Make Me Think! Exploring Library User Experience through the Lens of (Critical) Information Literacy

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ABSTRACT

While (critical) information literacy (IL) acknowledges the political, economic, and social forces that shape complex information environments, library user experience (UX) typically centers efficiency and "seamlessness," ignoring the power structures and values that condition learning. In this article, we explore the tensions between IL and UX values and practices, with the aim of starting a conversation about how these two related fields can become more closely aligned.

I n their shared goal to make academic libraries into sites that support student learning, user experience (UX) and (critical) information literacy (IL) practices seek to understand and improve the ways that communities interact with libraries and library workers. At first glance, the relationship between the two appears largely symbiotic; for example, better UX could free up IL librarians to move beyond "point-and-click" instruction to address issues related to the production and use of information. In our view, however, this relationship, and the practical ways in which these related fields of study are employed within libraries, is more complex than it might seem. A potential point of tension, for example, could be related to the purpose of each approach; while teaching and learning—and, thus, IL—are often specifically designed to recognize the unpredictability and seeming inefficiency of complex, educational processes, library UX is frequently positioned within the LIS literature and everyday library work as centered on efficiency and seamlessness, among other attributes. These differences, which might be linked to the relative maturity of each field, hint at the need to explore the relationship between library UX and IL in more detail.

However, these differences become more problematic when they are considered in light of the shift toward critical approaches to librarianship. Critical understandings of IL foreground a critical engagement with the complex economies of knowledge construction (Luke and Kapitzke 1999). Informed by both critical pedagogy and critical theory, critical IL (CIL) has emerged as a challenge to the legacy of standards and guidelines that position IL as a set of generic, skill-based information activities. Centering community activity as well as the

enactment of social and political action, CIL also focuses attention on the embodied and affective shape of learning within dynamic information environments (Drabinski and Tewell 2019). In this way, CIL practitioners are increasingly starting to acknowledge that the classroom is a site of power enmeshed in overlapping and sometimes contradictory political, economic, and social formations.

In contrast, library UX—as it is represented in the literature, at least—has yet to fully engage with the critical turn; it typically remains focused on the end goal of helping students to get things done efficiently and "seamlessly" rather than interrogating the structures that bring tensions to complex information environments. Derived from the broader concept of UX, which is defined as a "user's perceptions and responses that result from the use and/or anticipated use of a system, product or service," library UX brings a focus on nonutilitarian measures of engagement to user-centered library research, including satisfaction and enjoyment (ISO 2018). At the same time, the recognition that "only an individual can have feelings and experiences" means that these experiences continue to be understood as individual rather than social phenomena (Law et al. 2009). Similarly, a failure to interrogate the commercially focused antecedents of UX, including the ways in which users and infrastructure are positioned within these narratives (Amirebrahimi 2015, 2016; Ankerson 2018), means that library UX seems to remain isolated from broader questions related to practice, embodiment, and power.

What started as differences between library UX and IL can consequently be understood as giving rise to major divergences in approaches as well as broader values and goals. In time, these distinctions could also lead to an undermining of user-centered library work, in which library UX and IL (advertently or inadvertently) start to frustrate or work against each other. Accordingly, our purpose in writing this article is to surface these points of tension, with the goal of identifying opportunities for conversation and collaboration between the fields. We will achieve this aim through reviewing literature from the fields of IL and library UX and by drawing on our personal experiences as academic librarians involved in both CIL and library UX initiatives.

In critically interrogating the relationship between library UX and CIL, we acknowledge that library UX has made a number of important contributions to library research; the employment of qualitative or participatory research methods means that library UX often gives learners a voice that is all too often missing from research and planning. We further recognize that the field of library UX is relatively new and that many library practitioners are still learning how to implement UX within their own institutions. CIL is also far from being beyond reproach, as previous research indicates (Seale 2010, 2016; Nicholson 2016, 2019; Hicks 2018). The lack of attention that has been paid to the learner's voice, for example, is a problematic shortcoming within IL research, which has tended to prioritize librarians' and scholars' information activities in its research methods and in the creation of IL models (e.g., Bruce 1997; Coonan and Secker 2011; ACRL 2016). We also note the difference between teaching for IL and teaching for system

