Evidence Based Library and Information Practice

Research Article

LibGuides or Bust? Usability Testing Platforms for Research Guides

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Abstract

Objective – The purpose of this study was to compare student use of two library research guides, one created in Springshare's LibGuides platform with a multi-page layout and one created using a single-page Adobe Express website. The researchers sought to explore how LibGuides' library-first design and embedded features would enable successful student navigation versus Adobe Express' simpler, website-style layout that might be more familiar to users yet lacks the ability to integrate fully with the broader library Web presence.

Methods – The study used a qualitative usability test to answer the research questions. Two groups of six users each were assigned to complete tasks using one of the two platforms.

Researchers designed test guides for the study mirroring real-world content and layout, following best practices of design and institutional guidelines within each system. During test sessions, users followed a "think-aloud" protocol, allowing researchers to transcribe and code comments to identify patterns in students' feedback. Pretest and posttest questionnaires were also used to assess participants' prior experience and subsequent perceptions.

Results – Users' posttest responses indicated they found both guides easy to use. However, there were a few differences between their use of LibGuides and Adobe Express during the sessions. Users of Adobe Express commented favorably on its clean aesthetic, though users appreciated both guides' collation of resources. Adobe Express users experienced higher rates of task success, fewer instances of confusion, and a clearer differentiation between the guide and broader library resources. Many themes that surfaced in sessions related to user behaviour overlapped between the two platforms, such as a preference for searching over browsing, gravitation toward familiar tools, and not reading all content.

Conclusion – Neither guide fully enabled universal task success, and each brought its own set of challenges for users. Moreover, users in both test groups failed to fully engage with all content. Librarians designing research guides should consider the context and purpose of creation, as well as users' existing information literacy skills and mental models, when selecting platforms, layouts, and designs.

Introduction

Academic libraries serving large, research-oriented institutions utilize various online tools to address their users' information needs. One notable resource primarily associated with such libraries is research guides, which are specialized online pages featuring curated resources and advice for starting the research process.

Auburn University is an R1 land-grant university located in eastern Alabama, with an approximate enrollment of 34,000 students, the majority of whom are undergraduates. The Auburn University Libraries (AUL), a member of the Association of Research Libraries (ARL), has been developing and maintaining research guides for all users, particularly undergraduate courses, and promoting these resources in classroom instruction since the late 1990s. In those early days of the Internet, like many libraries at that time, AUL utilized a homegrown system to develop and manage subject guides. In 2010, AUL transitioned to the Springshare product LibGuides—a decision they have fully embraced ever since.

In 2018, with funding from the Office of the Provost, Auburn University was designated as an Adobe Creative Campus, providing students with free access to the Adobe Creative Cloud, along with discounted subscriptions for faculty and staff (Hooper & Lasley, 2022; Office of Communication and Marketing, 2018). Units across campus began to integrate Adobe products into assignments and internal workflows, although Adobe Express is not maintained centrally by the library, and so the full count of guides created within it is unknown. Beginning in 2019, AUL initiated workshops focused on Adobe products and began actively promoting various Adobe classroom tools, including Adobe Express, to course instructors as a resource for course webpages and assignments (Hill, 2022). Adobe Express is a user-friendly, cloud-based tool for generating digital content such as websites. Following 2020, having

received training in Adobe products and prompted by this widespread use, newly hired librarians at Auburn University were inspired to try out this new tool for an essential library asset: the research guide.

LibGuides, a library-specific software, facilitates seamless access to library resources and collections. However, students' familiarity with Adobe Express might lead to better ease of use because they do not also have to learn the tool itself. Design options and best practices differ between the two systems. Given these differences, the current project seeks to compare students' navigation of research guides created in LibGuides and Adobe Express through a usability study.

Literature Review

Adobe Express History and Evolution

Adobe Express is not a library-specific software; it's one of many tools produced by the parent company Adobe. Formally launched in 2021, Adobe Express is an updated version of their earlier Web-based creation tool called Adobe Spark, offering pre-built templates and user-friendly customization options for creating digital content such as flyers, slide decks, photos and videos, infographics, and webpages (Sharma, 2021). Webpages are created and hosted within the Adobe Express platform, formatted as single pages but can include anchor links to help users navigate, and limited in their ability to integrate multimedia content and external embedded content (Adobe, 2025). Though its tools are not exclusive to libraries or universities, Adobe does actively pursue higher education partnerships, positioning itself as an ally in the advancement of digital literacy skills (Adobe, 2020), and Auburn University's own partnership is an expression of this goal (Bohmholdt, 2023; McCavitt, 2020). Because libraries do not currently widely use Adobe Express for research guide creation, there is a gap in the literature on this platform's potential use in research guide design. The majority of recent literature focuses on LibGuides, therefore so does this literature review; however, many of the themes related to student preferences in navigation and user behaviour could be applied to Adobe Express webpages as well.

LibGuides History and Evolution

LibGuides originated from pathfinder-style research guides that were print, static, and served primarily as curated lists of suggested resources, differing from standard bibliographies in their purpose and scope (Stevens et al., 1973). From the 1990s onwards, guides moved online and shifted toward new Web-based features such as databases, graphics, and tagging—even as the time and training required to work in these new technologies increased (Morris & Bosque, 2010; Smith, 2008; Vileno, 2007). Utilizing Web 2.0 capabilities, library technology company Springshare launched its LibGuides product in 2007, offering a streamlined, easy-to-use tool for online guide creation (Emanuel, 2013). The LibGuides platform allowed librarians to create content online without advanced HTML skills, embed images and widgets, and integrate guides with the broader library Web presence. LibGuides 2.0, launched in 2014, expanded these toolsets and added features like search boxes, templates, widgets, and a new vertical rather than horizontal placement of subpage tabs (Chan et al., 2019; Coombs, 2015). Today, LibGuides is the predominant platform academic libraries use to create online research guides (Hennesy & Adams, 2021; Neuhaus et al., 2021). According to Springshare, the platform hosts over 950,000 guides across 5,748 institutions (Springshare, n.d.).

Pedagogical Approach

LibGuides can be a rich resource for both in-class and out-of-class learning. Integrating pedagogical principles into the design of LibGuides aligns with the educational goals of the learners, including the incorporation of learning outcomes, lesson plans, the use of the ADDIE model, collaboration with faculty, assignment mapping, and differentiated instruction (Bergstrom-Lynch, 2019; Gonzalez & Westbrock, 2010; Lee & Lowe, 2018; Reeb & Gibbons, 2004). Cognitive load theory emphasizes the need for user-friendly resources that reduce cognitive load to enhance student engagement (Pickens, 2017). German et al. (2017) recommended using precise language, breaking content into manageable segments (Little, 2010) and avoiding lengthy lists. Students have responded more positively to tutorial-style over pathfinder-style guides, indicating that a well-structured learning tool can increase student engagement and efficacy (Baker, 2014; Hicks et al., 2022; Stone et al., 2018). Comparative studies, such as those by Kerrigan (2016) and Bowen (2014), have shown that both LibGuides and traditional webpages can effectively deliver online information literacy content. However, it is essential to critically assess all guides. While some researchers, such as Grays et al. (2008), relied on indirect methods like focus groups to evaluate guide effectiveness, more recent research by Stone et al. (2018) employed a direct measure of students' graded annotated bibliographies.

