Library Wayfinding and ESOL Students: Communication Challenges and Empathy-Based Intervention

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abstract: This article describes a wayfinding study conducted in an urban, academic library to better understand the experiences of multilingual student populations. The study, which incorporated traditional user experience methods and video ethnography, exposed communication obstacles and spatial challenges encountered by students of English for speakers of other languages (ESOL) when attempting information retrieval tasks. After outlining the methodology and examining qualitative findings, the authors discuss how study findings prompted a reevaluation of local practices, service models, and staff training protocols. Finally, the authors explore the potential for qualitative, empathy-based wayfinding studies to transform library practices and spaces.

Introduction

To better serve multilingual populations, academic libraries need to understand how these patrons interpret and interact with physical and digital spaces. Way-finding studies that capture students' first-person perspectives as they navigate library environments can provide a framework for examining spaces and patrons' experiences. In this article, the authors describe a wayfinding study conducted in 2018 at the Ursula C. Schwerin Library at the New York City College of Technology. The study's primary goal was to identify and mitigate communication obstacles and spatial challenges that students of English for speakers of other languages (ESOL) encountered while completing common information retrieval tasks. A combination of traditional user experience methods and video ethnography allowed the authors to gain insight into

students' behaviors, emotions, and thought processes as they interpreted information tasks, navigated spaces and service areas, and interacted with library personnel.

When designing the study and surveying literature on library wayfinding, the authors hypothesized that study participants would primarily encounter navigational obstacles related to the layout of the library, location of service points, organization of library materials, and language used on signage and on the library website. While the authors believed a task-based wayfinding study would offer insight into how ESOL students find materials in the library and seek assistance with information retrieval tasks, they did not initially consider how greatly communication with library personnel would influence the participants' experiences. When a

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preliminary review of qualitative findings revealed that communication between study participants and library staff was a central factor that shaped the students' experiences, the authors conducted addition interdisciplinary research into space and human behavior. They also looked to literature in critical theory, anthropology, and psychology during the study analysis phase to better understand the complex and interrelated spatial and communication factors that influence student wayfinding. The following central research questions guided this analysis:

- What common wayfinding obstacles do ESOL students encounter?
- How can a theoretically informed understanding of students' experiences be used to mitigate communication obstacles and create inclusive library environments?

Institutional and Spatial Context

The New York City College of Technology (City Tech) is one of 25 colleges within the City University of New York (CUNY) system. City Tech is an urban, commuter campus in downtown Brooklyn that serves over 17,000 students from across the five boroughs of New York City. City Tech offers a range of two-year associate and four-year baccalaureate degrees and specializes in technical and applied professional programs, such as radiology, entertainment technology, and hospitality management. The 31 libraries across CUNY operate as a consortium and share some consortial platforms, including a library management system. Students within the CUNY system visit other campus libraries, occasionally take courses at other campuses, and frequently transfer from two-year community colleges to four-year colleges within the system.

The authors focused on ESOL populations for this study because 73 percent of students at City Tech report a language other than English spoken at home.[1] Thirty-five percent of City Tech students were born outside the United States, and more than 150 different countries are represented among the student body.[2] While this study focuses on a specific space and student population, the methodology and findings could be applied to better understand other institutional environments or processes and other populations. Further, enrollment trends and student demographics at CUNY mirror broader

enrollment and demographic patterns at colleges and universities across the United States, which indicates that study findings could be extrapolated to better comprehend patron wayfinding experiences at other universities.[3]

The Ursula C. Schwerin Library occupies the fourth and fifth floors of an urban campus that consists of several interconnected buildings. There is one public entrance to the library on the fourth floor, the level that has all the service desks, public computer labs, printers, and support staff. The upper floor of the library, accessible by stairs and a service elevator, contains circulating collections, classrooms, offices, group study rooms, and cubicles for quiet, independent study. The library has five public service desks: an Ask a Librarian desk staffed by one full-time and several part-time librarians; a Borrow and Return desk with a mix of full-time and part-time paraprofessional library staff, including student college assistants; a Tech Support desk staffed by student college assistants; a Multimedia desk where patrons can borrow technology, aided by student college assistants; and a Periodicals desk staffed by student college assistants during peak library hours only. While no statistical data were collected about the language preferences or language acquisition history for library personnel, many of the Ursula C. Schwerin Library faculty, staff, and student workers are multilingual or speak a language other than English at home.

