed significantly). As a result of the 2016 survey results, we conducted small-scale assessments involving interviews with Health Sciences faculty members, as well as piloting and assessing workshops focused on research impact. Liaisons in the Health Sciences also support their individual departments in this area, the value of which was acknowledged in a handful of 2019 survey comments: "[Our librarian was] very helpful on an emerging project using citation metrics to assess our global productivity." Other work in the Libraries in recent years has focused on emerging areas such as digital storytelling as a method to communicate research to a wider public, a key institutional priority for faculty and the University, as noted above. Adding the more detailed follow-up question address in 2019 builds on this existing work and will help us to continue to explore potential areas for future exploration and service development.

Important differences emerge between faculty in STEM and Health Sciences fields in terms of priorities (as well as other areas, discussed in more detail below). For faculty in Health Sciences areas, support for literature searching and systematic reviews is a clear need, while for STEM faculty, the top priority is guidance on depositing data into a repository for long-term storage and/or sharing (51%). As one STEM faculty member noted in a comment, "I would like help on how to address journal requirement to share data and code. Advice on how to do this for very large data sets, such as climate model output is also needed."

Among STEM and Health Sciences graduate students overall, two of the priorities were similar to faculty (with two services tied for the top priority):

- Strategies for monitoring literature in their field (58%)

- Support for using citation management tools to organize and manage research sources (58%)

- Assistance with literature searches/systematic reviews (56%)

There are expected differences between students at the master's and doctoral degree levels, with assistance with literature searching and citation management coming up higher for master's students (64% and 63%, respectively), and strategies for monitoring literature in their field coming up higher for PhD students (64%).

Open Access & Scholarly Communication

Given the 2018 passage of the University of Washington Faculty Senate Open Access Policy, and the recent developments in terms of the University of California negotiations with Elsevier, one key area to explore in the survey was UW faculty activity and questions related to open access publishing and scholarly communication. Overall, 46% of faculty indicated they had published in an Open Access journal in the past academic year (51% for Health Sciences and 34% for STEM, when results are broken down by broad subject areas), which was unchanged from 2016.

Of those who published in an OA journal, the top reasons given for doing so were visibility/increased readership and journal quality (each at 43%). Journal reputation and impact factor continue to be the driving factors in faculty decisions about where to publish (and considerations about whether to publish OA). For those who did not publish in an OA journal in the past academic year, we asked an open-ended follow-up question about any questions or concerns respondents had about open access. We received 184 comments, with comments largely centered on cost and quality: there were 98 comments that specifically mentioned cost of publishing in OA journals (including article processing charges) and 91 comments about quality (including fears about "sham" journals and perceived lack of rigorous peer review). There were 11 comments that specifically mentioned Elsevier or the University of California negotiations, as well as a small number of others that expressed general concerns about the cost of journal subscriptions. As one faculty noted,

> "The business model in which we ... generate content for free, pay to have it published, and then pay to have access to it is so completely insane that I am amazed it hasn't broken yet. We need to do what we can to break the hold that Elsevier, Wiley, and a few others have on academic publishing. I favor publishing in PeerJ and Plos One, but I would further support dropping Elsevier/Wiley access – the way Berkeley has done – in order to better negotiate with them."

Libraries Contribution to & Impact on Research

Since 2007, UW Libraries surveys have asked questions of both faculty and students related to the contribution the library makes to various aspects of their work. Faculty ratings of the Libraries contribution were slightly higher than in 2016 and ended the decline in ratings seen in the 2013 and 2016 surveys. The categories where the Libraries make a major contribution are:

- Keeping current in their field (94% indicating a 4 or 5 on a 5-point scale, mean score of 4.71)

- Helping them make more efficient use of their time (90%, mean score 4.56)

- Being more productive researchers (87%, mean score 4.51)

For graduate students, there were significant increases in contribution scores between 2016 and 2019. The categories where the Libraries make a major contribution for graduate students are:

- Achieving overall academic success (83%, mean score of 4.33)

- Keeping current in their field (81%, mean score 4.29)

- Being more productive researchers (77%, mean score 4.26)

In addition to a Likert-scale question that asks faculty and graduate students to rate the library contribution to selected research activities, we also ask an open-ended question: "Tell us about a time that Libraries staff, services, or resources had a positive impact on your work." First introduced in our 2016 survey, this question helps us capture stories in users' own words about the difference that the Libraries makes to their work: "I use the library daily, and it always makes a major impact in all of my work, from grant submissions that include the latest research findings to community requests for literature reviews on topics that are not well represented in the grey literature" (Faculty comment).

Taken together, this qualitative and quantitative data enables the Libraries to tell the story of our contribution to the University's research mission. It also highlights areas where additional work may be needed. In the case of the 2019 survey results, one particular aspect for further investigation is our impact on helping faculty get research funding/grants (rated lowest on the faculty survey in both 2016 and 2019), and how we might be better able to support this aspect of faculty work.

Differences between STEM & Health Sciences

One of the takeaways from the survey results is the differences that exist between STEM and Health Science faculty respondents in key areas, and the patterns that have begun to emerge for STEM faculty. STEM faculty were more likely to make their work available through a repository or website and make data sets available through repositories/websites. They also ranked assistance with depositing data in a repository as the service that would be most useful to their work. STEM faculty tended to deposit scholarly output in disciplinary repositories (such as bioRxiv or ArXiv), while those in the Health Sciences primarily used government repositories. Health Sciences faculty overall satisfaction ratings were higher, as were their ratings for Libraries' contributions to their work, most notably in their contribution to getting grants/funding. Health Sciences faculty were more likely to publish in OA journals, and the most useful services were assistance with literature searches and strategies for keeping up to date.

Overall, both this specific pattern of differences between STEM and Health Sciences, and the 2019 survey data generally, opens up a number of opportunities for new service development and further assessments. Data analysis will continue in Summer 2019, including more detailed analysis of potential differences between faculty at different ranks/stages in their careers, possible correlations between various responses (such as interest in particular services, rating of contribution, and activities in research and publishing), and as well as breakdowns by department for graduate student results.

Next steps: Phase Two (Fall 2019 – Summer 2020)

The Spring 2019 survey was designed as phase one of a multi-part mixed-methods approach to understanding STEM and Health Sciences faculty and graduate student needs. While the survey provides useful baseline data, we also need to understand in greater depth the nuances and reasons behind some of the patterns we've identified through the survey. In order to explore our questions further and flesh out the survey data, we will be conducting in-depth interviews focused on workflows over the course of the entire research lifecycle. Rather than concentrate on Libraries specifically, these interviews are designed to provide insights into how faculty generate research questions, develop funding proposals, keep up to date with literature, store research data and personal research materials, communicate research findings, and identify the impact of their work for their promotion and tenure processes. Interviews will provide us with better insights about how these practices might vary across subject areas, as well as stage of academic career.

One key strand of this work will focus specifically on interviews with faculty and students working in interdisciplinary and multidisciplinary programs and research centers. The number of these centers continues to grow rapidly at our institution, and we are curious to learn more about whether and how research needs might be different than in traditional disciplinary areas (MacKenzie, 2014; Monroe-Gulick et al., 2017). For many STEM fields, research is less focused on the "independent scholar model" and instead occurs in team-based centers, groups, and labs that comprise faculty, staff, postdoctoral researchers, and students (Long and Schonfeld, 2013; MacKenzie, 2014). Gaining a better understanding of how collaborative research happens in interdisciplinary labs and centers will enable the UW Libraries to more effectively meet researchers where they are and provide relevant services. In order to lay the foundation for this, we also piloted a survey for research scientists in Health Sciences fields. The data from this survey, alongside that from faculty and students, will help us better understand the overall research group ecosystem, which we can build on for Phase Two of this project.

