Board 103: Developing a User Experience Study (Work in Progress)

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Abstract

The Lichtenberger Engineering Library is interested in examining how people interact with physical spaces and services to discover trends, high use points, and needs. To accomplish this, the library has begun the process of developing a multi-phase user experience study. The path to performing a user experience study starts long before doing any work.

First, a review of user experience studies was conducted. This review looks at a wide variety of literature to determine best practices and to establish procedures for the upcoming study. Some best practices gleaned from the review include identifying the library's mission or what is the overarching purpose of the library service. Next, determining objectives that meet the mission statement. Finally, developing indicators that demonstrate if the objectives were being met.

The literature review allowed the researchers to understand the data collection process. Libraries naturally collect data – gate count, circulation statistics, event attendance – that can be used as indicators. However, developing tools to augment these traditional metrics is a challenge. The tools that a library can implement are endless - surveys, interactive displays, floorplan mapping, focus groups, etc. Reviewing previous studies allows the researchers to work on matching up the correct tool with the indicator to justify its inclusion in their forthcoming study.

Overall, the process from deciding to perform a user-experience study to conducting a user-experience study is lengthy. The authors hope that this review could inform what that process looks like and act as a template for implementing future studies.

Introduction

Libraries currently exist in a world of opposing forces. They are experiencing budget cuts from states and institutions paired with rising materials and subscription costs, staff shortages, supporting staff with cost-of-living increases, and many other expenses. While at the same time, the library users have changing needs that require the library to evolve. The library works to meet these needs and continues to create spaces that give a sense of welcoming and belonging. Decisions related to changing the library space need to be carefully thought-out to ensure the viability of the library and relevancy to the library user.

There are three broad steps to decision making: pre-work, observation, and implementing [1], [2]. Pre-work involves identifying areas of concern and opportunities. Observation is the generation of data, finding relationships between problems and the source, and increasing understanding around the issues or area for growth. Finally, implementing is the decision based off the observations to implement a solution to resolve the initial concern or opportunity. It is possible to move between these steps repeatedly, if the observation step identifies a previously unknown underlying issue that needs to be resolved before a decision can be made one might

return to the pre-work stage. Or, if the results of observation do not provide evidence to support implementing a solution a new tool might be required for further study.

There does not exist a one-size-fits-all approach for collecting data to aid in the decision-making process. The intent of this paper is to explore some often used, but loosely defined, terms that are useful in the pre-work stage and introduce a few designs for data collection. The researchers are planning to use these instruments in a future user experience study. This user experience study will be used to make decisions around space designs and services offered in the library.

Defining of Goals and Terms

The Lichtenberger Engineering Library is a branch library embedded in the University of Iowa College of Engineering. The College of Engineering consists of six academic departments and over twenty research laboratory sites. Undergraduate enrollment is around 1700, approximately 275 graduate students, and 110 faculty members [3]. This project started with the questions of "are we meeting the needs of those we serve?" and "are we using our resources and space effectively?" However, as the conversations progressed there was no straightforward way to answer those questions and one of the first major hurdles was to define what was being discussed. The library must understand how assessment, library services, and impact exist in the context of this study to begin the development of a user experience study.

Libraries naturally collect data such as gate count and circulation statistics as part of their regular operations. Frequently these data points are used to discover trends, gauge performance, and justify decisions [4], [5]. To answer the questions of this project requires active data generation rather than these more passive tools.

The ideas of user experience research and assessment stress the importance of having the library patron, or user, at the core of the data collection rather than the data that is collected and analyzed as a proxy for the user's interaction [4]-[6]. Priestner [6] argues that user experience research needs to be ongoing and make strong connections with users to better understand their library interactions. Assessment is best considered as quality control of services offered – what works and what can be improved [7]. The collection of data is not assessment, but it becomes assessment when the data is analyzed [1], [7].