Literature Review

Librarians have long been interested in wayfinding and the strategies people use to "orient themselves in and navigate a space."[4] Although the field of wayfinding has roots in architecture and environmental psychology,[5] studies of libraries dominate wayfinding literature because they are spaces in which the arrangement of the built environment directly corresponds with the order of the library's collections. Considering the complexity of library environments, the diverse populations libraries serve, and the literature on library anxiety and spatial navigation, wayfinding studies offer an important tool for assessing library spaces and better understanding patrons' perspectives, emotions, and needs.[6]

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Environmental Analysis, User Experience, and Video Ethnography

A subset of wayfinding literature focuses on environmental analysis, including examinations of the physical organization of materials and the design and placement of signage, maps, and other navigation tools within libraries.[7] Environmental studies attempt to define "space syntax" through a "formal, quantitative characterization of the environment," which investigates relationships between spatial layout and patron behaviors.[8] The majority of these studies describe the implementation of an internal environmental analysis based on documented best practices from the literature. Some advocate for "design thinking"[9] or empathy-based environmental analytical approaches to evaluate and update signage and service areas,[10] sometimes in the context of larger renovation

projects or in relation to marketing library services and collections.[11] Common best practices for signage design and placement include consideration of patron sight lines,[12] use of minimal signage strategically positioned at points without visible service desks, consistency in terminology and design across physical and digital spaces, compliance with the Americans with Disabilities Act (ADA) of 1990, and use of positive rather than prohibitive language on signage.[13] While much of the environmentally focused wayfinding literature emphasizes the importance of signage to meet the needs of patrons, few environmental analyses specifically discuss wayfinding and signage in relation to multilingual or ESOL patron populations.[14]

Combined with environmental analyses, wayfinding studies incorporating ethnography and user experience methods provide insight into how patrons interpret and navigate library spaces and organizational systems. Many of these studies consider, to some degree, how subjective cognitive factors, including users' environmental expectations and navigation skills,[15] familiarity with the space (or similar spaces), previous experience with tasks,[16] and relationships with digital technology[17] influence their capacity to navigate a space successfully or affect their emotional experience during the wayfinding process. In a comprehensive study of "Wayfinding Tools in Public Library Buildings," Ann Beecher discusses how cognitive maps and relational or "orientational" approaches to navigation influence users' experiences of space.[18]

The most frequently cited methodology used by researchers to better understand user behaviors and spatial perceptions is the task-based study, often combined with the think-aloud protocol (TAP). The think-aloud protocol is a method that allows researchers to observe users, directly or indirectly, as they navigate spaces and asks them to verbalize their thought process as they perform tasks.[19] Overwhelmingly, the goal of task-based studies is to identify and mitigate common navigational challenges or "bump points," the places where users stop or pause as they decide which way to go.[20] Other studies utilize interviews,[21] photo diaries,[22] or surveys[23] to capture qualitative feedback from end users.[24] Often these methods are employed in combination with and alongside environmental scans, systematic surveys of the library's internal and external environment.[25] Drawing from task-based studies, some researchers have developed "geographic networks," "symbolic" navigation models, and even algorithms to analyze, represent, communicate, and predict wayfinding behaviors as a strategy to mitigate navigation obstacles.[26]

Several task-based ethnographic studies the authors examined—of libraries and other public spaces—used GoPro cameras or other wearable video recording equipment to capture a user's navigation trajectory from a first-person perspective.[27] Anthropologists have described the use of wearable cameras as a "tactic of sensory ethnography, [which] refuses the corrective distancing from sensation as a way of knowing the world."[28] Visual culture expert and feminist scholar Anne Harris discusses the interdisciplinary uses of "video as method," its application in fields like "(cultural) geography," and the potential for video-based research to be "multi-perspectival."[29] Digital ethnographers Shanti Sumartojo and Sarah Pink introduce the concept of a "video trace,"[30] which allows researchers to analyze the "specific environmental, sensory, and affective" experiences of users in motion as an important feature of video-based ethnography.[31] While video and audio footage might not provide a holistic understanding of a space or all the users who interact with it, this method potentially enables the "empathic co-creation of

sensory knowledge between researcher, research participants, and potential audiences"[32] as researchers observe the anxiety, frustration, and confusion users experience while navigating.[33] In a departure from most studies in which researchers conduct analysis after the completion of a user study, Sumartojo and Pink reviewed and discussed video footage with study participants to enable a richer understanding of the user's subjective experience of space.[34]