Follow up work will also concentrate on specific topics that warrant further investigation. One targeted project planned for 2019-20 will examine how the Libraries currently contributes to faculty obtaining research grant funding and what additional services might be developed to strengthen that contribution. In order to explore this question, the UW Libraries will be participating in the Association of Research Libraries Impact Pilot Project focused on how libraries contribute to faculty

productivity (in partnership with the University of California Davis and the University of Pittsburgh). While some faculty noted in 2019 survey comments that the Libraries made a contribution to their ability to get research funding, questions remain about the nature of this support and how we might increase the Libraries impact in this area.

Conclusion

The 2019 University of Washington Libraries survey of faculty and graduate students in STEM and Health Sciences fields represents the first step of an extended mixed-methods project designed to understand the needs and workflows of researchers in these fields, and to explore the impact of the Libraries on their work. The survey has provided significant insights into faculty and graduate student service priorities, publishing activity and perceptions of Open Access, and the contribution the Libraries makes to their research. The results, which will continue to be analyzed through Summer 2019, will be used to further develop services and to shape follow-up assessments. Phase Two of the project will begin in Fall 2019 and will focus on in-depth interviews with faculty and graduate students in these disciplinary areas and a targeted follow-up project examining the Libraries' contribution to faculty's ability to obtain research funding. It is anticipated that results from Phase Two will be available in Summer 2020.

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Understanding User Experience in Bring Your Own Device spaces in the library

A case study of space planning and use at a large research university

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Abstract

Purpose - This multi-dimensional study, triangulates qualitative and quantitative data with existing data to inform on the function and user experience of a newly created the "News Library." Further, to inform on the viability of "bring your own device spaces" (BYOD) in meeting the computing needs of Penn State University Park students.

Methodology - This study leverages several methodologies for data collection, including observation, survey, flip chart prompts, interviews, and focus groups.

Findings - Findings suggest that the News Library accommodates the social needs of users. However, it does not accommodate their communal needs well. The majority of students at the Penn State University Park campus, own laptops, and bring them to the library when they intend to study. That personal device usage is preferable to library-provided computers per a familiarity with their personal device, access to personal files, and independence of workspace.

Practical limitations – As this is a case study, the findings are not generalizable. This study was conducted in one library setting, on one campus of a twenty-four campus institution with a total of over 30 libraries.

Conclusions – Results demonstrate that the News Library expands the footprint of space available to students and accommodates social needs. The flexibility and mobility of using personal laptops in the library were highly valued per the associated sense of intimacy and connectedness with their devices, suggests that BYOD is a viable approach for library space planning.

Originality and value - The mixed-methods study provides multiple views into user behaviors and expectations. Authors propose guidelines for informing the design of BYOD spaces.

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User-Centric Evaluation of Non-Print Legal Deposit in the United Kingdom: The Digital Library Futures Approach

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Introduction

Legal deposit, which ensures the systematic preservation of published materials for future generations, is the legal requirement that a person or group submit copies of official publications to a trusted repository or repositories. Statutory provision for legal deposit dates back to the 16th Century (Lariviere, 2000, p. 6), and the concept of legal deposit has existed in English law since 1662, and British law since 1710. The Copyright Act 1911, updated by the Legal Deposit Libraries Act 2003, makes provision for the following six legal deposit libraries to receive copies of publications released in the United Kingdom: the British Library; the National Library of Wales; the National Library of Scotland; the Bodleian Libraries, University of Oxford; the Cambridge University Library; and the Library of Trinity College Dublin. Six years ago, UK legal deposit was extended by "The Legal Deposit Libraries (Non-Print Works) Regulations 2013" (2013) to include online and offline electronic publications in writing, including eBooks, eJournals, electronic mapping, and the UK web domain.

This paper will focus upon usage of Non-Print Legal Deposit (NPLD) collections in UK academic legal deposit libraries. Despite the expansion of UK legal deposit, there is almost no research into the impact and value of NPLD collections for users. Existing studies focus on "four pillars of NPLD strategy: collection development, including selection and metadata; long-term digital preservation of NPLD materials; technical aspects including systems capture, ingest and standards; and regulatory aspects" (Gooding, Terras and Berube, 2019). We therefore aim to address the lack of user-focused evaluation of NPLD services by presenting the work of the AHRC-funded *Digital Library Futures* project. The research set out to answer the following primary research question: what is the impact of the 2013 NPLD regulations upon UK academic deposit libraries and their users? This paper will outline the results of this work, focusing on the challenges that users of NPLD face in order to demonstrate the important role of user-centric evaluation in the development of digital resources. It acts as the first user-centric analysis of the impact and value of NPLD in the UK, and fills an important gap in the methodological literature by demonstrating best practice in studying digital collections for which there is no pre-defined user community.

Background

Two key points informed our methodological approach. The first was how to account for access arrangements to NPLD. The 2003 Legal Deposit Act, subsequently informed by the 2013 regulations, define how NPLD collections can be accessed and used. The most important points for users are that reader access to NPLD materials is limited only to fixed computer terminals located on the physical premises o the legal deposit libraries, that materials must only be accessible to one user at a time at each legal deposit library, and that forms of reuse such as text and data mining are not allowed. These restrictions are intended to "mirror the level of access to printed publications" (HL Deb, 2013). In practice, there are several areas where this is not the case: for instance, Andrew Green noted that the lack of time limits on the access restrictions created a form of "perpetual copyright" which limits reuse even as materials enter the public domain (2012). Furthermore, the legal deposit regulations specify that any additional use cases are allowable only through primary legislation, which means that there are discrepancies between NPLD protocols and the latest shifts in disabled provision and copyright law. The government's guidance specifies that access to NPLD materials for visually impaired persons is based upon the Copyright, Designs and Patents Act 1988 as amended by the Copyright (Visually Impaired Persons) Act 2002. In practice, this means that NPLD protocols for disabled peoples now lag behind the 2014 amendments that extended disability regulations to make accessible formats available to all with a recognised disability. Similarly, the 2014 copyright exception to allow non-commercial text and data mining is not reflected in the regulations.

The second key point was how to define impact and value in relation to NPLD. Researchers have engaged in the definition, modelling, and development of methods for studying the impact and value of digital library collections. However, the resultant work often defines impact poorly or not at all (Gooding, Terras and Berube, 2019, p. 15). Similarly, there is a gap in our understanding of evaluation for resources without a defined contemporary user community. The UK government's approach to NPLD focuses upon posterity rather than contemporary usage, while exiting models for impact evaluation such as Tanner's Balanced Value Impact Model refer to measuring impact upon an "intended" community (2012, p. 12). The intended community for NPLD is often defined as future researchers, and so there is a need to consider how evaluation of NPLD can contribute to the development of methodological interventions into collections with poorly or undefined user communities.