Mental Models

In the 1990s and early 2000s, information and library science professionals seeking an understanding of users' search behaviours with the advent of webpages and discovery layers began using the term "mental model" in usability studies (Newton & Silberger, 2007; Swanson & Green, 2011; Turner & Belanger, 1996), referring to the conceptual frameworks individuals create to engage with their environment, interact with others, or use technology (Michell & Dewdney, 1998). Librarians typically organize library guides based on their own research process and academic disciplines, while students are more inclined to focus on courses, coursework, and the tangible outcomes of research (Castro-Gessner et al., 2015; Sinkinson et al., 2012; Veldof & Beavers, 2001). Furthermore, creators should consider the specific mental models of different generations (Blocksidge & Primeau, 2023; Matas, 2023). For instance, individuals in Generation Z, who were born from 1995 through 2010 (Pew Research Center, 2019) and have a born-digital approach to information-seeking, primarily seek to address specific information needs (Salubi et al., 2018) and exhibit Google-like search behaviours: preferring to use search boxes, staying on the first couple of pages of results, and skimming text rather than reading thoroughly (Blocksidge & Primeau, 2023; Seemiller & Grace, 2017). Many Generation Z respondents felt overwhelmed during their searches, often continuing to search even after finding relevant sources, perceiving their struggles as a personal failure rather than a flaw in the information structure (Blocksidge & Primeau, 2023).

Student Use and Impact on Students

LibGuides has recently been scrutinized for its effectiveness in addressing these student needs. Research has indicated a disconnect between LibGuides production and student usage, highlighting a lack of student awareness and the need for improved visibility regarding LibGuides (Bausman & Ward, 2015; Carey et al., 2020; Ouellette, 2011; Quintel, 2016). Although responses to LibGuides' perceived utility are mixed (Dalton & Pan, 2014), many students have expressed the willingness to use guides again. Additionally, when LibGuides were embedded in the learning management system (LMS), and students

were aware of them, they found them useful (Murphy & Black, 2013). Ultimately, while LibGuides hold potential, enhancing their design and increasing awareness is crucial for improving their usability and effectiveness.

Best Practices

A major portion of research on LibGuides has focused on formatting guides to increase users' ease of navigation and rates of use. Guides are customizable, allowing librarians to create multi-page guides accessed through tabs either to the top or left-hand side of the page (frequently called side navigation, side nav, or vertical navigation). Research slightly favors side nav (Bergstrom-Lynch, 2019; Duncan et al., 2015; Fazelian & Vetter, 2016; Goodsett et al., 2020). Some researchers found that not all participants noticed the tab navigation toolbar when it was placed at the top (Pittsley & Memmott, 2012; Thorngate & Hoden, 2017), demonstrating "banner blindness" (Benway, 1998). However, others found that user preference and effective use may be more split (Chan et al., 2019; Conerton & Goldenstein, 2017; Conrad & Stevens, 2019).

Research is more consistent on tab number: generally, fewer is better, and the most important content should go under the first tab (Castro-Gessner et al., 2015; Goodsett et al., 2020; Quintel, 2016). Overuse of subtabs, located in drop-down menus underneath main tabs, may also be an issue (Conrad & Stevens, 2019). In practice, however, many universities do not follow this guidance–Hennesy and Adams (2021) found a mean of 8.4 tabs per guide at R1 universities, exceeding Bergstrom-Lynch's (2019) recommended six.

LibGuides also allows authors to choose whether content appears in one, two, or three columns. Findings here are likewise split, with Thorngate and Hoden (2017) finding a slight edge for the two-column design. Conrad and Stevens (2019) found similar success rates across column layouts but noted that their participants gravitated toward searching instead of browsing, which may have affected their interactions. Conrad and Stevens are not alone in this finding, though they and others report student confusion about what exactly integrated LibGuides search boxes are searching (Conerton & Goldenstein, 2017; Conrad & Stevens, 2019; Goodsett et al., 2020).

Simplicity and ease of use is a repeated theme in LibGuides design. Having a clean look, minimal visual clutter, and appropriate whitespace is important for users to not feel overwhelmed by guides' content (Baker, 2014; Hintz et al., 2010; Ouellette, 2011; Sonsteby & DeJonghe, 2013). Several researchers indicated a clear user preference for designs that reduce text-heavy pages and that minimize the need to scroll (Barker & Hoffman, 2021; Conerton & Goldenstein, 2017; Hintz et al., 2010), though some researchers found that text-heavy pages were not as detrimental if they were well-organized (Cobus-Kuo et al., 2013; Ray, 2025). Likewise, research on the benefits of including multimedia or interactive content in guides is split, with Wan (2021) finding they increase engagement and other studies more ambivalent (Cobus-Kuo et al., 2013).

Other LibGuides best practices emphasize reducing library-specific jargon, pointing to student confusion around labeling of basic research terminology in LibGuides (Bergstrom-Lynch, 2019; Conerton & Goldenstein, 2017; Sonsteby & DeJonghe, 2013), as well as broader library resources (O'Neill, 2021). Little (2010) tied this to cognitive load theory, arguing that unfamiliar terminology takes up valuable space in students' learning capacity. Consistency across an institution's guides is also key: standardizing guides in

color, template, and organization surfaces as a recommendation in several studies (Bergstrom-Lynch, 2019; Burchfield & Possinger, 2023).

Problems in Design and Implementation

However, these guidelines and practices are at best unevenly applied. Maintaining LibGuides requires consistent workflows and regular updates, placing a demand on librarian time. Logan and Spence (2021) found most academic libraries leave oversight and updates up to creators, and 47% of surveyed institutions do not have standardized content creation guidelines, leading to inconsistencies. This is echoed in the literature: despite several researchers advocating for cohesive formatting templates within institutions (Almeida & Tidal, 2017; Bergstrom-Lynch, 2019; Burchfield & Possinger, 2023) and the recognition that students desire a seamless experience (Cobus-Kuo et al., 2013), most libraries do not enforce uniformity or regular review of guides. Even when desired, these standards can be difficult to implement (Chen et al., 2023; Del Bosque & Morris, 2021; Gardner et al., 2021; Jackson & Stacy-Bates, 2016). None of these are new issues (Vileno, 2007), but creating and maintaining guides that promote student learning remains a time-consuming process.