Some wayfinding studies incorporating wearable technology address whether the removal of an observer would decrease the Hawthorne effect, in which the subjects of a study modify their behaviors because they are being studied.[35] Some anthropologists reject the idea that unmediated interactions are optimal, arguing that even performative interactions "reveal profound truths about social and/or cultural phenomena."[36] If ethnographic studies incorporating wearable technology allow researchers to understand space as actively "constituted by the practices" of researchers, participants, texts, and technology, then it may be less important that the camera "limit 'intrusion'" as long as it enables a more holistic understanding of shifting relationships to technology and intersubjectivity that occur within environments.[37]

Libraries, Language Learners, and Interdisciplinarity

While none of the task-based wayfinding studies the authors reviewed specifically focused on the experiences of ESOL or multilingual populations in libraries, some researchers chose to isolate and compare different user populations as they completed navigational tasks. Several studies examined differences in wayfinding between novice and experienced library users.[38] In their library study, Kirsten Kinsley, Dan Schoonover, and Jasmine Spitler hypothesized that gender might contribute to user wayfinding preferences, although this assumption was not ultimately corroborated by their findings.[39] Since the specific population the authors focused on in their study was not well represented in wayfinding literature, they looked at literature on ESOL students and libraries, including research on information literacy and user experience, to inform their study methodology and analysis.

Literature on ESOL students and libraries highlights the importance of using interdisciplinary, qualitative, and nuanced approaches to evaluate interactions between students, library personnel, the library environment, and information.[40] In a 2006 study of language learning in libraries, Karen Bordonaro used iterative semi-structured interviews to learn more about how ESOL students navigate academic libraries, with an emphasis on self-directed use of library spaces, services, and resources to improve language acquisition.[41] While the goal of most task-based wayfinding studies is not to measure language learning, qualitative findings from ethnographic wayfinding literature suggest that participants gain information literacy skills and become familiar with library spaces and terminology as a result of participation in task-based wayfinding.[42] This finding

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reinforces the necessity of looking at wayfinding alongside theoretical literature about information literacy and language acquisition to better understand "how language-students construct meaning within new social and material environment[s]."[43]

Literature on the experiences of ESOL student populations in academic libraries outlines some challenges that these students commonly face when using libraries, including lack of experience with library environments, unfamiliarity with librarian roles, library anxiety, and communication obstacles.[44] Despite the number of references to increased library anxiety experienced by ESOL and international students,[45] a large study conducted in 1997 by Anthony Onwuegbuzie and Qun Jiao found that ESOL students "visit the library more frequently" than other student populations.[46] Linguistics researchers recommend that librarians serving ESOL populations incorporate "theories of second language acquisition" into their praxis[47] and learn more about library anxiety and the emotional experiences of ESOL students through theoretical and behavioral research.[48] Researchers also advocate for multicultural communication training to enable educators and librarians to better understand and respond to ESOL students' needs.[49] Others, however, caution against "ascribing difference and otherness" to library patrons in ways that reinforce white supremacy or linguistic hegemony.[50] The authors found several instances where researchers problematically overgeneralized ESOL populations and offered best practices without engaging with important literature from other disciplines or adequately acknowledging the complicated and divergent experiences of library users, librarians, and paraprofessional staff and their relationships in and to space. Librarian and information studies scholar David James Hudson argues that attempts to develop "complete sets of questions and complete sets of answers [or] to ensure that our language is always going to be intelligible to everyone" are counterproductive. Such efforts undermine the cultural experiences and rhetorical frameworks that patrons and library personnel—including native speakers and others—bring to institutional encounters.[51] When librarians set out to meet the needs of diverse patron populations, Hudson maintains, they should not treat "anti-racism" as a "utilitarian task" or look to "one-size" solutions.[52] Instead, librarians should adopt interdisciplinary approaches that enable an understanding of the "complex sociocultural and embodied nature of information environments" as they impact information literacy,[53] human and spatial relationships,[54] and pedagogical encounters.[55] Critical explorations of place, literacy, and human interaction have yielded important insights into how culture "creates space" and further illustrate why an interdisciplinary lens is so necessary in examining patrons' experiences with spaces in ways that allow for complexity.[56] This literature further underscores the importance of empathy, rather than prescriptive best practices, as an outcome of behavioral and spatial analyses.