Impact evaluation in cultural heritage organisations generally distinguishes between intrinsic value (the value something has in and of itself), and instrumental value (the value something has because it helps to achieve or get something. While the former emphasises notions of cultural significance and prestige that are often the focus of debates around legal deposit, instrumentalism ascribes a clear social function to arts and culture. In this paper, we align the instrumental argument closely with the service-driven ethos of contemporary librarianship (e.g. Shera, 1973; Lankes, 2011), by considering how NPLD might allow the library sector to serve existing and future user needs. In light of this approach, we define value and impact for NPLD as follows:

1.) **Value** refers to the benefits, or lack thereof, of NPLD collections for libraries and their users.

2.) **Impact** refers to the way in which NPLD collections effect change in collection and managing NPLD collections, and in information seeking behaviour (Gooding, Terras and Berube, 2019, p. 16).

Methodology

We adopted a mixed methods case study approach to analyse the impact of NPLD upon two key stakeholder groups: 1.) academic deposit libraries in the UK and 2.) users of academic deposit libraries in the UK. Data collection occurred between 2017 and 2018, and was undertaken with the support of our project partners: The Bodleian Libraries, University of Oxford; and the Cambridge University Library. We used a range of qualitative and quantitative methods to address our research questions:

1.) **Interviews**: we undertook interviews with 36 expert stakeholders, including key figures at academic deposit libraries, academics in related fields, publishing industry representatives, and policymakers. We used semi-structured interviews, with core sets of questions designed for each stakeholder type and library role holder, and further adapted based on research into an individual's skills and experiences. These questions were further mapped to specific research questions, and formed the basis of flexible interviews of roughly one hour per person. The interviews were subsequently qualitatively coded to allow us to evaluate staff and institutional impact. Our approach to coding reflected the three level approach suggested by Hahn (2008): "initial coding", to develop categories and themes; "focused coding" to start grouping categories under one larger category; and "axial coding" to refine ideas with a finer focus.

2.) **Surveys:** we surveyed 40 users of the Bodleian Libraries, and 40 users of the Cambridge University Library, recruited through a heterogeneous purposive sample to ensure representation from a broad range of disciplines. The survey was deliberately delivered to a small group of users, as the objective was to gather in-depth feedback that would allow us to link respondents' broader information seeking behaviour to their experiences of NPLD collections. This was partly a response to previous problems identifying and recruiting users of NPLD collections, as users were generally unaware of the difference between NPLD and other digital collections. The survey was designed around a series of tasks that required users to come into contact with NPLD materials, and to report not only their experience of doing so but other aspects of their scholarly information seeking behaviour. This allowed us to analyse how NPLD interacts with broader models for scholarly information seeking and discovery.

3.) **Web analytics:** We also undertook two forms of web analytics. First, we undertook web log analysis of usage of NPLD terminals in the academic deposit libraries, which provided headline statistics of usage of materials via NPLD terminals. Second, we undertook a subject-based analysis of datasets of title-level access requests for NPLD materials. This approach was based upon Marcia Bates' observation that scholarly communication practices function differently across domains, and that "these differences do make a difference" (Bates, 1998, p. 1,200). In other words, it should be possible to identify differences in behaviour by studying which subjects are requested by users. We analysed two datasets, spanning the period from 31st July 2015 to 31st March 2017: metadata for all eBook title requests (91,809 requests at title level); and metadata for all eJournal article requests (36,505 requests at article level). We developed a small Python-based tool, which used the OCLC Classify2 API service to obtain Dewey Decimal (DDC) and Library of Congress (LCC) classmarks for each record. We then discarded unclassified records and analysed the remaining records to identify subject-based patterns of usage of NLD materials.

Findings

We discovered almost unanimous agreement that NPLD had immense intrinsic value. Interviewees emphasised the prestige and posterity value of NPLD collections and associated legal deposit with the core mission of their libraries. One interviewee described NPLD as a "gold standard", and the capture of online mapping and web archival materials were viewed by several respondents as major steps forward. This agreement between our interviews led us to conclude that NPLD has broad intrinsic value due to its perceived prestige, potential to benefit future researchers, and its role in preserving the UK's published output. It can therefore be considered highly successful at meeting the UK government's objective of preserving non-print materials for future generations (Department for Digital, Culture, Media & Sport, 2019).

However, it was much more difficult to identify the instrumental value of Non-Print Legal Deposit. Library staff were particularly disappointed with the access arrangements, citing the need for researchers to come into the library as damaging to efforts elsewhere to widen participation and usage. Interviewees repeatedly noted two points as particularly damaging: first, that users were forced to access materials in the library reading rooms rather than remotely; and second, that the restricted opportunities for innovative reuse of NPLD materials were a source of frustration for users. Others felt that it was hard to convince readers of the benefits of NPLD when it went against their efforts to "make it easier for people to get access" to purchased collections, while others expressed dissatisfaction with the quality of NPLD copies in comparison to purchased print and digital collections (Gooding, Terras and Berube, 2019, p. 17).

Our interviewees also felt that user requirements for NPLD collections had not been fully considered in the development and implementation of the regulations until a late stage. This was seen to be damaging because of the way that it undermined other efforts to support users. Similarly, it made it difficult to assess the impact of NPLD upon users because we found that there had been no defined success criteria for users. Very little user assessment had been conducted to contextualise access statistics, leaving a gap in how we understand the impact and value of NPLD.

In response, our methods for analysing usage foreground innovative approaches that are designed to foreground the links between primary data collection and the secondary literature. As users were conceptually unfamiliar with NPLD, we focused upon survey how NPLD fitted into their broader information seeking behaviour rather than engaging users directly in questions about the collections. We established the baseline characteristics of information-seeking behaviour for our sample, and then gave them information seeking tasks that force them to come into contact with NPLD materials for successful completion. While our respondents came from a variety of disciplinary backgrounds, several common features arose:

1.) The respondents worked remotely on a personal device, using commercial search engines or library databases to start their search, and using some form of remote authentication to access subscription materials.

2.) They were often engaged in work away from the university, including international fieldwork, that necessitated remote access to library resources.

3.) Depending on their discipline, they were likely to report working with a set group of electronic resources.

4.) They used web archival materials, including the UK Legal Deposit Web Archive, very little or not at all.

5.)   They sometimes visited central library sites in person, but were more likely to use faculty, department, or subject libraries due to community and relevance.

This profile maps closely to existing studies which show that users increasingly want remote access to resources, at scale, in the formats that they desire, and across a variety of digital resources. In this sense, NPLD access protocols provide a poor match for information seeking behaviours with digital materials. For instance, the NPLD protocols are problematic when mapped against the "scholarly primitives" posed by John Unsworth: "discovering; annotating; comparing; referring; sampling; illustrating; and representing" (2000). NPLD collections actively impede several of these established scholarly workflows.

As a result, when respondents were asked "Would you consider using NPLD materials regularly, 64% of respondents said no. When asked to elaborate, respondents mentioned similar issues to our library staff: remote inaccessibility and the lack of a clear use case for NPLD materials over other resources were cited as two reasons for their decision. That said, for those willing to travel to libraries, NPLD protocols provide support for certain aspects of scholarly research: respondents noted that they preferred to print, save or read discovered resources right away. NPLD allows reading and printing, and it is therefore likely that researchers who overcome their unwillingness to use fixed terminals are reasonably well served in this regard. However, the need for annotation, bibliographic management, and downloading of materials for later reuse and comparison is less well supported, and put our respondents off using NPLD materials. While these findings are informative in themselves, we would argue that it was key to the success of our study to be able to situate responses in relation to existing literature as a way of addressing the lack of defined community from which to derive objectives for evaluation.