It became necessary to define what a library service is so that user experience research and assessment could be designed around them. Librarians have reference interactions, provide ILL services, order and maintain collections, lead instructional sessions, and many other tasks. However, as these tasks change and evolve with new priorities, recent technologies, and ever-changing users, it would not be beneficial to attempt to develop an exhaustive list. A service can be defined as a fluid interaction between users, employees, and technology that is intangible [2], [8]. For example, if you think about a reading chair as a piece of technology and an employee puts one in a corner that a user then sits in. The act of providing a chair is a library service as it facilitated an intangible interaction between the staff and the end user. This framework allows

the authors to consider the physical space, furniture, and its arrangement as services that can be evaluated in addition to the standard services that libraries are known for.

Impact is broadly defined as any effect the service has on an individual, group, or community [9]. An impact can be positive, a student can complete necessary homework, or negative, a user avoids the library because they had a negative interaction with a staff member. Impact can be intentional or accidental. Individuals display impact in their quality-of-life and outcomes – be it educational, gaining skills, or increased levels of knowledge. Quality-of-life impacts are displayed in a user's self-esteem and confidence in interactions.

After defining these terms and ideas it becomes possible to articulate what the library is trying to accomplish. The questions of "are we meeting the needs of those we serve?" and "are we using our resources and space effectively?" can be answered by conducting user experience research and assessment to determine the impact of library services.

Mission, Objective, and Indicators

The literature [1], [4], [7] makes the argument that data collected must have a use and an end goal in mind; not just collected for the sake of collection. Markless and Streatfield [9] go into detail for a framework to begin to think about data collection purposefully. Their approach has three steps – having or writing a mission, developing objectives, and determining indicators.

Step one is having or writing a mission statement [9]. Library systems, colleges, and universities have different and unique mission statements. For this step it is not necessary to create something new just using what exists as a place to begin. The mission statement(s) should act as a focus area for where the library can have an impact. The Engineering Library is in two spheres of influence, the broader University of Iowa Libraries system and the College of Engineering, therefore any service evaluated should serve both missions.

With a broad generic mission statement, the next step requires the development of specific objectives [9]. These objectives should be realistic as these are the goals the organization will strive to achieve. What areas can be reasonably impacted, guidelines and restrictions from broader society and institutions the organization exists in, and financial constraints all must be considered when drafting objectives. This step is meant to focus on desired outcomes and if successfully achieved, it is possible to say the mission statement is met. Markless and Streatfield advise writing two to four objectives that are reasonable to obtain in the upcoming one to three years to not spread efforts too thin [9 p. 77].

The last step is to determine indicators of impact [9]. This is the time to consider the types of data collected, not necessarily how it is collected. Two or three indicators per objective should be identified, indicators are items staff are actively doing and can be written as a statement or question. Indicators are not permanent and can be updated or revised if it is decided they are not the best for the objective. Overall, the indicators should be measurable, clear, and concise.

Example of Mission, Objectives, and Indicators	
Mission	The University of Iowa Libraries advances direct engagement in learning, research, creative work, and clinical care through staff expertise and exceptional collections on our campus and worldwide
Objective	Collaboration between faculty and library staff to increase interactions with academic departments
Indicators	• Library staff are entering new classrooms to provide instruction. • Is the library part of the onboarding process for new faculty members? • Workshops are developed in partnership with departments to enhance student engagement.

Tools For Assessment

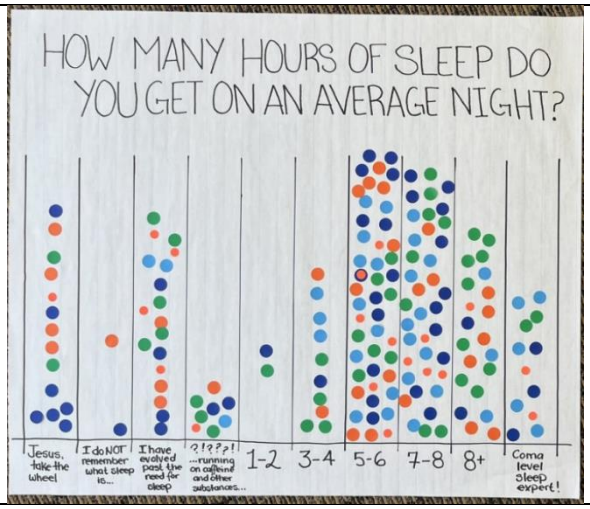
Finally, after agreeing on the study's goals and reviewing the mission statement to create objectives and indicators, it is necessary to consider how the data for the indicators will be collected. Tools can range from data already collected and available, surveys, interactive displays, photovoice studies, focus groups, card sorting, to space mapping.