Methodology

Adapting a study by Kirsten Kinsley, Dan Schoonover, and Jasmine Spitler,[57] the authors combined a variety of usability and ethnographic methods, including an initial screening survey, a task scenario using the think-aloud protocol (TAP), Web screen capture, video and audio capture, and a post-task debriefing interview. This multivariate approach offered insight into the obstacles that ESOL students encountered when conducting information retrieval tasks and specifically allowed for in-depth qualitative analysis of communication- and literacy-related wayfinding challenges.

The initial screening survey determined potential participants' language preferences, language acquisition history, and comfort level with English. The survey, distributed through student e-mail accounts, was also used to determine eligibility for the study and to collect contact information to set up research appointments. During the study, selected students were given four different information retrieval tasks accompanied by hypothetical common research scenarios and instructed to "treat each task as you would if you were completing them for an assignment" (see Appendix A and Appendix B). The tasks were:

1. Find the novel *The Great Gatsby* in the stacks.
2. Find the textbook *Urban Reader for College Writers* in the reserve collection.
3. Find a DVD in the media collection.
4. Find the Academic Search Complete database on the library's website.

While attempting to complete the tasks, students were observed in a variety of ways. The authors used a designated office for the study, and participants were instructed to return to that room between activities. All students used the same MacBook Air computer and the built-in Web browser Safari and were given the option of using a mouse or track pad. QuickTime screen capture software recorded participants' use of the library website. The authors encouraged users to read each task aloud and verbalize their thought processes as they worked. The authors also sat with participants as they interacted with the website and observed their behaviors directly.

Participants wore chest-mounted GoPro cameras throughout the study. Video and audio captured by the GoPros allowed for unmediated observation of the students' movements, navigation trajectories, interactions with library personnel, and thought processes while they searched for materials in the library. The GoPro video footage and audio provided the authors with insight into specific parts of the wayfinding process that were confusing or frustrating. During real-time analysis of video footage, the authors gained insight into anxieties introduced by navigation challenges and by the implicit pressure participants felt to complete study tasks quickly and successfully.

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After participants completed the four information-seeking tasks, they took part in a verbal debriefing interview and were prompted to reflect on difficulties they encountered with each activity. They also answered questions about library organization schema, signage design and placement, website design, navigation labels, and content. The debriefing interview yielded qualitative insights not captured by the think-aloud protocol, allowing participants to reflect on their experience and provide feedback about signage and spaces. Some interviews revealed contradictions between what participants said versus the experiences captured in video footage

Research Results

Participant Demography

The first 12 students who responded to the intake questionnaire and identified a language other than English as their first language were selected for inclusion in the study. Three participants reported Arabic as their first language, three Spanish, two Cantonese, two Mandarin, one Vietnamese, and one Pashto. Because of the diversity of languages represented and small sample size, the authors did not draw any generalized conclusions about linguistic populations; instead, they analyzed patterns and common challenges shared across the participant pool.

Analysis Methods

After an initial review of video footage, Web screen captures, and transcriptions of think-aloud protocol and interview responses, the authors collected quantitative data, including success rates for each task and time spent. The authors also looked at quantitative metrics, including whether prior library experience impacted success and whether participants who received in-person assistance performed better, without finding any discernible patterns.