Similarly, we found no evidence that NPLD materials were changing the type of resources that were being used. For instance, our subject-level analysis showed that usage of NPLD collections followed long-established disciplinary boundaries. Access requests for NPLD titles in the Arts and Humanities were more common for eBooks than eJournals, while eJournal requests heavily favoured Technology subjects. These observations reflect existing studies that argue that researchers in the Arts and Humanities still see books as a vital source (Stone, 1982, p. 296; Palmer and Cragin, 2008, p. 171), whereas technology and science subjects tend to rely on faster access to new research and thus favour journals (Talja and Maula, 2003).

This process of combining innovative methods for data analysis with deep reference to existing studies allows us to move towards an understanding of how NPLD challenges established user behaviours with digital resources. By comparing user behaviour more broadly to the opportunities for usage of NPLD, we can therefore conclude that the impact of NPLD upon researchers has been limited, due to a combination of access arrangements and limited awareness of NPLD resources. Furthermore, NPLD access is built upon a case that, to a large extent, impedes online information seeking behaviours and scholarly work. We understand such a methodological approach to be user-centric in nature, because it necessitates both close attention to the user context for a particular digital resource, and to the broader scholarly literature surrounding digital resources in general. In doing so, we found that the difficulties associated with evaluating resources in the absence of a defined community were alleviated. That said, it also made clear that a neglect of similar work in NPLD implementation meant that there is no compelling argument that the instrumental value of NPLD has been as fully realised as its intrinsic value.

Conclusion

Non-Print Legal Deposit has been extremely successful in preserving the United Kingdom's digital textual publications, but it also provides a case study into the implications of neglecting users in the planning and implementation phases of resource development. The case of NPLD indicates how neglect of the user context during strategic planning can lead to digital resources that pose significant challenges for library user communities. We therefore propose that it is necessary to adopt a culture of "User-Centric Evaluation" of NPLD. We propose that user-centric evaluation should be built upon a framework of five key tenets:

1.) Users are the long-term beneficiaries of NPLD, not publishers or libraries.

2.) The change in information sharing, libraries and research communities that results from the digital turn necessitates re-evaluation of print as a default reference point for NPLD.

3.) Publishers are entitled to protect their commercial and legitimate interests, but the growing significance of Open Access and changing Intellectual Property rights cannot be ignored.

4.) Libraries must be empowered to take actions in response to emerging information behaviours. These actions should be based on evidenced trends, and focused upon making collections accessible, usable, and meaningful to users in the long term.

5.) The first four tenets require continued collaboration between libraries, publishers, and user groups.

These five tenets are expanded upon in our recent white paper (Gooding, Terras and Berube, 2019). However, certain competencies are required to successfully develop such a culture of user-centric evaluation of NPLD. When devising our methodology, we found existing models for impact evaluation to be incomplete because they refer to existing user communities. For NPLD this was reflected in the split between the confident expression of its intrinsic value and the hesitancy over its instrumental value. The problematic status of NPLD for contemporary users was found to stem from the fact that NPLD collections were not seen as a service to contemporary users. The value of NPLD was framed largely in terms of its long-term benefits, but there was no clear plan for ensuring that these benefits were realised in the long term.

In methodological terms, there is a need to address this gap between existing models for impact evaluation, which emphasise impact upon intended communities, and collections for which there is no clearly identifiable community in the short to medium term. Certain activities, such as resource development, interface design, and digital preservation (Digital Preservation Coalition, 2017), require proactive evaluation to ensure they remain relevant and meaningful in the future. We therefore argue that user-centric analysis is key to address this problem, because it aligns evaluation activities with the service-driven ethos of contemporary librarianship. In other words, user-centric analysis where communities are poorly defined requires librarians to consider not only issues relating to technical implementation and UX, but to develop methods that meaningfully relate broader information seeking trends to the resource in question. This can often require a "flexible and potentially experimental approach to research methodology" (Gooding, Terras and Berube, 2019, p. 27) to uncover relationships in innovative ways. It also requires broad engagement between library practitioners and researchers in order to ensure the relevance of theoretical and critical work to practical implementation of library digital resources.

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Wayfinding in the library

A usability study with focus on accessibility

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Background

The library organisation of Lund University consists of a network with several faculty libraries and the University Library. The latter has three areas of responsibilities: it is a legal deposit library with large cultural heritage collections; it is responsible for the digital library, including systems and collections; it is a learning resource centre with around 500 study places.

The University Library is quite an impressive building constructed in the beginning of the 20th century. As the collections and the use of the library have grown several additions have been made to the original building, resulting in a public space which is difficult to read and to navigate within. The public areas are situated on the bottom floor (information desk, reference collections and different study areas, from silent reading rooms to group study places and group rooms), first floor (more reference collections and study places), second floor (a reading room reserved for researchers) and third floor (mainly the open collections). Furthermore, a special collections reading room and microfilm readers are placed in the basement.

In 2016 In 2016 we conducted several UX (User Experience) investigations in the library, and one of the findings were the difficulty to find the way in the library room. As a consequence, a wayfinding project was launched in 2018, and it's still ongoing.

Wayfinding

Wayfinding is the act to find one's way to a specific place, and in this context to be able to navigate within the public spaces of the library. Probably due to the many additions to the original building, the library space seems difficult to read for the visitor, it does not match the visitor's mental picture of the room.

For instance, the most heavily used collection is the open collection, located on the third floor. In order to get there, the user must either take an elevator situated quite close to the information desk, either find the way to the staircase located in the opposite end of the building. A large majority of new users looking for the open collections must ask the information desk in order to find them.

Wayfinding is not only a question of signs. In a perfect world the space would be so organised that everybody should be able to find their way without any signs. Rebuilding and reorganising the public space would probably improve wayfinding considerable, but funding has not yet been approved even though the need is recognised by library and university management.

Usability and usability studies

"Usability is a perspective, a philosophy, a conviction that systems and buildings and signs can be created that are self-evident, widely intelligible, and do not require motivation." (D.M. Lanclos 2016)

Usability testing is about observing users performing common tasks in your system or library space, to detect obstacles to usability.

It seems that most commonly, the terms usability and usability testing are used in relation to web places and digital systems. In our organisation we have adopted Steve Krug's (2010) method to test the usability of our library system, discovery

system, web pages and so forth. It's a quite straightforward approach: we select the functionality to test in a specific service/system, write a scenario and some tasks, and engage respondents to perform these tasks while observed by the developers/administrators/librarians responsible for the system. After the tests the observers identify the three most important usability problems, and try to find solutions to these problems. Once the solutions have been implemented, they can be tested again.

A usability test of the wayfinding in the library

Even though we knew very well that there were wayfinding difficulties in the library space and we had hypothesis about the causes of these difficulties, we did not have any actual evidence. Therefore, the wayfinding project felt a need to make an investigation to get a deeper understanding of the problems. Also, the project had a heavy focus on accessibility and inclusiveness, and wanted these aspects to be included.

In spring 2018 my colleague Maria Långh and me were asked to conduct a study to understand how to improve wayfinding. We decided to do a usability test in the physical library space, and to engage respondents with different disabilities, both visible and invisible.