Assessment of Research Guides

German et al. (2017) emphasized that assessment is the most frequently discussed aspect within the literature on LibGuides, urging creators of library guides to contemplate the tools and methods they will employ for evaluating their LibGuides. Usability testing is well-documented as a useful method to better understand user experiences with LibGuides (Almeida & Tidal, 2017; Baird & Soares, 2018; Castro-Gessner et al., 2015; Chan et al., 2019; Conerton & Goldenstein, 2017; Goodsett, 2020; Hintz et al., 2010; Thorngate & Hoden, 2017). In addition to usability testing, there are numerous options available for assessment, including focus groups, feedback surveys, student assignment analysis, and page view counts. While Springshare provides integrated data on guide and page views, Griffin and Taylor (2018) utilized Google Analytics to offer a more comprehensive understanding of user patterns and pathways that directed users to their LibGuides. Assessment should be a continual process, with user perspectives sought during both design and implementation phases. Castro-Gessner et al. (2015) observed that librarians often neglect to solicit feedback from end-users regarding guides post-implementation. DeFrain et al. (2025) further highlighted the shortcomings in learning assessment in a recent scoping review that examined guides' effectiveness in fostering students' information literacy skills, shifting the emphasis in assessment from the product to its impact. To improve assessment workflows and learning outcomes, Smith et al. (2023) developed a rubric for evaluating authors' guides, which Moukhliss and McCowan (2024) later expanded on by proposing internal peer review standards and proposing a design and assessment rubric called the Library Guide Assessment Standards (LGAS).

Aims

The aims of this study were to evaluate the usability of research guides created with LibGuides and Adobe Express. We sought to compare student navigation and perceptions of both platforms, using the same content. LibGuides merits study as a library-focused platform extensively used in academic libraries, including the researchers' home institution, especially around whether its features offer advantages for student engagement. However, other platforms may offer viable alternatives for research guide creation. Given the recent use of Adobe Express at the researchers' university, within the context of its status as an Adobe Creative Campus, evaluating this option for research guides had the potential to

enhance student support. Researchers aimed to determine if familiar technology, which students may also encounter outside the library context, might better serve the purpose of linking students to resources and providing basic research guidance.

With the goal of reflecting and assessing real-world use, the study sought to compare research guides mirroring those used for classes at AUL. At AUL, internal guidelines for LibGuides design stipulate the use of a side-navigation, multi-page design, whereas Adobe Express pages exclusively offer a single-page layout. Thus, in the present study, we compared the layouts most often used for class guides within each platform. Comparing these two options allowed researchers to assess whether our institution should retain its current practice, or whether a shift to an alternative platform would be viable.

- RQ1: What issues in navigation do novice researchers encounter when using research guides created in the LibGuides platform?
- RQ2: What issues in navigation do novice researchers encounter when using research guides created in Adobe Express webpages?
- RQ3: Are there features users identify in research guides created in either LibGuides or Adobe Express webpages that help or hinder their discovery of and interaction with library resources?

Since librarians are not the primary users of these guides, understanding student perspectives is crucial for assessing their effectiveness in supporting research. By elucidating pain points for users under each option, in the layouts typically used in real-world practice at the researchers' home institution, the goal of the study was to identify strengths and weaknesses of each platform, in order to help influence decision-making for librarians designing resource guides.

Methods

Usability Testing

To answer these questions, the researchers conducted usability tests on research guides created in both LibGuides and Adobe Express. The usability testing methodology, wherein a small group of users is assigned a set of specific tasks to complete using a platform, identifies system issues and design problems (Nielsen, 2012a). During usability tests, participants are asked to navigate the system naturally, as if unobserved, and to follow a "think-aloud" protocol, where they describe their thoughts and actions out loud (Moran, 2019). A researcher is present to read from a prepared script outlining the study's steps and to facilitate the session, with another researcher present for notetaking, positioned behind participants to maintain a clear view of the screen. The facilitator's role is intentionally non-intrusive, primarily prompting participants to vocalize their thoughts without providing direct guidance, thereby allowing for an authentic representation of their user experience (Moran, 2019). Screen-recording software captures the on-screen navigation and audio commentary for later analysis.

The goal of usability testing is not to highlight user error or skill deficits. Quantitative usability tests utilize up to 30 users to draw statistical inferences. On the other hand, qualitative usability tests are meant to identify overlapping themes of problematic features in platform design, not exhaustively pinpoint every potential issue (Nielsen, 2012a). Consistent with their less formal design and their use of the "think aloud" method, qualitative usability studies often have more "noise" or interactions between

facilitators and participants, which do not invalidate the studies' findings, but which make them more useful for thematic insights than statistical significance (Budiu, 2017; Nielsen & Budiu, 2001).

In standard qualitative usability tests, a small group of five test participants is generally enough to discover most major shared design issues (Nielsen, 2012b). The current study sought five to eight participants to test each platform, providing a cushion for no-shows or technical issues. We used a between-subjects design, where each test group interacted with only one platform, to minimize the influence of one system on participants' assessments of the other (Budiu, 2023).

Recruitment and Incentives

Participants were required to be current undergraduate students at Auburn University and to commit 30 to 45 minutes of their time. Researchers distributed flyers near a busy classroom building early in the semester, offering a $25 gift card to encourage participation, which participants would receive electronically at the start of the study. Interested individuals could register via a Qualtrics form and would then receive instructions from the principal investigator on how to schedule an appointment. Twelve students were ultimately recruited for participation, with six students observed for each test guide.

Research Instruments

Sessions were held in a consultation room in the library during Fall 2023 and Spring 2024. At each session's outset, participants were read a script, after which the screen recording software, Panopto, was initiated. Before receiving the tasks, participants were asked to complete a pretest questionnaire, administered online through Qualtrics (see Appendix A for the pretest survey). The pretest also collected information about class rank, major, and demographics.

A laptop was designated for study participants, with Panopto capturing participants' on-screen movements, audio, and facial expressions. The sessions were conducted using two test guides created in LibGuides and Adobe Express, with content as closely aligned as both systems allowed. The guides modeled a typical freshman-level English Composition course at Auburn University, in which information literacy is a key student learning outcome and library instruction is routinely integrated (Auburn University, 2024). Instruction in these courses is focused on evaluating Web sources, finding reputable sources online and at the library, and managing research projects.

The test LibGuide (aub.ie/usability_test_guide) (see Figure 1) complies with key best practices, including side nav (Bergstrom-Lynch, 2019; Fazelian & Vetter, 2016; Goodsett, 2020), two-column layout (Thorngate & Hoden, 2017), five tabs (Bergstrom-Lynch, 2019), profile boxes on every page (Almeida & Tidal, 2017; Bergstrom-Lynch, 2019; Ray, 2025), a search box (Conrad & Stevens, 2019), and minimal scrolling required (Barker & Hoffman, 2021; Conerton & Goldenstein, 2017; Hintz et al., 2010). Moreover, it employs a multi-page design, reflecting current practice for class guides at the researchers' home institution. Although it is possible to create single-page LibGuides without any tabs, design guidelines at AUL call for multi-tabbed designs to minimize scrolling. To compare potential adoption of Adobe Express guides to current use, researchers designed the test guide following these internal best practices, complying with recommendations in the literature to follow institutional standards when designing guides (Bergstrom-Lynch, 2019; Del Bosque & Morris, 2021).

The guide starts with a "Welcome" page introducing its purpose. The next page, "Evaluating Sources," includes resources for fact checking, criteria for evaluating Web sources, and a section about website domains. The third tab, "Finding Reliable Sources," includes a list of four recommended databases and an embedded library catalogue search. The "Research Tips" tab includes suggestions for organization, a tabbed box covering academic integrity, and a link to Zotero for citation management. Finally, the "Get Help" tab has an embedded LibAnswers FAQ search and a link to the "Subject Librarians" page on the library website.