Beyond quantitative data, the authors used 44 coded keywords, such as *call numbers* and *stacks*, to identify and analyze transcripts and videos. The goal of the keyword analysis was to assess other factors that contributed to success for each of the four task scenarios and to identify shared physical, digital, and communication obstacles patrons faced. The keywords were collectively determined by the authors after dividing and independently coding a subset of the study transcripts and videos. Specific keywords were used to notate interactions with different library personnel, use of directional signage, references to library spaces, references to library collections, mentions of library jargon or task-specific terminology, physical and digital obstacles or bump points patrons encountered while navigating, and references to the camera or study itself. After developing keywords, the authors reviewed video footage, screen captures, and transcripts of think-aloud audio recordings and debriefing interviews for each participant—meaning each analysis was iterated three times—to ensure keywords were applied uniformly across the participant pool.

Quantitative Findings

The authors found no significant correlation between prior library experience (observed or self-reported) and success rates for tasks (see Figure 1). There was also no significant correlation between time on task and success rate, and prior library experience had no measurable impact on how long participants spent completing tasks (see Figure 2). The authors also analyzed whether the students preferred to use the computer independently or seek out in-person help from library personnel to complete the activities. They found that user preferences and prior experiences with technology and research rather than task type dictated whether computer or human assistance was sought (see Figure 3).

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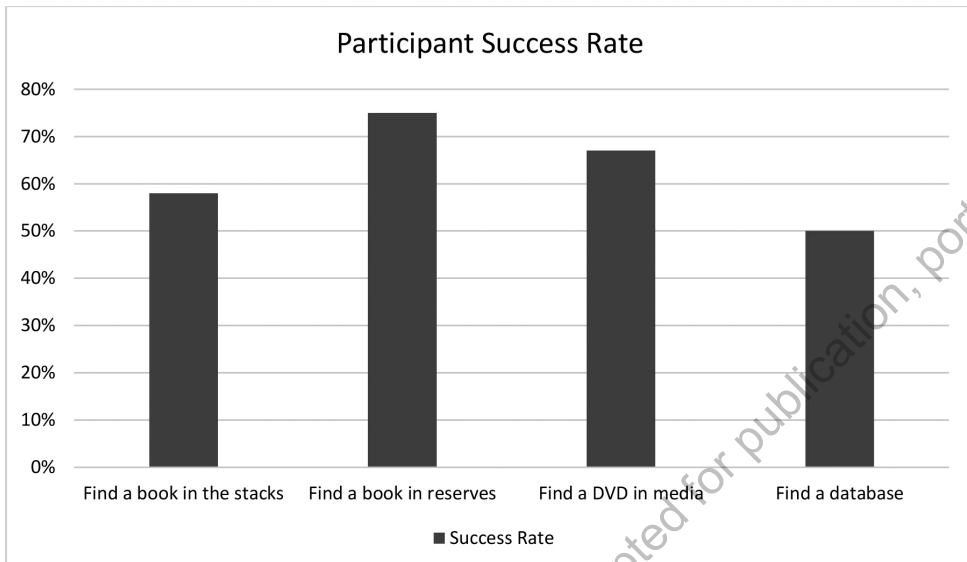
Participant Success Rate

Figure 1. The average percentage of participants, all ESOL students, who succeeded at each of four tasks that required using the Ursula C. Schwerin Library at the New York City College of Technology.

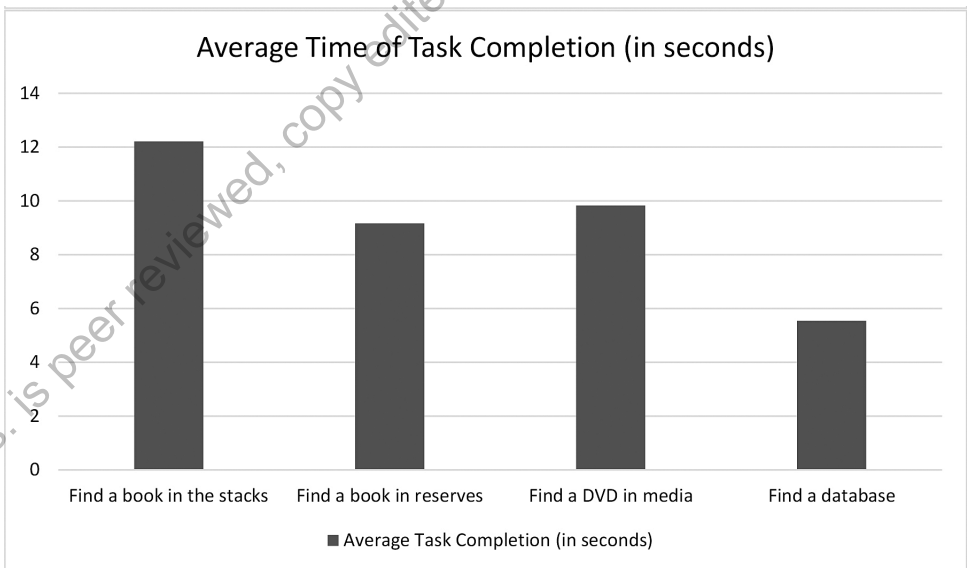## Average Time of Task Completion (in seconds)