We constructed a scenario and three tasks: You're taking a history course, and your study group shall write a paper. You have promised to copy a chapter in a methodology book and afterwards join the others in a group room.

- Find the book Textens hantverk by Inger Lindstedt, on the shelf "Methodology"
- Copy chapter 3
- Join your group in the room called "Investigatoriet"

We engaged five respondents, four undergraduate students and one PhD student. Two of the respondents had a visual impairment, one had dyslexia and one had ADHD and one were very engaged in LBGT issues.

We had an individual session with each respondent, lasting more or less one hour. Maria and me took turns to be test leader, and to observe, including record the sessions and taking photos. All sessions were transcribed and analysed.

In each session we met the respondent in the entrance hall and explained the scenario and the first task. Then we let the respondent take the lead, and to think aloud during the entire test. Actually, it became a dialogue between the respondent and the test leader took care not to point out any directions or giving instructions that could deter the test results.

In addition, two colleagues did observations to identify bump points, points/places in the space where the user does not know where to go/to proceed. These bump points corresponded with the findings of the usability tests.

We also invited two experts in Universal design, two researchers from the institute Certec at the Faculty of Technology at Lund University (Eftring & Svensk, 2017). They made an evaluation of the public space from an accessibility perspective. This evaluation was very useful as a reference when analysing and understanding the findings.

Findings

According to amongst other Eftring and Svensk (2017) and Lanclos (2016) a space should be designed to be intuitive and easy to navigate, in the best worlds we should not need any signs. At least at the University Library in Lund we are not there yet, so we need to identify the bump points, the points where the visitor's mental picture of the room and the design of the room do not coincide.

The usability tests clearly indicate several bump points. One is the area around the information desk. The desk is situated very close to the entrance, but from the desk there are very few indications on how to proceed to reach different areas in the library. In our study the respondents should find their way to the open collection on the third floor. As one respondent said, "I have actually no idea where to begin". In order to reach the staircases leading up to the open collection they needed to turn around a corner a walk straight to the other side of the building. All of actually turned around the corner, probably because it

was quite busy in that area, but they were all unsecure about walking in the right direction before finally reaching a sign referring to the open collection.

Another important principle is to identify a desire path to each destination and to make it easy for visitors to follow these paths (Eftring & Svensk 2017; Andrews 2016). If many different paths to one destination are indicated, it will be confusing for the user. In the usability study the respondents had large difficulties to find the group room "Investigatoriet" just because signs pointing towards group rooms are placed in many different locations on the bottom and first floor. This was obviously very confusing, all respondents needed some help to be successful.

A third principle is to clearly indicate when the user has reached the desired destination, and that this information should match the directional signs (Eftring & Svensk 2017). It is important to use the same terminology on the signs and at the destination. Once again, this became obvious in the usability study, where signs with the text "Group room" pointed to an open group study area.

The graphical design of the signs
The usability test confirmed our suspicion that many of the signs were inaccessible, due to their graphical design. Many of the signs are made of brass, with black text. These were strictly impossible to read for the respondents with visual impairments, as well as for the respondent with dyslexia. An additional problem with these signs, are the lack of flexibility, if you want to change the text you need a new sign.
Other signs are dark blue, with golden text. These signs are placed very near the ceiling, and in several cases just behind a fluorescent lamp and the reflecting light made these signs difficult to read for the respondents with visual impairment.
Temporary signs are designed according to the University's current graphical profile, with bronze coloured text on pastel green, blue or pink background. These signs were difficult to read for the respondents with visual impairment and with dyslexia.
The respondent with ADHD did not have any problems reading the different signs, but was much confused by the variety of (and sometimes contradictory) signs in different styles.
The respondent with focus on LBGT issues was much concerned by the toilet signs. These show a traditional pictogram of a woman and a man, separated by a vertical line which is supposed to indicate the toilets are unisex but actually give the impression that toilets to the left are for women and toilets to the right for men. Besides this confusion and a pictogram which is conventional when it comes to gender norms, the sign leaves persons not identifying themselves as either men or women at loss.

Prototyping
Once we had analysed the results of the usability study, the analysis was given to a design student at the Faculty of Technology, Paul de Medeiros, who was commissioned to make prototypes of the wayfinding from the main entrance to the microfilm reading rooms in the basement. Based on the seven principles of Universal design (1 and the section below), Paul designed signs with yellow text on black background, in a sans-serif font. Since the path to the microfilm rooms partly

1 The seven principles of Human design:
1. Equitable use
2. Flexible use
3. Simple and intuitive use
4. Perceptible information
5. Tolerance for error
6. Low physical effort
7. Size and space for approach and use

coincides with the path to the open collection, he could make use of the identified bump points when deciding on the location for the signs. Paul placed the signs on a level estimated to make them readable for everybody, not to low neither to high,

We tested the prototypes with a new usability test, with two tasks: find the way from the main entrance to the microfilm reading room; find the way back again. This usability test was carried out in May, with a few of the respondents from the first usability test and some new respondents.

All respondents were able to complete the task to find their way to the microfilm room, all but one did find their way back to the main entrance without problems.

We also invited all visitors to the library to give us their opinion of the prototypes, placing a table with paper sheets and pencils close to the exit of the library. The library staff was invited to give feedback on the intranet.

Universal Design

The definition of Universal Design (UD) is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design (Centre for Universal Design, 1997). Instead of creating "special cases" (Andrews 2016) or adaptions to make buildings/environments/services accessibility to users with special needs, Universal Design aims to be accessible and usable for all users, regardless of disability, gender, age or other factors. To quote Hedwall (2015, p. 44, my translation) "…Universal Design ... is especially exciting since it's about all human beings, not only disabled persons. It stands for a philosophy of diversity, there the design and the design processes concern just as much left handed and right handed people, or introverts and extroverts as how well sighted or mobile a person is."

Discussion

It was very useful to perform a usability study in the physical library. The respondents got defined tasks to perform, and their approach to solve the tasks, and how successful they were, could be analysed.

The usability study was designed to give evidence about the accessibility of the wayfinding in the University Library. It did give evidence about the lack of accessibility in the design of the signs, something we beforehand suspected would be the case. We also got useful insights in how to not place signs, in order for them to be readable for persons with visual impairment.

However, many of our findings are most probably just as applicable for persons without disabilities as for persons with disabilities. The respondent who, to our knowledge, did not have any disabilities had the same problems completing the tasks and finding the way in the library space as the other respondents.

By consequently employing Universal Design when planning and designing the wayfinding in the library space, we could make it usable, intuitive and inclusive for all our users, regardless of disability, gender, age or other factors. An accessibility and inclusive environment is good for everybody.

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What is a good archive?

A tentative draft of quality criteria and key indicators for archives

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Abstract

The paper defines criteria for "good" performance of archives and tries to identify methods for assessing such "goodness", based on preliminary archival studies and on the established quality indicators for libraries and museums.

What is an archive?

We seem to be tolerably clear about what constitutes a library, and probably we could describe a museum. But what exactly is an archive? If you ask what people think that archives collect, they will name handwritten or typed materials, dossiers of administrative institutions, in any case "old" papers. But what should an archive collect, what are the duties and where the boundaries, e. g. to libraries?