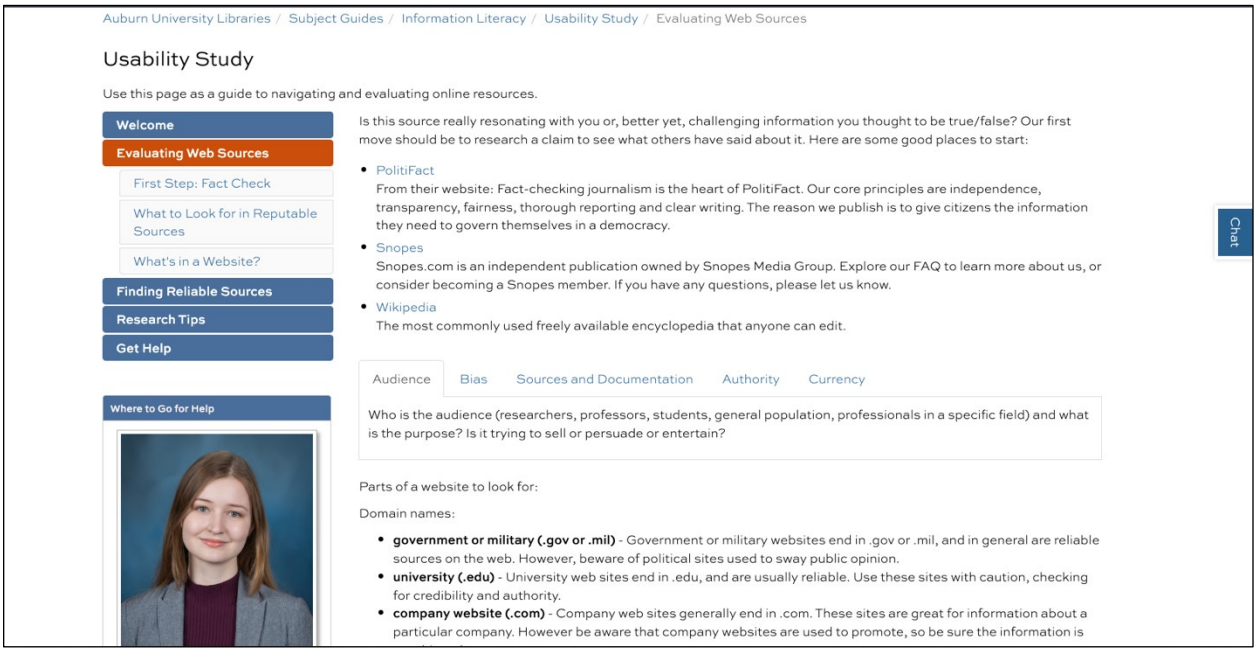

Figure 1
Screenshot of the "Evaluating Web Sources" tab on the test LibGuide.

The Adobe Express test page (aub.ie/usability_test_page) (see Figure 2) contains the same content. However, because Adobe Express lacks LibGuides' embedding and integration features, minor adjustments were necessary. Most significantly, Adobe Express webpages do not allow tabbed designs directly mirroring the LibGuide, but rather everything appears on a single page, making navigation scroll-focused. The guide starts with the same welcome introduction and then uses anchor links to allow users to jump ahead in the text. The section order remains the same: "Evaluating Web Sources," "Finding Reliable Sources," "Research Tips," and "Get Help." Instead of an embedded catalogue search and LibAnswers FAQs, the guide includes links. The database descriptions are written out in full-text instead of pop-up text that appears when hovered over. Content in tabbed boxes is visible simultaneously. Finally, instead of profile boxes, librarian photos and contact information appear at the end of the page.

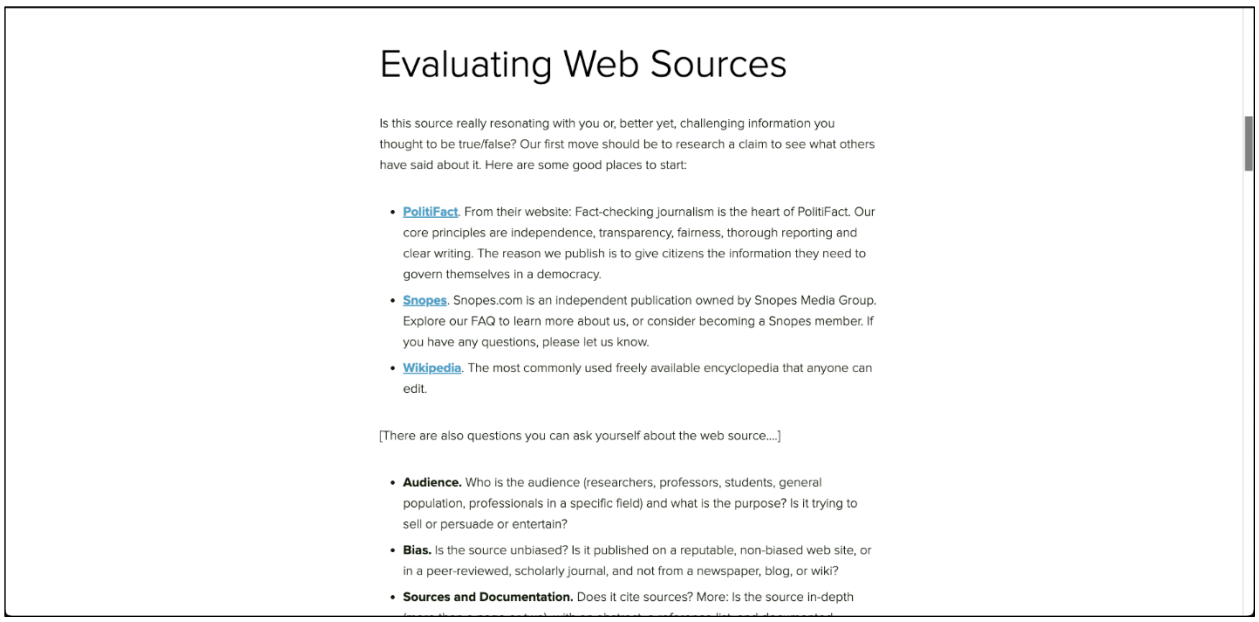

Figure 2
Screenshot of the "Evaluating Web Sources" section of the test Adobe Express page.

Researchers designed six tasks reflecting a range of real-world actions students might use research guides to accomplish. Tasks were identical for the two user groups, and all users completed all six tasks. Following best practices of usability testing design, the tasks were short, actionable, and avoided leading users with specific language or instructions within the prompts (McCloskey, 2014). (See Appendix B).

After completing tasks, participants completed a posttest questionnaire gathering their impressions of the platforms, administered through Qualtrics (see Appendix C). They were not asked to follow the think-aloud protocol during this portion of the session because they were providing written responses. Finally, after the posttest survey, the facilitator asked the user for general feedback and answered any questions.

Data Processing

Upon session completion, researchers used Panopto to transcribe the recordings and subsequently refined these transcripts, incorporating details of the on-screen actions. Next, researchers began to identify themes in participants' actions and comments, leading each researcher to establish an initial code tree. The researchers convened to reach consensus on the initial codes. With this agreement in place, a comprehensive code tree was created in NVivo, a qualitative data analysis software. The transcripts were then imported into NVivo and coded to identify patterns within the data.