Figure 2. The average amount of time (in seconds) that participants took to complete library tasks.
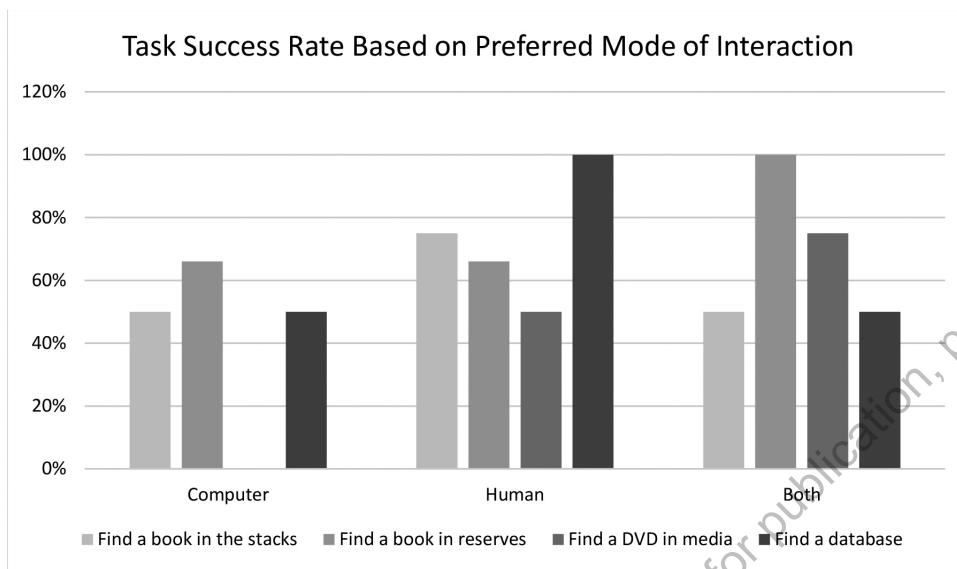
Figure 3. The average percentage success rate on four library tasks for participants who used only a computer, those who sought help from library personnel, and those who did both.

Several participants explicitly indicated that they preferred in-person assistance when they were unfamiliar with library search interfaces or terminology. During task 4, "Find the Academic Search Complete database on the library's website," participant 8, who favored in-person assistance and did not attempt to independently use the website to locate a library database, stated, "I use the computer here only . . . when I want to do some composition." In other cases, students interacted with staff only as a last resort. During task 1, "Find the novel *The Great Gatsby* in the stacks," participant 5 used the library's virtual chat system and searched the library website for a "map that would tell me the different bookshelf locations" before reluctantly leaving the study area to get help from the reference librarian. These findings point to varying degrees of digital literacy across the participant pool as well as different levels of comfort with in-person interaction, which may be related to language or learning preference.

Qualitative Findings

While staffing levels (and staffing shortages) and signage played a role in how partici-pants performed study tasks, the most significant factors that impacted success rates were nuanced and contextual. Digital and information literacy rates, familiarity with library jargon and library services models, and language barriers or miscommunication during interactions with library personnel were the primary factors that affected outcomes.