ISO has a standard for the vocabulary of the whole information field: ISO 5127. There we find two definitions for "archives", namely the collection and the institution:

- archives (1)
  organization or part of an organization responsible for selection, acquisition, preservation and availability of one or more archives <records>

- archives (2)
  materials created or received by a person, family or organization, public or private, in the conduct of their affairs and preserved because of the enduring value contained in them or as evidence of the functions and responsibilities of their creator, especially those materials maintained using the principles of provenance, of original order and of collective control.

SAA, the Society for American Archivists, uses the same differentiation between archives as insktitutions and as specific collections:

- The word *archives* (usually written with a lower case *a* and sometimes referred to in the singular, as *archive*) refers to the permanently valuable records—such as letters, reports, accounts, minute books, draft and final manuscripts, and photographs—of people, businesses, and government. These records are kept because they have continuing value to the creating agency and to other potential users.

- An *Archives* (often written with a capital *A* and usually, but not always, in the plural) is an organization dedicated to preserving the documentary heritage of a particular group [or person]: a city, a province or state, a business, a university, or a community.

This paper deals with the archive as institution that can house different "archives" in the sense of collections.

The ISO standards for archives, libraries and museums

Archives, libraries and museums are generally seen as three types of institutions with a common task: to collect, preserve and promote the national cultural heritage. They differ in content, material and uniqueness of their collected objects, in their ways of acquisition and in the obligation to comprehensive preservation. Simply put:

Libraries collect information resources, generally textual, on different media, often available elsewhere, more for present than for future use.

Museums collect objects of cultural, historical or scientific importance, often two-dimensional or three-dimensional, for the most part unique, of any kind of material, and that should generally be preserved.

Archives house documents (records) accumulated by an organization or person in the course of their life, for the most part textual, usually unique, and that must be preserved.

Those tasks can overlap: Museums can own print or handwritten materials, libraries can collect pictures or toys, archives in their special collections can house books or objects of art. Digitization projects have proved how closely related these collections are, e. g. letters, photos, maps, books, audio documents and weapons in a digital World War I exhibition.

ISO (International Organization for Standardization) has combined issues of assessment for the three institutions in one Committee: ISO Technical Committee 46 "Information and documentation", Subcommittee 8 "Quality – Statistics and performance evaluation". SC 8 is responsible for "standardization of quantitative and qualitative data for the management of information organizations and content providers, e.g., libraries, archives, museums and publishers." Until recent years, the Committee concentrated for the most part on libraries. In 2012 SC 8 decided to take up museum evaluation, and currently a standard for archive statistics is under progress. Standardization for each type of institution has started with statistics and gone on to performance and impact assessment. There are now the following standards and projects:

Libraries
- ISO 2789: 2013 International library **statistics**
- ISO 11620: 2014 Library **performance indicators**
- ISO 16439: 2014 Methods and procedures for assessing the **impact** of libraries
- ISO 21248: 2019 **Quality assessment** for national libraries

Museums
- ISO 18461: 2016 International museum **statistics**
- ISO/DIS 21246: 2019 **Key indicators** for museums (might be published in the beginning of 2020)

 Archives
- ISO NP 24083 International archive **statistics** (ongoing project)

There is as yet no project for quality indicators for archives, but the coming standard on archive statistics will hopefully solve many problems of definitions that have impeded an agreement on joint quality measures.

Main tasks of archives

An archive usually has a specific mandate, namely the responsibility for collecting and preserving primary source documents of one or more particular institutions, organizations, societies, or persons. The mandate can be based on government legislation. The documents, created in the course of an institution's or person's life, can be printed or handwritten, audio and audio-visual, digital and analogue. They can originate e. g. from governmental institutions, businesses, religious organizations, cultural and social institutions, families and individuals. For libraries the archives of universities, schools and communities might be the most interesting. Even an individual library can of course have an archive, documenting the development of buildings, collections and services, but that archive would be part of the library.

The recent literature about archives, the websites of associations of archives and archivists and the ISO project for archives statistics (ISO/NP 24083) largely agree on the main tasks of archives:

1. *Appraisal*: This task is crucial for archives. In accordance with their mandate, archives determine the historical value of documents (records) in their context or jurisdiction. Records that they think worthy of preservation are transferred to the archive for permanent retention. These decisions are for the most part irrevocable, as rejected documents are destroyed. Correct and far-seeing appraisal decides on the archive's ability to answer future questions.
2. *Acquisition:* When the selected materials have been either transferred physically to the archive or installed on servers, an accessioning process must follow, similar to that in libraries.
3. *Arrangement*: Archival material is principally arranged by provenance. Records from the same creator are kept together in groups or series which can be further structured according to function, activity, or document type. Finding aids, or inventories, show the structure and composition of each group.
4. *Description*: The records must be analyzed and described so that they can be identified and found. The description includes creator, title, dates, contents, and the context of the record. In addition it should show details about the physical format and condition and access and reproduction rights.
5. *Preservation/conservation:* As the records are meant to be kept permanently, they should be stored safely and handled carefully. In order to secure their informational content and conserve the originals, materials have often been reproduced in microforms or other media. Recently, digital surrogates combine preservation with better access to the records.
6. *Access for users*: Archives are generally committed to give access to their holdings to interested persons, unless there are legal or other types of restrictions. As archival material is usually unique, access to physical items is normally granted only in the reading room or via surrogates.
7. *Public outreach:* Many archivists are engaged in research about archival material, and archives produce publications about topics represented in their holdings. Archives also organize exhibitions and events related to their holdings. The educational services include guided tours and activities for students and school classes.

A comparison of libraries and archives

The tasks as described above are for a great part similar to those of libraries, especially libraries with a mandate for collecting and preserving specified information (e. g. legal deposit). But there are substantial differences in acquisition, arrangement and description of the collections. The most striking difference consists in the "appraisal", the deliberate and well-founded decision for permanent acceptance or rejection of documents.

The following table shows an overview of the similarities and differences. Every task described in the following applies both to analogue and digital documents kept in archives.

	Libraries	Archives
Collections		
materials	Primarily published items (e.g., books, journals, eBooks, etc.)	Primarily unpublished items (e.g., letters, manuscripts, etc.)
	Discrete items with independent significance	Groups of discrete items; significance from relationship to other items
	Documents are for the greater part mass products and therefore often available elsewhere.	Documents are usually unique and not available elsewhere.
creation	Individuals or organizations by separate action (writing, publishing)	Organizations, institutions, persons in the normal course of business or life
acquisition	Materials are usually purchased, but libraries also receive significant gifts.	Materials are usually transferred, not purchased.
	Materials are usually selected as single items.	Materials are usually selected (appraised) in aggregates.
	Decisions are revocable.	Decisions are for the most part irrevocable (rejected items are destroyed).
	Collection building is primarily use-oriented, following the current interests of the population to be served.	Material is usually selected in accordance with archives' mandates, independent of current use.
arrangement	Materials are either arranged in accession order and according to their formats or according to a subject classification.	Materials are organized according to principles of provenance and original order. Archivists try to retain the organization imposed by the creator(s) of the collection.
description	Material is described on an individual level (e.g., catalogue record for a single book).	Archival materials are usually cataloged at a higher level of aggregation, such as the collection or series.
	Most categories of the record are predetermined by the author/publisher and can be retrieved in the object itself. In addition, libraries can use copy	Archives cannot usually benefit from shared cataloging data; virtually all archival materials must receive original cataloging.