Results

Pre and Posttest Surveys

The results of the pretest (Figure 3) confirmed that both test groups fit the target population of novice researchers. The Adobe Express group skewed slightly older than the LibGuides group, with an average of 2.5 versus 2 years at the university. Only one student recalled using a research guide for a class. The

majority reported themselves as somewhat confident in their online search skills (five out of six for the LibGuides group, and four out of six for the Adobe Express group).

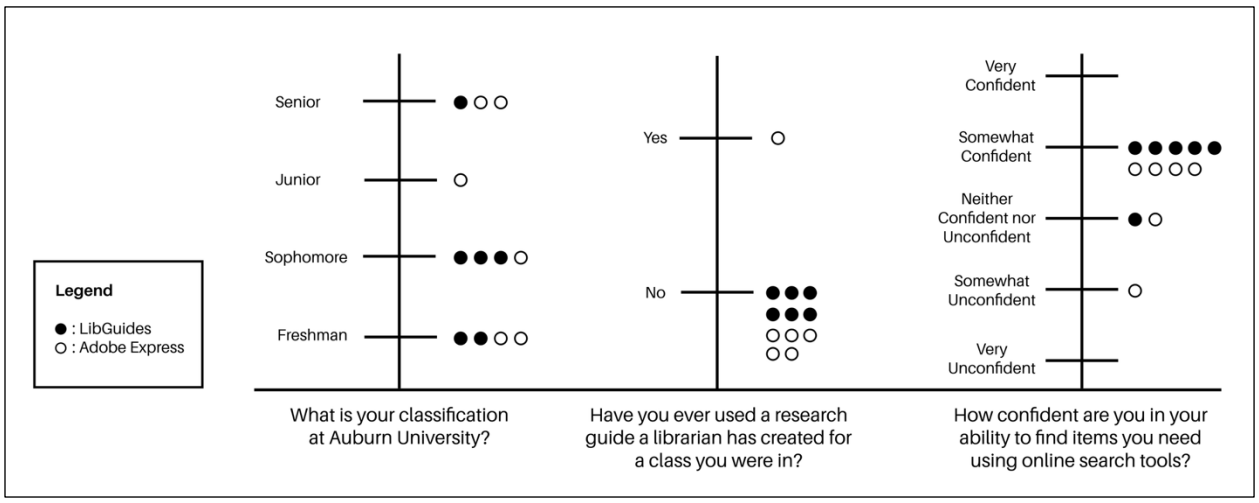

Figure 3
Pretest questionnaire results.

The posttest responses detailed in Figure 4 likewise showed only minor differences between the two populations' experiences. Both sets of responses were fairly positive about the guides' ease of use, with half of LibGuides users finding it easy and half neutral, while Adobe Express users ranged between very easy, easy, and neutral. The two groups averaged out at the same reported confidence in their future ability to use research guides to find library resources in a class, with more spread among the Adobe Express group. A similar pattern repeated with confidence in future ability to find helpful information using research guides. Finally, when asked about their confidence in using research guides to get help from the library, LibGuides participants skewed very slightly higher.

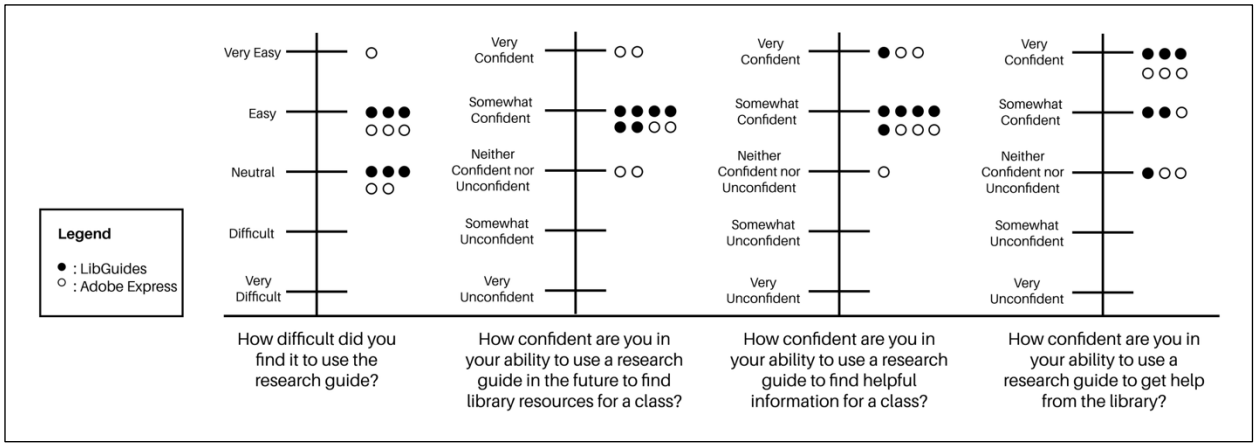

Figure 4
Posttest questionnaire results.

Overall, Adobe Express participants' responses were spread between answer choices more than LibGuides participants' (covering three response options in all questions), and ranged marginally higher in two questions, though lower in one. However, given the qualitative nature of this study, statistical significance should not be read into these data.

Task Success

Fewer participants than expected successfully completed all tasks. As Figure 5 indicates, Adobe Express users had overall higher success rates, at 23 out of 36 successful tasks versus 17 for LibGuides, with half of the Adobe Express participants completing 5 out of the 6 tasks correctly and through the intended pathways. Moreover, there was more variation in potential task outcomes than researchers expected (see Table 1). Only around two-thirds of total tasks resulted in a clear success or failure, with a third left as inconclusive or partially successful attempts. Some users approached tasks in unexpected ways, differing from those that the researchers assumed or that the guides most directly enabled. Many students thought they solved tasks, when in fact they had failed—for instance, finding a different format of source than the task required, without realizing the mistake, or searching for data within an article rather than locating a database as requested. LibGuides users experienced more of these instances of confusion, at eight task attempts. Overall, neither guide fully empowered participants to complete all tasks without barriers, but Adobe Express seemed to enable slightly greater success and less confusion.

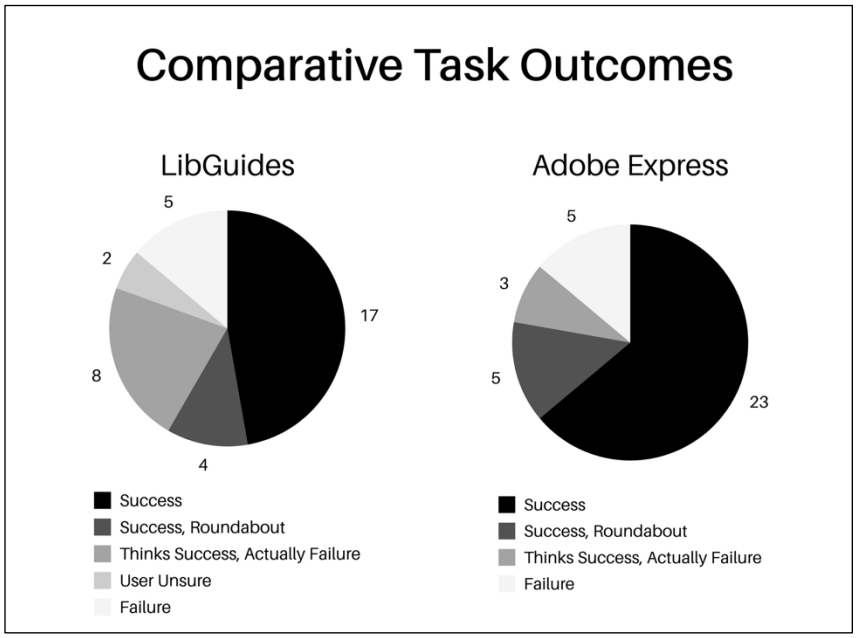

Figure 5
Comparative task outcomes.