The best place to start is considering tools to review the data that are already collected and available. In the above example, data on how many workshops and instruction sessions provided, and which departments they were from, could be used and are collected for annual reports. Other tools currently available in libraries that could be used for this process are gate counts, circulation counts, and reference interactions statistics.

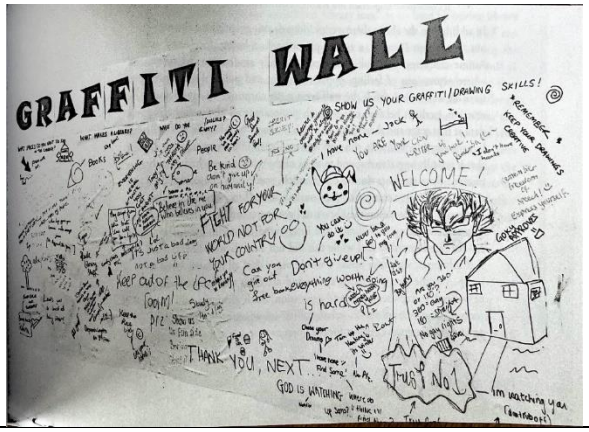
Surveys sent out via email and posted on library websites are a frequently used tool as they can collect information from many people with limited staff interaction. A survey is a quantitative, attitudinal tool to collect specific information through a sequence of questions [6], [9]. Markless & Streatfield provide a few key points as an introduction to begin guiding people to create meaningful surveys and questionnaires [9 pp. 130-136]. They stress the importance of having well-structured surveys, that are free of library jargon and sloppy wording, with clear instructions that have been pilot-tested prior to its release. One useful way to structure a survey was implemented by the University of Florida. Prior to a renovation of the science and engineering library they developed a survey that consisted of fourteen adjective pairs that were used to understand users' perceptions of the library currently and their desired space [15]. Adjective pairs, such as "Quiet" vs "Noisy," were rated along a five-point Likert Scale to indicate which adjective was accurate to the current space and which one they would prefer in a redesigned library i.e., Strongly Quiet = 1, Neutral = 3, Strongly Noisy =5 [15]. Then the survey results were used to guide the design of the new floors in the library. Potential drawbacks to surveys are that they can reflect the preconceptions of the designer [9] and focus only on what the respondents say and think they need and not what they do [6]. There are countless articles, books, and professional services to aid their development and administration [12]-[14].

Another tool that does not require extensive staff involvement is interactive displays. These can also be known as graffiti walls [6]. On a large paper or whiteboard library staff can ask either

specific or open-ended questions and offer a space to invite feedback. These have the advantage of being open-ended, anonymous, and capture the ideas of those who are physically in the location. Staff can gauge interaction based on the number of responses received [10]. One disadvantage is that it does not capture feedback from those not physically in the library space when it is displayed. It is recommended it be checked at least twice per day to respond to questions or concerns and if needed, replace the sheet, or remove problematic or insensitive comments [6]. Photograph the wall before replacing the sheet or erasing the whiteboard to record the responses for future analysis. Future analysis could include grouping similar comments to identify widely held beliefs or identifying points of concern that need to have a priority in addressing.