	cataloguing, as there are copies of the same item in other libraries.	
accessibility	Materials are in open or closed stacks or available online. They are accessible for loan, in-library use or electronic use.	Materials are in closed stacks and must be accessed on site. Only select materials are available online. Access to certain information may be restricted.
preservation	Not every item must be preserved. Most libraries can weed the collections, when materials are no longer needed for the clientele. Multiple copies of media allow sharing the preservation task (digitization, deacidification).	Archives keep their collections for posterity. Therefore every item must be housed and preserved safely. Surrogates help to preserve originals.
Usage		
population to be served	Usually a clearly defined population: the inhabitants of a community, or the members of a university. Some general research libraries serve the whole research community.	Generally everyone with research needs as to materials of a specific archive.
user activities	Primarily information seeking, whether via the library's collections or the Internet. But libraries are also used as places for working and learning and as public meeting spaces.	People visit archives primarily for looking into archival materials.
visits	Library users are for the greater part frequent visitors, especially during certain times of life (children, seniors, students).	People usually visit an archive only as long as they need the material for a specified purpose.
help services	Many people come to a library with a simple information need that can be met by the library's catalogues, by the presentation of the collection or by a simple interaction with a reference librarian.	Most people come to an archive with complex information needs that require more extensive interactions with one or more archivists.
Public outreach		
research	Research by staff based on the collections is for the most part restricted to libraries with rare or special collections.	Research and publications about topics represented in the archive's holdings, either by staff or by researchers visiting the archive.
educational activities	Learning materials and programmes in all formats for children and adults for the purpose of enhancing skills in library and information use.	Guided tours and other activities for students and school classes for the purpose of showing how to use the specific archive.

events	Exhibitions are important for promoting rare or special collections, but libraries organize many other events, often not related to the collections.	Archives organize exhibitions and events related to the archives' holdings.

The comparison shows that archives show the highest similarity to libraries with rare or very specific collections, with a mandate to preserve those collections and with usage concentrating on research. Cultural and educational activities that have come to engross a high percentage of many libraries' resources today are still more like a by-product in archives, but it must also be admitted that archival holdings at first sight can be rather uninspiring materials that need specific effort for arousing public interest.

Quality criteria for archives

Archives are long-term institutions, working for the future. "Good" archiving shows in 50 or 100 years; archivists work quasi for their successors. In many cases, archives' tasks are prescribed by legal regulations. That makes the archives secure in their establishment: no competitors, nearly no external pressure to work cost-effectively - and success will show later. But the regulations also limit the possibility to change or modify the tasks; archives cannot pick the institutions whose materials they collect.

There are a number of quality criteria that would be relevant for nearly all types of institutions, whether commercial or non-commercial:

- *competence and helpfulness:* well-trained, friendly and responsive staff with high communication skills

- *accuracy and reliability:* products and services delivered consistently, correctly, reliably

- *speed:* products and services delivered with adequate speed

- *ease of access*: access to the building and to all services should be quick and easy (e.g. adequate opening times, usability of the website, easily understandable language in all texts the archive publishes)

- *cost-effectiveness*: well-organized processes, products and services produced with a minimum of resources

- *staff development*: systematic training for all staff members

Quality issues for the specific tasks and functions of archives can be seen as follows:

- *consistency*: Appraisal methodologies and decisions should be documented, comprehensible and trackable.
- *integrity*: The records that the archive has collected should be sufficient to give a coherent picture of the creator (institution, organization, person).
- *retrievability:* The description of archival items should be adequate, timely and comprehensive. Finding aids should be online.
- *accessability*: Materials should as far as possible be digitized and accessible on the Internet.

- *visibility:* The holdings should be promoted by publications, events and educational services.
- *stability:* The holdings should be in stable condition, suitable for – careful – use.

Possible performance indicators for archives

This paper focusses on indicators in the sense of ISO 11620. That international standard defines a performance indicator as "numerical, symbolic or verbal expression derived from library statistics and data used to characterize the performance of a library".
Archives have begun to discuss key data and indicators that might be used for assessing the "goodness" of archival activities (see e. g. Glauert, 2009). The national archives of Australia and of the UK in their annual reports use specific performance indicators to show whether they reached their annual goals (The National Archives, 2018; National Archives of Australia, 2015-16).
The following list of indicators is in no way complete, but a first attempt to show how quality indicators can be assigned to the goals and tasks of archives. The indicators were found in the sources named below, but were partly adapted to the terminology and activities of archives.

- Glauert, M. (2009), „Kennzahlen und Benchmarking für Archive", *Brandenburgische Archive* 26, pp. 25-33.

- ISO 11620:2014, *Information and documentation — Library performance indicators*

- ISO 18461:2016, *Information and documentation — International museum statistics*

- ISO/DIS 21246: 2019, *Information and documentation - Key indicators for museums*

- LISU (2005), *Digest of statistics for museums, libraries and archives.*

- National Archives of Australia (2016)*, Annual performance statement 2015-16.*

Aspect	*Indicator*	*Source*
Awareness	Percentage of survey respondents that know the archive	ISO/DIS 21246
	Percentage of survey respondents agreeing that archives contribute to society by preserving our culture and heritage	LISU
	Percentage of survey respondents agreeing that archives contribute to society by providing opportunities for learning	LISU
	Percentage of survey respondents agreeing that it is important that the community has a local archive	LISU
Visitor satisfaction	Visitor satisfaction	ISO 11620
	Willingness to return	ISO 11620

	Percentage of visitors who would recommend a visit	ISO/DIS 21246
	Percentage of increase in visits (including virtual visits)	ISO/DIS 21246
Collection: description	Percentage of the total collection described at archival unit level	Australian archives
	Percentage of all archival units for which searchable records are available on the Internet	ISO 11620
	Percentage of units acquired during a year that have been described during the same year	Glauert
Collection: digitization	Percentage of the collection digitized	ISO 18461
	Number of online accesses per digitized archival unit per year	ISO 11620
Collection: preservation	Percentage of the collection in stable condition	ISO 11620
	Percentage of records needing conservation/restoration treatment that received such treatment	ISO 11620
	Percentage of storage space which has an appropriate environment	ISO 11620
	Percentage of the collection protected by boxes or other forms of enclosures	Glauert
	Percentage of the collection for which surrogate media (e. g., microforms, digital copies) are available	Glauert
Services	Median time of document retrieval from closed stacks	ISO 11620
	Speed of reference transactions	ISO 11620
	Percentage of reference enquiries responded to within 30 days	Australian Archives
Education and events	Number of attendances per event	ISO 11620
	Satisfaction of attendants with educational events	ISO/DIS 21246
	Percentage of increase in schoolchildren's visits	ISO/DIS 21246

Research	Number of research publications per professional staff member	ISO/DIS 21246
Management	Archival units described per staff member (FTE) per year	Glauert
	Metre of shelving per staff member (FTE)	Glauert
	Percentage of staff time spent on cooperative partnerships and projects	ISO 11620
	Number of attendance hours at formal training lessons per staff member	ISO 11620

The indicators shown here stress the archival task for the collections: description, preservation and especially digitization for enhancing accessibility. Such indicators are known from the library sector.