Table 1
Task Completion Outcomes by Task[a]

Session	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6
LG1	Thinks Success	Success	Failure	Success	Failure	Thinks Success
LG2	Failure	User Unsure	User Unsure	Success	Thinks Success	Success
LG3	Roundabout	Success	Success	Roundabout	Success	Success
LG4	Thinks Success	Thinks Success	Roundabout	Success	Success	Thinks Success
LG5	Success	Success	Failure	Success	Thinks Success	Success
LG6	Thinks Success	Success	Roundabout	Success	Thinks Success	Success
AE1	Success	Failure	Success	Success	Success	Success
AE2	Success	Success	Success	Success	Success	Roundabout
AE3	Success	Failure	Success	Success	Success	Success
AE4	Failure	Failure	Success	Thinks Success	Failure	Roundabout
AE5	Success	Thinks Success	Success	Roundabout	Success	Success
AE6	Success	Thinks Success	Roundabout	Success	Roundabout	Success

[a]LibGuides test users are labeled as "LG" and Adobe Express test users as "AE"

Thematic Analysis

Interactions With Guides

Despite their different formats—multi-page for LibGuides and single-page for Adobe Express—there was significant overlap in students' interactions with the platforms. In both, students frequently scrolled past relevant content, especially in Adobe Express, given its longer-form layout. Scrolling appeared as a theme in all 12 sessions, either when participants viewed guide content or the resources linked from within the guide. In two out of the six Adobe Express sessions, *not* scrolling was also an issue, in that users did not scroll far enough down the page to view all content. However, though LibGuides' shorter layout resulted in different interaction styles, it had a parallel problem in that users gravitated toward the first two to three tabs of the guide.

The anchor links in the Adobe Express webpage (Figure 6) were intended to allow students to jump directly to relevant content, mitigating scrolling, but they proved confusing. Multiple participants right clicked to open the anchor links in new tabs, assuming they led to separate pages rather than further down the same page. One user suggested including a drop-down menu at the top, not realizing that was the intended function of the anchor links. Another suggested making them larger or more obvious. A participant also suggested placing the anchor links in a floating box appearing as the user scrolled down,

or having a back-to-top button; however, the current version of Adobe Express does not allow these features.

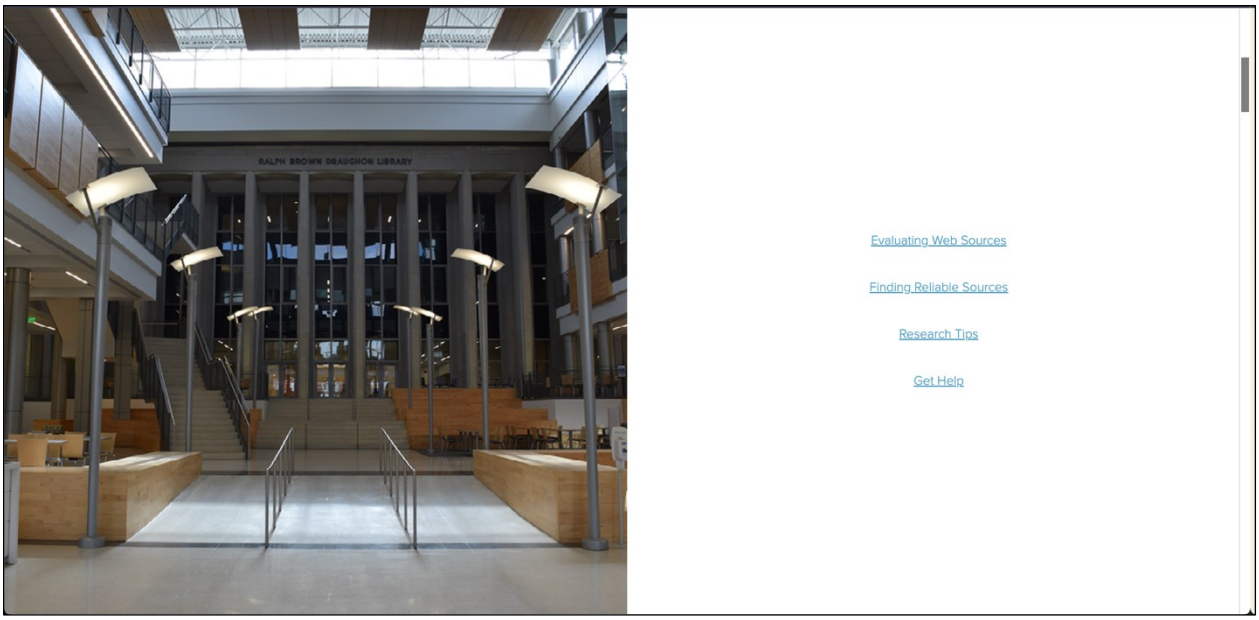

Figure 6
Anchor links (right) leading to content sections within the Adobe Express webpage.

Multiple Adobe Express users remarked positively on the platform's single-page design, stating that they liked not having to click through multiple tabs and sections. Users of the LibGuide likewise thought the guide was well laid out, but still, it took several longer than expected to click through all tabs in the sidebar, or to realize that was the primary intended way of navigating the guide. The higher number of options also seemed to create some initial hesitation. As one user commented afterwards: "Now I feel like it's more easy to work with than it was at first, because I see all these…buttons and I'm like, Okay, well, where do I start?"

The question of where to start was a key theme, particularly regarding the issue of embedded search boxes. All six LibGuides participants' first move was to locate a search box of some sort, whether the integrated search box to the upper right of the guide, the embedded library catalogue search widget, or in the case of one user, a database search from the broader library website. This search focus resulted in participants spending less time reading content on the guide before engaging in tasks. Additionally, when moving between tasks, students would seem to get stuck in a search mindset, going directly to the same search box they had just used rather than exploring other guide content. To some extent, Adobe Express users fell into this cycle less, but not by choice: Adobe Express webpages do not offer integrated search boxes. However, this lack of a search box frustrated some users, leaving them looking for a feature they expected to be present. And ultimately, they too fell into the search bar trap as soon as they found a database they liked, gravitating to searching resources they discovered in previous tasks.