use (Dagan 2018). However, given the importance that IL and library UX play in structuring patron information interactions and the role that UX methods play in shaping the tools and spaces that feature within IL instruction, we consider it vital that these two fields should engage in critical conversations about respective purposes, aims, and principles. This analysis is also particularly important given the increasingly critical focus of librarianship. Although a handful of practitioners have started to promote a critical analysis of library UX (Andrews 2016; Lanclos and Asher 2016; Larose and Barron 2017; Lanclos 2020), it is clear that a failure to ask critical questions necessarily forecloses the user-centered problems we address, the tools and strategies we use, and the "solutions" we propose.

Literature Review

Library UX

Library UX has its roots in community needs analyses that were carried out in the nineteenth century (Dent Goodman 2011) and in large-scale ethnographies from the early 2000s (e.g., Foster and Gibbons 2007; Delcore, Mullooly, and Scroggins 2009; Smale and Regalado 2011; Duke and Asher 2012). These studies, which notably emphasize the broader context of student research practices rather than just the library's role in the process, offered direction at a time when libraries were grappling with their role within increasingly self-service campus cultures (Foster and Gibbons 2007). Most recently, however, the "messiness" of qualitative data (Lanclos 2016), as well as competing influences, such as design (Bell and Shank's book, *Academic Librarianship by Design: A Blended Librarian's Guide to the Tools and Techniques*, was published in 2007) means that ethnographic user research has slowly become supplanted by concepts of library UX. Incorporating principles of usability and design into ethnographic methodologies, library UX aims to understand and improve a user's experience of a library. This approach foregrounds emotional responses to a product, including satisfaction and enjoyment. In further centering testing and a user's immediate needs rather than the observation of shared social practices, library UX also brings a more process-driven and pragmatic focus to user-centered library research (Schmidt and Etches 2014; Lanclos and Asher 2016; Lanclos 2020).

In contrast to the early focus on large-scale ethnographic examinations of undergraduate research practices, library UX has typically been employed within more short-term projects. While predominantly emphasizing the ways in which users engage with library spaces or web resources, research has also studied topics as varied as electronic resources management, new employee onboarding, and collection development (e.g., Boisvenue-Fox et al. 2018; McKelvey and Frank 2018; Pennington et al. 2016). Growing interest in metrics means that library UX research has also started to be used within quality assurance processes to measure library value (Burn et al. 2016; Appleton 2018). As a relatively new field of study, library UX research has been bolstered by the establishment of the *Weave Journal of Library User Experience* in 2014 and the annual UXLibs conference in 2015. At the same time, critical engagement with

the precepts and practices of user-centered library research has been limited. Although Donna Lanclos and Andrew Asher (2016) have critiqued library UX as "stuck in a relatively unfinished ethnographic moment" rather than centering on a detailed understanding of users, it is only recently that practitioners have started to call for a critical turn within UX (Preater 2019). Similarly, although a handful of authors have started to address the risk of designing services for majority groups and treating nonmajority and marginalized groups as afterthoughts (Andrews 2016), critiques of library UX still remain somewhat isolated (Andrews 2016; Lanclos and Asher 2016; Larose and Barron 2017; Lanclos 2020; Seale, Hicks, and Nicholson 2022). This lack of critical engagement provides an important impetus for this article.

Critical Information Literacy

CIL emerged at a similar time as the first ethnographic studies of library users. Traced back to an early study by Cees Hamelink (1976), who argued for the need to critically analyze oppressive and institutional media structures, CIL became popularized through librarian work within the writing and rhetoric classroom (Swanson 2004; Elmborg 2006). Drawing on research that interrogated the complex and socially situated shape of literacy and the work of Brazilian educator Paulo Freire, these early studies advocated for more inquiry-driven and learner-centered approaches to IL instruction. They also paved the way for research that explored the shape of CIL within other disciplinary and educational contexts, including the behavioral sciences, modern languages, and English literature, as well as secondary education and public libraries (Tewell 2015). Like library UX, CIL has been supported through dedicated conferences (e.g., the Critical Librarianship and Pedagogy Symposium) and sympathetic publishing venues, such as Library Juice Press. However, despite the prolific first decade of CIL, research has rarely explored contexts outside of the IL classroom, with Alison Hicks and Caroline Sinkinson's (2016) examination of assumptions that are embedded with retention narratives providing one of the few exceptions. Similarly, only a handful of studies have explored instructional design and online IL education through a critical lens (Sundin 2008; Hicks 2015).