Digital and Information Literacy

Think-aloud protocol and transcript data revealed that 7 of the 12 study participants had some prior library experience. Most, however, encountered obstacles that indicated gaps

in digital and information literacy. Several participants who said they had previously used the library expressed lack of familiarity with the library's layout, policies, website, and terminology. Many students knew little or nothing about call numbers, library collection codes, and catalog records. Almost all participants interpreted the consortial library catalog, vendor databases, and the library website as one platform. Some could not differentiate between a resource such as a book or DVD and a catalog record for the resource.

Some study participants had difficulty navigating the library website or using the designated computer for the study. During task 3, "Find a DVD in the media collection," participant 12 knew that the location information for the DVD should be available online but "need[ed] help to use the computer."

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Many students had difficulty locating an electronic library database during task 4, and several believed they had completed the activity successfully when they had not, indicating an overall lack of experience with the library website and with electronic library resources. These findings point to different levels of digital and information literacy.

Overall, a lack of information and digital literacy contributed to the anxiety observed by the authors or expressed by the participants and influenced time on task as well as success rates. However, the study did reveal that students learned during the study and applied what they learned to subsequent tasks. Several participants who interacted with the reference librarian during task 1 used knowledge gained to complete task 2, "Find the textbook *Urban Reader for College Writers* in the reserve collection," successfully and quickly. While the library already has a robust instruction program, this finding indicates that librarians should emphasize information literacy during reference transactions whenever possible.

Library Jargon

The majority of study participants were unfamiliar with library jargon and struggled to understand online public access catalog (OPAC) labels such as *media* and terms like *call number*. Students were also confused by small language discrepancies between the task scenarios, website labels, and library signage. For example, participant 7 expressed frustration during task 4 because of inconsistencies between the language of the task scenario, which included the word *database*, and that on the website, which lists databases under a "Find Articles" menu

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header. While navigating the library website, this participant repeatedly stated, "I'm trying to look for like somewhere [where] it says *database*." In several instances, interactions with library staff created more confusion when they introduced new or different terminology while assisting participants.

Participants struggled to identify and understand collection codes and the relationships between the codes and corresponding physical locations in the library. In several instances, library staff referred to call numbers as *the code*, which further increased confusion. During task 3, when participant 11 asked for "the code number" at a service desk, a library staff member first asked for clarification ("the call number?") before confirming, "It's the same thing," rather than explaining the distinction between the terms. While the staff member may have been trying to reassure the study participant that the inquiry was understood, inconsistent use of terminology by library staff can result in confusion and missed opportunities for information literacy learning.

Confusion related to library jargon and a misunderstanding of collection codes and call numbers contributed to the majority of navigation problems participants faced throughout the study. This knowledge gap also accounts for many students spending the most time on task 1, which required an understanding of what the word *stacks* refers to and how the stacks are organized. Further, many participants experienced obstacles when attempting to apply what they learned during task 1 to task 2—which required them to retrieve a book from "reserves"—because they misunderstand library collection codes.

Since the completion of this study, the library has changed collection location labels in the library catalog to indicate the floor of the library where materials are kept rather than relying on collection codes. Since the catalog is a shared resource with 23 other campus libraries, there were limitations on the specificity of book locations within the stacks. As a result, book locations in the catalog display only which of the two floors holds a book but do not indicate a specific area on the floor.

Library Service Models

Video analysis revealed that many participants were unfamiliar with the discrete services offered at different locations within the library despite the descriptive signage displayed at service desks, such as Ask a Librarian and Borrow and Return. Footage also revealed that participants failed to readily differentiate between faculty librarians, paraprofessional library staff, and student college assistants or to understand their respective areas of expertise. Most participants viewed all personnel as "librarians" and were confused when staff and assistants referred them to "the librarian" or "the reference librarian" for help.

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Miscommunication

The authors observed several instances of participants being misinformed by library personnel who failed to fully understand the patron's needs or library procedures. Miscommunication and failed interactions contributed greatly to task failure rates and participant anxiety. During the debriefing interview, study participant 12 identified communication as the greatest obstacle and explained, "Sometimes it's very difficult to express to librarians and other staff about the books and the DVD that I want to look for . . . I would say both language barrier and also not clear how to explain." Several participants were given wrong infor-

mation by library personnel, including misinformation about how and where to access resources on the library website. A paraprofessional staff member incorrectly instructed one student to log in to search for books using the library discovery layer. During task 3, a student college assistant told another participant that the DVD requested must be already on loan instead of checking to verify the collection code. The authors observed

several instances where participants struggled to find material independently using the library website and subsequently requested help from library personnel who only directed them back to the website, even in instances where the students were obviously frustrated and confused. As these examples illustrate, language barriers, lack of multicultural communication skills, and lack of training significantly impacted participants' wayfinding experiences.