The preference for searching over browsing is not surprising, nor are the issues the search boxes caused (Almeida & Tidal, 2017; Bergstrom-Lynch, 2019; Conerton & Goldenstein, 2017; Conrad & Stevens, 2019). Due to this search-first behaviour, users in both groups tended to skip over guide content. The lack of reading surfaced as a major theme, whether in the form of skimming text, not clicking through all

content, or not noticing pertinent links and resources. Students expected relevant resources to be immediately evident, with minimal time spent sifting through the guides.

The search box focus led to users across test groups navigating away from and back to the guides frequently. In all cases, guides fulfilled their intended role as launchpads for the research process. Students would find a resource on the guide, investigate, hit a dead end, return to the guide, and repeat the process. Interestingly, this happened at a higher rate with the Adobe Express guides, with students more frequently backtracking to the guide. There seemed to be a clearer delineation to students between the guide and the broader library website, and with this separation came a conception of the Adobe Express guides as a distinct resource to use.

Problems

Students rated both sets of guides mainly easy and neutral to use, with one rating Adobe Express as very easy. However, navigation issues arose in the LibGuides test sessions, particularly with the embedded functions, such as the library catalogue search that failed to load full-text resources during one session. Though the catalogue and electronic resources are not a part of the LibGuide itself, embedded functions and integrated widgets are one of the key features of LibGuides 2.0, and so comparing their use to that of Adobe Express pages, which lack the ability to create robust embedded content, highlights differences in the ways the two platforms direct students' information behaviour.

These problems impacted students' confidence during sessions, although posttest responses did not reflect the same hesitancy. While both groups mostly rated their confidence in their future ability to use guides in the somewhat confident to very confident range, six LibGuides participants and five Adobe Express participants experienced moments of hesitation where they were uncertain of their next steps, though more frequently within LibGuides sessions. Many students blamed themselves for issues instead of the system (four users of each platform) and apologized for mistakes, despite researchers reassuring them the systems were the focus. If research guides are intended to start users down the research path from an empowered position, the sessions revealed clear deficits.

Perceptions

Students commented positively on Adobe Express' visual design, noting that it was well put together. One participant suggested the color scheme could be more engaging, stating that the current version was "too minimalist," and a couple desired more visual breaks or differentiation between content areas. Most comments, however, were favorable. LibGuides did not receive comments specifically about its visual design.

Both guides received overwhelmingly positive feedback from students surrounding their role in collating relevant resources for ready access, both in session comments and in posttest responses. Students focused on the ease of using guides and their helpfulness as a starting point for research. Despite this, prior awareness of guides was low, with only one participant recalling using a guide before—though one participant from each group specifically mentioned they would have found a guide like the one demonstrated to be helpful.

Information Literacy Skills

As users attempted to complete the tasks, their information literacy skills and prior knowledge played a significant role in their success. Students preferred familiar resources like JSTOR, Academic Search Premier, and the state's virtual library. Interestingly, the reliance on prior knowledge in resource selection was more pronounced within the Adobe Express group, possibly due to the users' slightly older demographic. In each group, four out of the six participants used or mentioned normally using Google or Google Scholar during their research processes, for functions such as clarifying wording from tasks, accessing Easy Bib, navigating to campus websites, and searching book descriptions. Clearly, librarians should not expect students to use research guides in isolation from their past experiences or the broader Internet, regardless of guide layout or platform choice.

Additionally, neither guide fully enabled students to overcome gaps in information literacy skills. In neither group did students typically scroll through all search results, instead usually focusing on only the first two to five results. Additionally, mission drift was common, as students would start with one source type in mind but often choose sources that did not fit task requirements, like selecting a report instead of a book. Confusion around research terminology and source types, such as "journal," "book," "catalogue," "database," and "references," was a challenge for nearly all users. Guide design alone proved insufficient to direct students fully through the research process when not accompanied by previous instruction and skill development.

Discussion

Task Success

In a direct comparison, participants in the Adobe Express group had more success in completing assigned tasks, either outright or in a roundabout manner. However, the present usability study is qualitative, not quantitative. Furthermore, qualitative usability studies may result in more nuanced answers to the question of whether a task was completed successfully or not. Some students managed to complete tasks by circumventing the guides' provided pathways, which is a technical success, but still a problem from a design perspective if it is taking users far too many clicks to reach a goal, beyond the point they would be likely to continue if outside the test environment. Simply reporting success or failure rate would obfuscate meaningful data. Given these factors, the researchers report the task success rate primarily as a point of interest, but caution against placing too much emphasis on this numeric comparison.

Implications for Guide Design

The study identified features that significantly affected students' search processes. The presence or absence of a search bar steered students toward particular pathways of interaction. On the Adobe Express webpage, which lacked a built-in search integration, students had to first scroll through guide content to identify appropriate databases or other linked resources. On the LibGuide, three out of the six users' first step in the sessions was to go straight to built-in search to the upper right of the guide, and two additional users got as far as the second guide tab before homing in on the embedded catalogue search. Finding a search bar halted the process of browsing guide content.

Researchers have suggested that including a search box in a LibGuide may cause users to become overly dependent on a Google-like search approach (Conerton & Goldenstein, 2017; Thorngate & Hoden, 2017).

The presence of a search box on the test LibGuide contrasted with the absence of one in the Adobe Express guide, confirmed those findings and highlighted users' search-focused mental models. Whether this is a point in favor or against the inclusion of a search bar on the guide is a complicated question. On the one hand, confusion about what the search bar is searching and this lack of engagement with guide content is an issue, which other researchers have also identified (Almeida & Tidal, 2017; Conrad & Stevens, 2019). But on the other hand, students very much desire a search bar, aligning with research about Generation Z (Blocksidge & Primeau, 2023). Previous researchers have consistently found students value functional search bars (Barker & Hoffman, 2021; Hintz et al., 2010; Ray, 2025), and this finding is supported by the fact that 1) the LibGuides users naturally gravitated to search, and 2) multiple Adobe Express users expected the guide to have a search bar and were confused when it did not. Should research guides funnel students down a search behaviour path librarians think is best, or should they meet students' natural interaction styles where they are?

The design differences between Adobe Express (single-page) and LibGuides (multi-page) also revealed mixed findings. Adobe Express users, faced with a single-page layout, tended to scroll excessively, missing resources, which the anchor links did not fully remedy. Adobe Express' fixed single-page design limits possibilities of improvement. Similarly, LibGuides users hesitated to navigate multiple tabs, leading to missed content. While Adobe Express' single-page, simpler layout reduces confusion, it raises the question of how much content to display upfront without overwhelming users. Overloading a page with text goes against best practices (Bergstrom-Lynch, 2019; Little, 2010; Pickens, 2017). However, even when faced with multiple tabs with shorter pages, users simply will not engage with all guide content.

Implications for Instruction

Consistency in the design and navigational settings of any learning object demonstrates an understanding of user behaviour and anticipating their skill sets and needs (Burchfield & Possinger, 2023). Unfamiliar information can increase cognitive effort for working memory, creating confusion (Burchfield & Possinger, 2023; Pickens, 2017). This has implications for librarians trying to create pedagogically effective guides.