Most recently, the ongoing maturation (and institutionalization) of the field has led to research that has explored IL instruction through a variety of critical lenses, including neoliberalism and critical race theory, among other theoretical perspectives (Seale 2016, 2020). Drawing attention to the influence of market models within higher education, the employment of neoliberalism as a framing structure warns of the impact that technocratic ideologies have on educational initiatives, including the promotion of "short-term results, the demands of the market, just-in-time services, return-on-investment (ROI), and efficiency" (Mirza and Seale 2017, 185). A neoliberal frame also emphasizes the value of exploring IL through the lens of time and speed (Nicholson 2016, 2019). Noting how temporal logics bring a "just-in-time" focus to library management, an examination of time and speed illustrates how the "accelerated, fragmented time of the corporate university" promotes an engagement with information that is

both superficial and simplistic and at odds with teaching and learning goals (Nicholson 2016, 30). The recognition that slow approaches to scholarship may form a way through which dominant temporal narratives of efficiency and productivity can be challenged provides a further indication of the complex ways in which time shapes the enactment of IL practices (Nicholson 2016). The need to extend these critiques to the design of the tools and material structures against which IL is referenced provides a motivation for this work.

IL and Library UX

Somewhat surprisingly, given the user-centered focus of both library UX and IL, there has been little examination to date of the somewhat tangled relationship between these concepts. Where UX and IL have been connected, librarians have tended to correlate "poor" levels of IL skills with poor UX (Foster and Gibbons 2007, 72; Delcore et al. 2009, 46; Pennington et al. 2016, 50) or assume that the need for library instruction would be diminished if a library worked as it was intended (Bell 2014). Other librarians have more overtly focused on reducing cognitive load though simplification and the removal of choice, noting that a website's primary role is to help users get their work done (Pennington et al. 2016, 50) and "a good UX must be easy before it can be interesting" (Schmidt and Etches 2014, 4). In what remains one of the few extended discussions about the connections and potential overlaps between UX and IL, Catherine Baird and Tiffany Soares (2018) conclude that usability data can provide evidence for the design of teaching and learning interactions. More commonly, however, continued confusion about the scope and definition of UX, as well as the lack of a clear delimitation between the related fields of IL and information seeking, needs, and behavior, has restricted mutual understanding and engagement. Moreover, little attention has been paid to work that explores everyday spaces through the lens of IL, despite the insights it might afford to UX practitioners (Lloyd and Wilkinson 2016). These oversights formed a final stimulus for this analysis.

Connections and Tensions between UX and IL

We will now turn to explore the connections between UX and IL in more detail. Drawing on the literature from each field and from our own observations and experiences as academic librarians involved in both library UX and IL initiatives, we focus our examination on the broad themes of context, social dynamics, the body, and time.

Situated Information Practices

A focus on context or the situatedness of user information practices forms one of the most noticeable ways in which library UX differs from understandings of IL. The role that context plays in shaping information activities represents one of the longest debates within the field of IL. Many of the earliest guides and models of practice positioned IL as a set of universal