Interactive display created by J. Condlin and M. Zogas for the University of Dubuque Charles C. Myers Library [10]



Graffiti Wall inviting open ended text and art feedback [6]

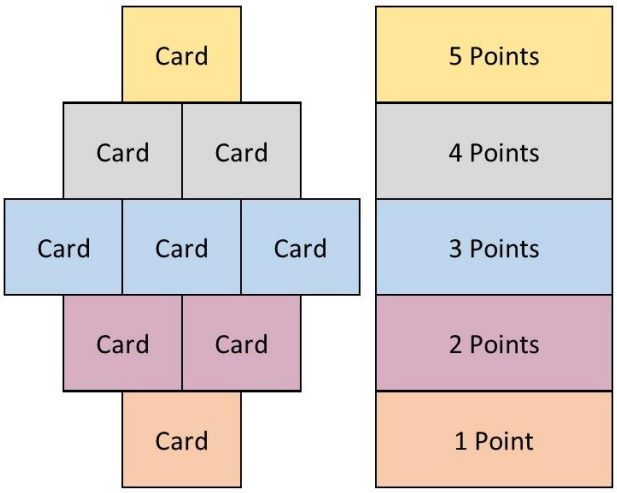
A photo is worth a thousand words and inviting users to photograph themselves or their work in the library can be a powerful way to understand how they view library services. Photos engage more emotional and creative parts of the brain from the users providing unique information that is difficult to capture via text or verbal interactions [6]. The Photovoice method invites users to submit photos responding to specific prompts that address the research questions and then using focus groups to discover themes and trends [11]. Images are submitted via a web form and students are invited to create a caption for their image. Then using the notes from the focus group and the images a researcher can code the information to explore the initial research questions.

Example of Photovoice Research Question and Prompt	
Research Question	Do reference services contribute to increased student learning
Photo Prompt	What aspect of the library is most useful or helpful to you? (Consider all aspects, physical or online resources, services in the building, online, or in class, etc.)

Text examples from presentation [11]

Focus groups encourage conversation between peers so researchers can learn their thoughts and opinions. A potential way to structure those conversations is either open or closed card sorting. Card sorting asks a group a broad question such as “what are the strengths of the library” and individuals arrange cards using a category tree [6]. Open card sorting is when the focus group is handed a blank set of index cards or sticky notes and invited to write down whatever they choose to. In a closed card sorting conversation, the cards are already filled out by the researchers and the group organizes them. A variation of this is the nine-diamond task [9]. In this format a group is given a mostly closed deck, with a few blank cards, and are asked to reject all but nine as the most relevant to answer the broad question. Then using those nine cards to create a five-tier list descending order of importance or priority creating a diamond shape, see image below. This method has the advantage of quickly identifying what participants feel are the most important aspects without the need to extensively discuss the middle items where it might be difficult to assign a specific order. In the nine-diamond method it is possible to assign weighted values to evaluate across many focus groups. With items in the first tier receiving five points and points decreasing down to one point for items in tier five. Combining weighted values to create a master list to overall identify what received the most points as being valuable to the groups compared to those items that receive little to no points. This list can aid in analysis of areas of strength or needed improvement.

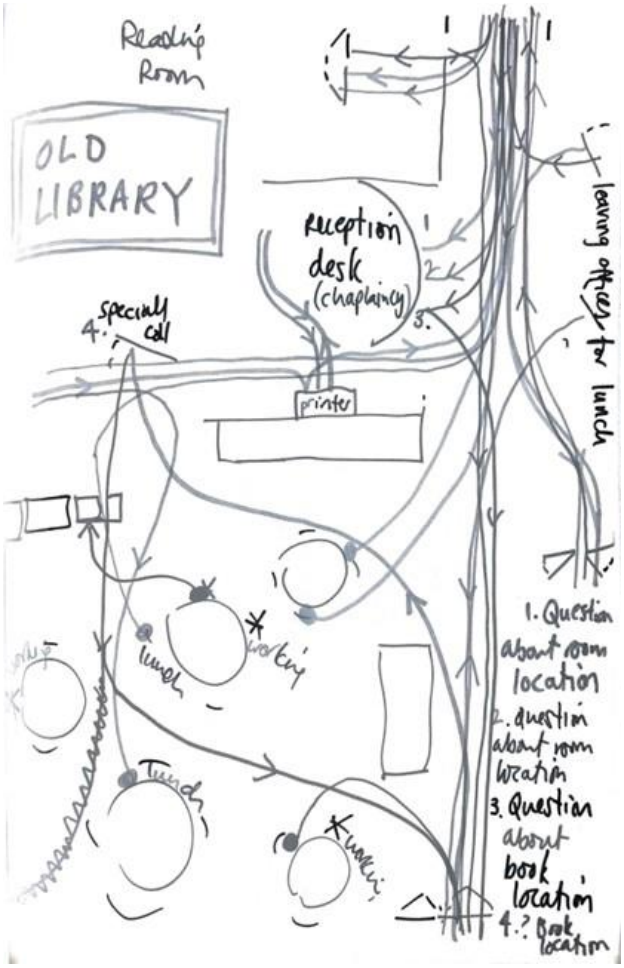
Card Sorting Format and Weighted Points:



Finally, the type of data collection that requires the least engagement from library users is direct observation. The concept of space analysis documents how individuals move through the space, their destination, and the activities performed when they get there [2]. Behavioral/floorplan mapping is a way to structure an observation session and involves sitting out of the way with a floorplan of the space and drawing a line to indicate where people walk and stop. It is advised to do this for one-hour sessions then repeat on different days and times [6]. Adding one line to the floorplan for each person, monitoring where they stop and, if the action is clear, making notes of why they stopped to indicate how the space is used. After several sessions, desire lines will become apparent, indicating where most people walk and what services they interact with.

Additionally, this method might indicate there is a change that needs to be made via people walking around an obstacle in the path.

Example of behavioral/floorplan mapping [6]:



No one tool will provide all the information required to have a complete picture of library services from a user's perspective. However, it is possible to better understand their experience and make informed decisions when multiple instruments are used to collect a wide variety of data.

Next Steps

The information from this literature review will be used by the Lichtenberger Engineering Library to develop a user experience study. The over-arching goals of this study are:

- Examine how people interact with the library physical space and services to discover trends, high use points, and needs. This includes closely examining what and why spaces, resources, and staff are being used.
- Generate data that can be used to drive decision making in the library space, services, resources, and marketing & communication

- To establish a format that could be repeated every five years to evaluate trends in the space and examine how changes influence users' interactions

Using the framework outlined above, at the time of writing the authors have begun to consider how the University of Iowa Libraries' mission statement and College of Engineering' mission statement can be combined to create a working, but unofficial, mission statement for the Lichtenberger Engineering Library as follows.

University of Iowa Libraries' Mission Statement

> The University of Iowa Libraries advances direct engagement in learning, research, creative work, and clinical care through staff expertise and exceptional collections on our campus and worldwide.

College of Engineering Mission Statement

> To build an inclusive, diverse, and responsible community recognized for:
>
> - Providing an accessible, modern education in engineering and science for future, interdisciplinary leaders.
> - Advancing knowledge through fundamental and applied research.
> - Facilitating life-long learning and economic development

Lichtenberger Engineering Library Working Mission Statement for Library Space

> To be a space that advances direct engagement in learning, research, and creative work by providing adaptive spaces and the resources to support research, discovery, innovation, and lifelong learners.

From this working statement the authors have developed the following objectives

- Library users feel comfortable and welcome in the Engineering Library
- A variety of seating options to accommodate learning, research, discovery, innovation, and lifelong learners.
- Quick and easy access to materials, resources, and space to aid library users' learning, research, discovery, innovation, and lifelong learners.

The next steps will be to identify indicators and develop tools used in the assessment. All the tools outlined in the paper are under consideration as instruments in this forthcoming study. Once they have been developed, the information will be submitted to the campus IRB (Institutional Review Board) for review.

The authors will conduct research during the fall 2024 semester and intend to publish the results for the 2025 ASEE (American Society for Engineering Education) Annual Conference.

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