It is not so easy to identify indicators for use and user services in archives. Usually there is a long time interval between the acquisition and description of archive material and its use by interested persons. Therefore archives can only marginally adjust their selection policies to potential user interests. The usage of archival material eventually depends on outside trends that the archive cannot influence, e. g. political events, social or cultural developments, new topics in research. Archives can only partly foresee such trends.

The quality of archival appraisal

Apparently, there is as yet no convincing proposal how to assess the quality of archival appraisal – and yet that is the crucial action that decides on the future reliability and usefulness of an archive. How can it be proved that an archive, when selecting materials of a specific institution, has chosen the right ones and rejected those that would not be missed in a complete picture of that institution?

At first sight, there seems to be a similarity to national libraries that also have a defined strict collecting mandate and have to preserve their collection. But the difference is: The national libraries, with only diminutive exceptions, have to collect just everything published in their country – which makes it easy to assess whether they have done right. If their collection is comprehensive, if possible complete, they are evidently "good". The ISO standard for quality indicators of national libraries (ISO 21248) describes several indicators for this question, which can be used for the topical collecting policy.

The quality of archival appraisal can probably only be assessed after some time, when researchers or other interested persons are searching the archive for specific topics or documents. The users might be questioned as to issues such as:

- Did you find the specific documents you were seeking for?
- Did you miss certain documents that you would have expected to be in the archive?
- Did you find material for a specific topic?
- If not, would you expect such material to have once existed?
- Do you miss certain aspects in the overall view that the archive of this institution should give?

These or similar questions might help to see whether the relevant documents have been collected. But while libraries can usually fill gaps in their collections by acquiring originals or copies, when archives find out that they have rejected important items, it will be too late – their documents are unique. They could only try to refine the appraisal methods for the future.

I should like to end with the example of an institution that we all know: this conference. **LibPMC,** former Northumbria International Conference on Performance Measurement in Libraries, started in Newcastle in 1995 and has gone on bi-annually via locations such as Pittsburgh, Stellenbosch, Florence, Durham, York and Oxford to the now 13th conference. Some documents of those many conferences are available, above all the proceedings, but there is certainly no comprehensive collection if anybody should want to write the history of LibPMC.

What could have been collected for each individual conference?
- call for papers
- conference programme
- abstracts of papers and workshops
- guidelines for presenters, authors, moderators
- registration details
- list of board members
- list of sponsors
- delegate list
- minutes of board meetings
- local information
- website contents (various stages)
- photos
- financial plans …..

But what about the goings-on between the conferences, the considerations whether and how to keep up the tradition? And should we even retain the endless mail discussions of the editorial board about all sorts of things? It is not unusual that during the preparation of the conference we miss papers, guidelines or calculations that we once had.
Evidently, even such a small casual "archive" needs clear rules about collecting and rejecting – and an institution that continually takes care of the collected items.

What archives need for assessment

The prior need is evidently an international agreement about statistical data for archives: definitions, scope of data and procedures for collecting and analyzing the data. There is still much insecurity, e. g. how to define and measure linear meters of shelved materials. Hopefully, the ISO standard in progress (ISO NP 24083) will solve most such problems, so that joint and comparable statistics become possible.

The second step could be to identify indicators for effectiveness and efficiency of archives' performance. The list given above tries to show that such indicators can be found in library and archive literature.

But as archives can only partly influence usage and as even good performance might not lead to higher usage or higher satisfaction of the users, it will be most interesting for archives and

their funding institutions to identify a positive impact of archive use, whether via physical or virtual visits:

- on the individual user: information gained, success in research, study, or career,
- on society in general: free access to information, support of local culture and identity, social inclusion and cohesion, preservation of the cultural heritage.

Archives have begun to develop methods for identifying their impact in addition to output data (see e. g. The National Archives, 2016). A future ISO project on quality assessment of archives should combine both performance measurement and impact assessment, similar to the new ISO standard for national libraries (ISO 21248).

I apologize if I have missed some points in describing tasks and quality issues of archives, though I had the possibility to discuss this with German archivists. It is a new topic for me, but after chairing SC 8 for 10 years, during which time we revised and initiated a number of quality assessment projects for libraries and museums, I thought that archives should not be left out.

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ISO 2789: 2013 Information and documentation - International library statistics

ISO 5127:2017 Information and documentation - Foundation and vocabulary

ISO 11620: 2014 Information and documentation - Library performance indicators

ISO 16439: 2014 Information and documentation - Methods and procedures for assessing the impact of libraries

ISO 18461: 2016 Information and documentation - International museum statistics

ISO/DIS 21246: 2019 Information and documentation - Performance indicators for museums

ISO 21248: 2019 Information and documentation - Quality assessment for national libraries

ISO/NP 24083: 2019 Information and documentation - International archives statistics

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What is a University library?

Insights from five years of assessment at the University of Oxford

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Abstract

The Oxford English Dictionary defines a library as "A building, room, or set of rooms, containing a collection of books for the use of the public or of some particular portion of it, or of the members of some society or the like; a public institution or establishment, charged with the care of a collection of books, and the duty of rendering the books accessible to those who require to use them." Such a definition no doubt chimes with the views of the average person when they think of a library. However, it is one that librarians have been struggling to change for decades, including a move to re-name libraries in educational settings as learning resource centres.

Wikipedia provides a definition that may be more acceptable to the library community: "a collection of sources of information and similar resources, made accessible to a defined community for reference or borrowing. It provides physical or digital access to material, and may be a physical building or room, or a virtual space, or both." While this implies that a library may be entirely virtual, in universities the concept of a library is still tethered to a physical space. And in 2019, physical libraries still contain physical books.

University libraries in the 21st century have few, if any, physical journals as they are provided online. Although the death of the book has frequently been heralded, much like Mark Twain, reports of its death are an exaggeration. Nevertheless, with the changing nature of scholarly publishing it is possible to imagine a not-too-distant future where a university library does not need to provide any physical books to support the learning and research endeavours of students and faculty.

We know that the library as a place is and will continue to be important for students. The narrative so far has been that these are two separate provisions - provision of information resources (whether physical or electronic); and provision of study space. However, the reality is that these two provisions have been inter-twined: physical resource provision runs through, literally, study space provision.

What will happen if there is no physical information resource provision? Will a university library still fulfil the function of providing study space that facilitates quiet, independent study that is away from distractions but not isolated? Five years of user research at the University of Oxford suggests that the answer is "No".

A library's 'USP' as a study space is that it provides something that cannot be found elsewhere. That silent, studious atmosphere is perpetuated not by what the space is called, or signage and instructions posted on the walls, but by the culture of the people using it.

Culture is made up of the customs, traditions and values of a community. These come together to form a shared set of underlying assumptions, which drive behaviour. These underlying assumptions manifest as observable artefacts, which, in organisations, include everything from the physical layout of spaces, the dress code, the manner in which people address each other, the feel of the place, and its emotional intensity. These cultural cues reinforce the cultural values and underlying assumptions of the community, and so exert a powerful influence on behaviour

The user research reported in this paper indicates that the key artefact that indicates a library is a studious place is books on the shelves. Books on shelves = library = place to concentrate and work.

This implies that university libraries of the future may need to use 'stunt' books or trompe l'oeil wallpaper as decoration in order to make a space feel like a library, so they can continue to provide study space that meets the needs of their students and faculty.

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