and generic skills. Gradually, however, as research has continued to demonstrate how information activities vary between settings, IL has become acknowledged as referenced against "the co-constructions that constitute a particular practice or performance of a practice" (Lloyd 2014, 87) rather than being self-contained. In contrast, library UX often remains isolated from the broader considerations of a setting, with literature positioning the environment of use as "a distraction" that needs to be "controlled" (Norlin and Winters 2002, 3). We recognize that the decision to carry out laboratory-based or decontextualized studies represents a trade-off and that UX practitioners will often combine different research methods to attempt to build a more complex picture of context. However, a reliance on isolated and generic models of information engagement sits uneasily with IL research and practice that recognizes the important role that context plays in shaping information use. Along the same lines, library UX studies that attempt to distill and draw meaning across entire campus communities (e.g., Paterson and Low 2011; Clark et al. 2016) contrast and conflict with the increasing focus within IL research on the nuanced ways in which information and information systems are valued by different social groups. We acknowledge that the decision to do usability testing along the lines of disciplinary structures or user group categories (e.g., "undergraduate" or "graduate" student) may form a pragmatic decision to facilitate data collection and analysis. Yet, it is clear that this approach, which has been critiqued as forming a generationalist approach centered on the convenient reification of "discreet and 'unique' demographics with World Historic Importance" (Buschman 2012, 104; also see Lanclos 2020), also puts library UX at odds with the increasingly nuanced and intersectional approaches to IL research (e.g., Ilett 2019; Reyes, Hicks, and Maxson 2018).

An emphasis on decontextualized or universal models of practice further risks obscuring the varied ways in which learners construct understanding within unfamiliar information environments. Sociocultural theories of learning emphasize that people learn through building on prior knowledge; as Jessie Loyer (2018) points out, "physical, emotional, and spiritual components of self" (145) play vital roles within the IL classroom. However, as UX practitioners Penny Andrews (2016), and Karine Larose and Simon Barron (2017) acknowledge through their examination of the ways in which the needs and experiences of nonmajority groups are neglected within service design, learners' approaches to building understanding are often overlooked within library UX testing; mental models of search, for example, are seen as "unhelpful" when using the library catalog (Wilkinson 2009, 53). We accept that library UX faces the challenge of designing tools for a wide range of users. Notwithstanding, the drive to distill and extract a common experience risks creating a gradual homogenization of what it means to act within a complex world (Amirebrahimi 2016, 87) while further raising questions about who has the power to enforce normativity. These issues also hint at broader problems with the feasibility of evidence-based models within educational practice. As Phil Newton (2011) points out, "what does it mean to say that something has 'worked', and for whom has it 'worked' and in what context?"

Social Dynamics

A second, related area of divergence between library UX and IL is the emphasis that is placed on social dynamics. As a social practice, IL is shaped by the affordances of a setting or the opportunities that a community offers learners to engage with information (Billett 2001). Illustrating that context affects what and how people learn, as well as the types of information to which people have access within a specific setting, a focus on social dynamics acknowledges that IL is both constrained and enabled by structural issues. These ideas have led a handful of authors to examine how a failure to acknowledge these restrictions can create deficit thinking within IL instruction (Tewell 2020; Heinbach et al. 2019). They have also led to calls for teaching to focus on the messiness of everyday information interactions rather than aspirational future achievement (Hicks 2020). Notwithstanding, social dynamics often remain unacknowledged within library UX; as UX practitioner and scholar Shaheen Amirebrahimi (2016, 92) points out, the consolidation of a single UX means that "you also don't have to think as explicitly about power . . . the lines of its transmission kind of get erased." Likewise, a failure to engage with sociocultural tensions that may affect a person's access to and engagement with information sits awkwardly with IL because it risks positioning information environments as value-free and neutral rather than as sites of struggle among authority, power, and resistance. It also risks obscuring other sites of power, including the positioning of UX practitioners as the only people who can reveal and remedy the user's pain points (Seale et al. 2022). These tensions, which may emerge from an uncritical acceptance of prevailing, commercially focused, UX literature, indicate an important area for future collaboration between library UX and IL.

The focus within IL on social dynamics means that library UX work that fails to interrogate Google models of searching forms a further point of tension. Over the past decade, academic libraries have widely tested search boxes that aim to provide a single interface for searching and accessing library content (Deodato 2015). These changes are often justified by the uneasy and often envious and admiring relationship that libraries have with commercial search providers; Joshua Barton and Lucas Mak (2012, 85) argue, for example, that "commercial search tools, especially Google, define the contemporary paradigm of the online search experience, at least for university students." Kate B. Moore and Courtney Greene (2012, 145), similarly argue that "providing 'one-stop shopping' access to widely sourced library content" through platforms that mimic Google or Facebook, "is increasingly important in ensuring our institutions' long-term viability." These ideas may be widespread, but they simultaneously erase how search behavior is produced and reproduced through interaction with search interfaces; if students are accustomed to this sort of searching, it is because it is predominantly what they have been exposed to rather than because it is the only way to think about search. Google's ubiquity and power have acted to normalize the single search box, which prioritizes efficiency, convenience, and utilitarianism as "the very definition of search itself" (Hillis, Petit, and Jarrett 2013, 51).