Additionally, guide creators must consider the promotion of their guides. Among the 12 participants in the study, only one student could identify their subject librarian or recall being introduced to a similar guide during class. Despite their limited awareness of these resources, students found them helpful and recognized that they would have benefited from such tools when starting their research, aligning with the findings of Stone et al. (2018) and Chan et al. (2019). It is worth noting that course guides are not created for every course taught by AUL subject librarians, despite active participation in numerous instruction sessions within their disciplines. AUL does provide a general subject LibGuide embedded in all LMS courses, and instruction librarians have the option to include course-specific LibGuides within these LMS courses. However, it remains unclear how many librarians actually do this and whether they actively teach students about these guides during their instruction sessions. Additionally, there is uncertainty surrounding students' awareness of the general LibGuide that is incorporated into all university LMS courses. Consequently, it was not surprising to find that students were largely unaware of research guides.

This situation raises a critical consideration for instruction librarians: is a course guide necessary? If so, what objectives should it aim to achieve, and how are librarians introducing it to their students? To meet users' information needs, librarians must grasp their users' mental models and design research guides with consideration for their cognitive loads, informing their design, promotion, and assessment. Important questions to address include: What does a user require to complete this assignment? Are there terms they will understand without needing to look them up? Is the information presented in a clean, not overly text-heavy format? Is there a search box that directs them to the sources they need, and will they comprehend how to utilize those sources?

Conclusion

In this usability study, we compared students' use and perceptions of two research guides created in LibGuides and Adobe Express, with typical layouts for class guides at the researchers' home institution used in each, highlighting key design challenges. While both guides include features that promote student discovery of library resources, the multi-page LibGuides' complex organization and Adobe Express' scroll-heavy single-page layout each posed their own problems. Ultimately, however, students' user behaviours overlapped heavily, indicating librarians need to pay close attention to users' mental models when designing guides and selecting layouts and platforms.

Limitations and Further Research

As a small-scale, exploratory study with a qualitative design, it is not the purpose of the present project to declare a universal best choice between these two options. We opted to compare the two platforms based on the layout choices currently in use at their institution. To fully isolate the variable of single-page versus multi-page layouts, the researchers acknowledge that further research is needed, comparing single-page LibGuides to multi-page LibGuides, or single-page LibGuides to single-page Adobe Express pages.

In addition to this limitation, this study focused on undergraduate college students, excluding graduate student users who would exhibit different experiences, skills, and expectations. Researchers also did not seek out students with any particular accessibility needs to test those functions of the guides, or employ an accessibility rubric in design, which has been a major trend in recent research (Campbell & Kester, 2023; Chee & Weaver, 2021; Greene, 2020; Hopper, 2021; Kehoe & Bierlein, 2024; Pionke & Manson, 2018; Skaggs, 2016; Stitz & Blundell, 2018). In a couple of sessions, technical issues occurred with the catalogue, electronic resource log-in, or links in the guides—issues which may well occur in real-life use, but which also introduce noise into the data.

Usability tests are designed to be iterative, with the current results representing one round of testing. Ideally, as results are implemented in design, further tests are conducted. The results were also qualitative, representing general platform issues and not statistical data about user interactions such as clicks, time to task completion, and posttest perceptions. For statistical validity, the study design would need to be adjusted to include more users and to reduce variables introduced through the think-aloud protocol.

Finally, only one of the test users recalled using a LibGuide or similar tool previously. No instruction was provided on how to use the guide, and this was students' first time viewing the content. Yet, because LibGuides are often created as course guides, it is likely that some users in the real environment would have had some prior exposure to the platform. It is possible that test sessions run after a brief

demonstration, or targeting students from classes with integrated LibGuides, would produce different user interactions.

Implementation

Specifically, within the context of their own home institution, the researchers will recommend the following questions be used to inform guide creation:

- *Will the guide embed in the LMS?* If so, LibGuides' learning tools interoperability abilities may make it a better choice for integration.
- *Will it be introduced to students in class and relevant contexts?* If not, reconsider whether a guide is necessary.
- *Should there be an embedded search box in the guide?* This study supports previous research indicating this should likely be excluded.
- *How much content and how many student learning outcomes should be included?* Prioritize the essentials, since users of neither platform or layout will likely engage with all content.
- *Is the course instructor using Adobe Express for other course content?* If so, mirroring the guide's platform may encourage use.

Additionally, the researchers recommend conducting an assessment of all research guides housed at AUL every 2-3 years. Where librarians are empowered to do so, developing and enforcing internal guidelines that reflect and support students' mental models is also recommended. Moreover, given the labor and the issues students encounter within guides, regardless of layout or platform, librarians should carefully consider whether guides will be effective tools for student learning.

Applying the findings from this study to AUL's research guides will be a long-term and multi-step process, requiring the buy-in of multiple stakeholders, which can be difficult to obtain (Gardner et al., 2021). However, assessments like usability studies must be the starting point for practice. Assessment practices should be ingrained as daily habits within all library services, and this includes the assessment and review of research guides. As libraries continue to adapt to meet the diverse needs of users, it is essential to modify practices to align with varying learning styles and user behaviours, and to adjust pedagogical approaches accordingly.

Author Contributions

Abigail E. Higgins: Conceptualization, Data curation, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing **Piper L. Cumbo:** Conceptualization, Data curation, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing

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Appendix A
Pretest Questionnaire

Please type your name.

_____

Are you 18 years or older?
- o Yes
- o No

Have you ever used a research guide a librarian has created for a class you were in?
- o Yes
- o No

How confident are you in your ability to find items you need using online search tools?
- o Not at all confident
- o Somewhat unconfident
- o Neither confident nor unconfident
- o Somewhat confident
- o Very confident

What is your classification at Auburn University?
- o Freshman
- o Sophomore
- o Junior
- o Senior
- o Graduate student

What is your major or degree program?

_____

Appendix B
Usability Test Tasks

LibGuide: aub.ie/usability_test_guide
Adobe Express page: aub.ie/usability_test_page

Task 1
Find a database that contains reliable sources on the topic of college entrance exams no longer being required for admission, using this guide: [insert relevant guide link from above here]

Task 2
Using the same research guide, find a book on the topic of college prep and ACT scores.

Task 3
Find a database that contains reliable statistics about water quality.

Task 4
You need advice on how to manage your research process. Find some information to help.

Task 5
Find a resource that can help you create references when you are writing a paper.

Task 6
You want to talk to someone about finding resource for an upcoming assignment. Set up an in-person appointment with a person who can help.

Appendix C
Posttest Questionnaire

Please enter your name

_____

How difficult did you find it to use the research guide?
- o Very difficult
- o Difficult
- o Neutral
- o Easy
- o Very easy

How confident are you in your ability to use a research guide in the future to find library resources for a class?
- o Not at all confident
- o Somewhat unconfident
- o Neither confident nor unconfident
- o Somewhat confident
- o Very confident

How confident are you in your ability to use a resource guide to find helpful information for a class?
- o Not at all confident
- o Somewhat unconfident
- o Neither confident nor unconfident
- o Somewhat confident
- o Very confident

How confident are you in your ability to use a research guide to get help from the library?
- o Not at all confident
- o Somewhat unconfident
- o Neither confident nor unconfident
- o Somewhat confident
- o Very confident

Now that you have used a library research guide, how would you describe what it does?

_____