From an IL perspective, these ideas are problematic because they erase a broader interrogation of search models; a reliance on keyword searching, for example, is always limited by what users already know (Hillis et al. 2013, 159). Along the same lines, Megan Dempsey and Alyssa M. Valenti's (2016) observation that "students generally either select poor keywords to articulate their information needs, or when they do select appropriate keywords, lack an understanding of how best to combine search terms to refine results" (205) is likely due to a lack of contextual knowledge rather than an argument for the further simplification of search. These ideas, which demonstrate how user search behavior must be understood as continually emerging rather than as something natural and innate, provide a further indication of the conflict between a library's UX and instructional goals (Gourlay, Lanclos, and Oliver 2015).

Embodied Learning

Corporeality, or the role of the body, forms a third key area of contrast between IL and library UX. Bodies have not traditionally been recognized as central to library and information science; a typical emphasis on cognitive ability, as well as textual or digital sources of information, means that corporeal experience has long been "uncoupled" from an understanding of information activities (Lloyd 2014, 86). Most recently, however, IL research has started to explore how the body constitutes a rich site of embodied and situated knowledge (Lloyd 2010). These ideas, which position corporeality as both "a source of reflexive information" and a "site of meaning for others," illustrate that IL must be understood as embodied or as a "lived experience" that shapes and is shaped by experiential narratives (Lloyd 2014, 93). In contrast, library UX has an entangled and somewhat contradictory relationship with the body. UX has traditionally been differentiated from human-computer interaction by its focus on affective dimensions of practice (Seale et al. 2022). However, the emphasis within library UX on the "user" could also be understood as producing unhelpful user/nonuser binary relationships that, paradoxically, have long been seen as risking the perpetuation of a systems-centered approach within LIS research (Julien 1999). From an IL perspective, a focus on user/nonuser represents a point of tension because it reproduces dualist notions of development and progress (Nicholson 2019; Seale 2016). The emphasis on monologic, generic individuals further distances library UX from the emphasis that IL places on awareness of one's own body and the bodies of others and "the ways in which people interact with things, and with each other" (Cohen 2005, 15).

At the same time, the emphasis on creating seamless, frictionless and pain-free experiences means that library UX can also be understood as both erasing and exploiting bodies by negating lived experiences, or the tangible and embodied ways in which humans exist in the world. The reliance within library UX on personas, for example, which are "conceptual stand-ins" for potential users (Massanari 2010, 401) runs the risk of sidelining bodies from practice by oversimplifying and generalizing, particularly if characters are based on existing assumptions and biases rather than being developed from ethnographic research (Turner and Turner 2011). The use of

personas also threatens to reinforce whiteness, ageism, and ableism by treating "disabled users, part-time students, older users, non-native English speakers and so on as add-ons" (Andrews 2016, 114) or somehow lesser than other groups, as UX researchers have pointed out. These ideas reinforce deficit thinking, as IL research that has unpacked stereotypes of international and transfer students, among others, has demonstrated (Hicks 2016; Heinbach et al. 2019). At the same time, and somewhat paradoxically, library UX can also be understood as erasing bodies through their exploitation; we observe learners, "get . . . them to 'think aloud,' to verbalize, to card sort, to do" (Seale et al. 2022). From an IL perspective, these ideas create issues because they often connect understanding to the production of artifacts rather than unobservable or reflexive activity. This issue is not limited to library UX; similar critiques are made about outcomes-based educational models. We also recognize that these issues may, again, be linked to pragmatic methodological choices. However, given that the distilling and flattening of human experience also specifically runs counter to feminist and critical pedagogies and to the "people in practice" approach that characterizes social and situated approaches to IL (Lloyd 2010), it is clear that further interrogation of the ways in which bodies are treated within popular research methods forms a complex point of tension.

Time and Speed

The treatment of time and speed constitutes a final area of difference between library UX and IL. Time functions as "an invisible and unremarked" site of power (Sharma 2014, 13). This is particularly the case within UX, where an emphasis on accountability, return on investment, and value in the corporate sector center fast-paced innovation and prediction. These timespans have remained relatively unchallenged within instances of library UX, which often makes similar connections between the survival of the library and UX: "the future state of academic libraries . . . is connected to better understanding the user and their needs" (Lundberg 2017, 11). At the same time, the privileging of the "moment of use" means that library UX simultaneously fixes users within an eternal and context-free present. These temporal configurations pose a number of issues for IL. An uncritical focus on future time, for example, has the potential to strip both library UX and IL of transformative possibilities: user research is reduced to the routine, ongoing production of "insights" for "business acumen" (Amirebrahimi 2016, 13), whereas IL devolves into training for future knowledge workers or entrepreneurs. An unflinching emphasis on present time further runs counter to the emphasis that constructivist thought places on prior knowledge and experiences while obscuring the important role that learner goals and motivations for the future play in shaping IL practices (Hicks 2020).

The emphasis that library UX places on speed raises a number of equally problematic potential issues for IL instruction. The need for efficiency, for example, is frequently cited as an important rationale for library UX testing; practitioners are encouraged to design systems that speed up workflows or reduce the amount of time or effort that a user has to expend

interacting with library and information systems (e.g., Priestner and Borg 2017, 79). The use of "guerilla-style" rapid prototyping (Young 2014) testing methods, which may form a further trade-off that underresourced library UX practitioners have to make, provides additional evidence of the influence that accelerated time plays within library UX. Notwithstanding, the emphasis within library UX on fast-paced productivity constitutes a point of tension because it conflicts with the reflexive, critical, and, ultimately, transformative goals of IL education. As Karen P. Nicholson (2016) has acknowledged, an emphasis on acceleration results in superficial, condensed approaches to IL instruction, including one-shots, guides, and 2-minute videos—pedagogical approaches that foreclose the implementation of present-tense and localized teaching practices, as well as creativity and action. More specifically, the correlation of speed and efficiency with a product's "learnability" (Comeaux 2012, 198) can be seen as undermining the constructivist-inspired turn to reflective practice within library instruction. A constant striving toward the future further draws attention away from the emergent and contingent shape of information activities to reposition IL as a fixed and measurable concept that is centered on timeless and ahistorical claims of truth (Drabinski 2014).

Discussion

Our review of IL and library UX literature has revealed a number of points of tension related to the ways in which each field understands the roles that context, social dynamics, the body, and time play within information interactions. These differences have emerged through the contrasting disciplinary traditions and values that have shaped each practice and may often be linked to the need to make pragmatic decisions in the face of underresourcing and limited scope for methodological development. However, we contend that if these divergences are left unexamined, they could lead to a number of issues related to the ways in which libraries support the goals of higher education, including the underscoring of problematic and limiting pedagogies.

One of the most visible potential impacts that could arise from these points of tension is the risk of renewed engagement with problematic behaviorist pedagogies, which position learning as taking place through stimulus-response conditioning. Educational technologist Audrey Watters (2017) has long warned of what she labels "new behaviorism": educational tools that promise impressive-sounding learning gains while drawing on outdated and problematic notions of human development—an accusation that has also been leveled at the learning management system. Within the context of libraries, the important role that library UX plays in designing so many of the web tools and support structures on which IL instruction relies means that it is vital that the educational ideas that underscore the tools and technologies continue to be both clarified and interrogated. IL instruction introduced a constructivist focus, which positions learning as an active, constructive process, to the classroom almost 20 years ago (Cooperstein and Kocevar-Weidinger 2004). However, the emphasis within library UX on discrete, individual behaviors

threatens to reframe information interactions as responses to environmental stimuli rather than complex processes of engagement that reflect beliefs, desires, and memories, among other concepts. Along the same lines, the prioritization of "interactional phenomena visible to research" (Venkataramani and Avery 2012, 281), which are seen to provide evidence for the design of teaching and learning interactions (e.g., Baird and Soares 2018), illustrates how library UX may also refocus attention on "behavioral indicators" or observable information skills rather than the enactment of complex social practices. These issues call for a more focused engagement between the two fields on the ways in which we can integrate what John Buschman (2012, 105) refers to as "intellectual" rather than marketing-driven approaches to anthropological research, including study designs that incorporate an increased focus on more sustained fieldwork, analysis rather than description, and methodologically rigorous research techniques (Lanclos 2020).

Divergences in underlying pedagogical principles also have a number of implications for library teaching. Library UX's sidelining of social dynamics, for example, which emphasizes the individualization of practice, threatens to position IL as "training" (e.g., Chase, Trapasso, and Tolliver 2016) or as a series of remedial exercises that will improve a user's ability to use library systems efficiently rather than as a transformative and liberatory practice. The focus within library UX on efficiency further risks squeezing out or eradicating valuable teaching opportunities; as library UX practitioner Shelley Gullikson (2018) points out, roadblocks that are perceived to be problematic in a UX sense may, in fact, be providing learners with an opportunity to reflect critically on their actions. It is true that library UX may help to eliminate roadblocks that emerge from unnecessarily complex or poorly designed user interfaces. However, other forms of perceived friction can offer valuable insight into the complex information ecosystems in which learners must engage, as our discussion related to search interfaces in the "Social Dynamics" section illustrates. The recognition that learners seek to prolong as well as to reduce uncertainty during times of transition further demonstrates the generative role that unfamiliarity can play (Hicks 2019), while the shift from skills-based to conceptual models of IL provides further evidence of the move to encompass reflexive rather than functional teaching practices.

An emphasis on seamless UX forms another point of tension between library UX and IL because it contributes to the aura of completeness and closure that surrounds information tools and technologies. The seamlessness and seeming completeness of these products exert "a form of epistemological power," suggesting to students that what can be seen is all that there is to be seen (Asher, Duke, and Wilson 2013, 477). However, seams "are not simply obstacles to a smooth user experience, they're reminders that our online services are themselves constructed. There's nothing natural or inevitable about a list of search results" (Sherratt 2015). Web-scale discovery platforms, as well as Google, strip out that context. As scholar Safiya U. Noble (2018) points out, search engines "mask history" and "oversimplify complex phenomena," while "search results

belie any ability to intercede in the framing of a question itself" (116). Ken Hillis et al. (2013) further argue, "search results gain validity from the performative power of their own 'findability' and immediate utility to a specific searcher . . . not from being based on access to any coordinated sets of knowledge" (73); they are always already true. These ideas suggest that another point of collaboration between library UX and IL centers on search tools, which form a vital yet often overlooked or "mundane" role within information infrastructures (Sundin 2020). Key points to consider include how these sociomaterial structures are shaped, presented, and understood within library contexts and broader educational practices.

At the same time, points of tension between library UX and IL provide a strong indication of the continued need for library instruction; an "operational literacy" (or functional, skills-based literacy) is not the same thing as "critical literacy," to use Tara Brabazon's (2007) formulation. For example, Marissa Mayer describes operational literacy when she notes how "users don't need to understand how complicated the technology and the development work that happens behind [Google] is. What they do need to understand is that they can just go to a box, type what they want, and get answers" (Vaidhyanathan 2011, 47). However, while operational literacy, as it is currently envisioned, might constitute a positive UX, it cannot be seen as sufficient within algorithmic cultures (Lloyd 2019), where information tools are "made and remade" each time they are used (Sundin 2020). Growing understanding of the impact that the delegation of "slices of authority to algorithms" (Lloyd 2019, 1476) has on information interactions calls for a renewed focus on the need to broaden thinking about the ways in which people become "informed users of information" (Lloyd 2019, 1483). A further point of collaboration between library UX and IL then may be to examine how we might make room for the exploratory, complex, and contextual in both UX and interface design (e.g., Whitelaw 2015) rather than reproducing Google, whose goals and values have always differed from those of academic libraries.

Conclusion

The parallels between IL instruction and library UX are striking; although these concepts emerged from very different traditions, both focus on studying and exploring the ways in which users engage with information for research, everyday, and workplace purposes. However, despite these similarities, there has been little prior attempt to examine the ways in which IL and library UX interact, support, and work against each other. These issues are intensified by the work that has been done to push IL around the critical turn. In this article, which is an initial attempt to examine these issues, we contend that a recognition of these differences creates important opportunities for future conversation and collaboration as we seek to support the creation of thoughtful and critically focused educational practices. These opportunities for collaboration include examination of the roles that search engines play within library contexts and the pedagogical principles that underscore both teaching and design.

More specific opportunities include examining how research into CIL could provide a model for more critical approaches to library UX research. Over the past decade, CIL has been explored through the lens of critical race theory, political economy, and queer, antiracist, and feminist pedagogies. How could library UX research draw from this work to problematize design choices and examine how gender, as well as race and disability, shape and impact accessibility (Hamraie 2019)? The important role that time plays in constraining and enabling the ways in which we engage with information further suggests the need to examine the impact of time in more detail. What is the impact of time, which includes distraction, productivity, and the passing of time, on library UX? How might we extend a past-oriented approach to the typically future and present-focused UX research, or a present-focused approach to typically past and future-oriented IL research?

Other points of collaboration include the need for research that examines how the relationship between UX and IL might be abused. The field of behavioral economics promotes the use of nudge techniques or choice architecture to alter people's behavior (Thaler and Sunstein 2008). How might IL be used to justify the design of paternalistic information environments that promote decision-making that librarians deem as desirable? Could the coupling of IL and UX lead to the manipulation of a person's behaviors and activities? Together, these ideas would facilitate a useful way to develop ongoing scholarship and to spark a number of new research directions.

A further specific opportunity would be to examine how we might employ additional theoretical concepts to unpack and analyze the relationships between library UX and IL. A theoretical concept that might serve as a focus for practical activity is the "boundary object"—"abstract or physical artefacts that exist in the liminal spaces between adjacent communities of people" (Huvila et al. 2017, 1807). Boundary objects facilitate coherence and cooperative engagement across communities. Within the context of user-centered library research, the recognition that library websites, catalogs, and service points could form a type of boundary object between the UX and IL communities demonstrates the need to both acknowledge and manage the intersecting purposes of common library artifacts and sites of interaction. David Platzer (2018, 303) has already noted that pain points serve as boundary objects within collaborative workflows: although they refer to a concrete or "real" issue experienced by the user, boundary objects are at the same time willfully vague or flexible, allowing them to be mutually intelligible and strategically deployable within the multidisciplinary framework of the design team. Future research could explore these ideas in more detail including the implications for the enactment of user-centered information practices.

A final opportunity for collaboration relates to the need to examine how pedagogy is entwined and implicated within questions of space, a concept that is traditionally explored through library UX rather than IL. An approach that has been advanced in relation to these issues is information experience design (Bruce et al. 2017). However, although this project integrates useful participatory approaches to research, it remains unclear how it will account

for the complexity of practice and for the messy dynamics that structure learning within complex information environments. Research should also build on Catherine Closet-Crane's (2011) examination of the ways in which learning happens within information commons to further interrogate how learning is promoted and visualized through a perspective of architectural planning and design. As academic libraries continue to struggle with reduced budgets and ongoing existential fears, it is particularly important that our research supports a learner's engagement with complex and dynamic information environments rather than merely ensuring the library's own future as an attractive and trusted content provider.

In this article, we explored the ways in which IL instruction and library UX practices have become interwoven within academic libraries. Through carefully examining the practices and values of each field, we have noted the existence of complementary and shared areas of interest. At the same time, we have shown how the push to embrace a more critical approach to IL has created sites of tension that have the potential to undermine a library's broader educational goals. In doing so, we have noted opportunities for collaboration that will lay the groundwork for the development of more critical and thoughtful educational practices.

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