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Staffing Levels

The authors also found that staffing levels played a role in navigation and task success rates. When the reference librarian was busy with other students, and particularly when the librarian failed to make eye contact with the participant or communicate when they would be available to assist, participants often sought help from paraprofessional library staff, student workers, or other library patrons. In the debriefing interview, participant 4 observed, "Around 11 p.m. or 12 p.m., a lot of students are . . . already on line, so really hard to ask them a question at that point." While the Ask a Librarian desk was formerly staffed by two librarians during peak hours, service models were modified and staffing levels were reduced in 2016 because of budget constraints.

Video footage illustrated that when the reference librarian was otherwise engaged, participants would wait for less than a minute before seeking help elsewhere. During

task 3, participant 12 asked for assistance from a college office assistant because the reference librarian was helping another patron, only to be told, "If you don't know how to do it on the computer yourself, you go to the librarian. [They have] someone there with [them] right now, so you may have to wait." These types of interactions caused frustration and confusion since participants lacked an understanding of the discrete roles and expertise of different library workers. However, other interactions illustrated that when paraprofessional staff and student college assistants did attempt to assist patrons with reference inquiries, they sometimes provided misinformation or further

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confused participants. Overall, staff shortages and long wait times also led to anxiety and contributed to task failure rates.

"Bump Points"

A preliminary mapping analysis and examination of video footage and think-aloud transcripts revealed common obstacles or "bump points" that student participants faced during the study. Students appeared lost or exhibited signs of anxiety when they were far from service points, struggled to complete tasks quickly, or needed to ask for assistance at the same service desk more than once. Think-aloud protocol transcripts show that several participants remarked on the size of the library or expressed a lack of familiarity with the library layout when they had difficulty locating materials. This indicates that previous library experience also plays a role in spatial navigation.

While time on task was not predictive of success, video footage revealed that participants who spent a long time on tasks would more likely exhibit signs of anxiety or abandon the activities before completing them. For example, subject 9, who spent 17 minutes looking for a reserve book in the stacks during task 2, almost double the average time, circled the same row of stacks multiple times and repeatedly looked at the same call number range before finally asking for help from a college assistant passing by, even though unsure if the assistant was a library employee. Other participants exhibited similar signs of anxiety or a sense of being lost during task 1, the only activity that required them to visit the fifth floor of the library, where there

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are no service desks. Some participants took a circuitous route around the perimeter of the fifth floor before finding the appropriate section of the stacks, even though most had already identified the call number and received navigational directions from the reference librarian.

While many students were initially willing to ask for help at a library service desk, video footage revealed that some participants felt more comfortable approaching student college assistants working in the stacks than librarians or staff at service desks. Most participants seemed reluctant to ask for help from the same service desk more than once, even if this meant abandoning a task in which they had invested a great deal of time. For example, subject 12, who spent 30 minutes on task 3 (almost triple the average time for this task), appeared reluctant to return to the Multimedia desk after an initial failed interaction there. The student ultimately abandoned the task even after the reference librarian helped find the call number needed. When participants did return to the same service desk more than once, they would often approach with an apology, seem hurried, or cut the interaction short before they fully understood how to complete the task at hand.

The authors hypothesize that participants felt pressure to complete tasks quickly because of the study parameters. It is difficult, particularly with a small sample, to know if library patrons without the pressure of a timed study would respond to navigation challenges differently. Outside the context of the study, patrons may not have needed to locate materials from different library collections or ask for assistance at a single service desk multiple times in a single visit. These factors illustrate that the artificial context of a wayfinding study might both reveal existing navigational obstacles and introduce new ones.

Signage

While the authors could not always determine from video footage whether students used and read signs, some participants indicated during the debriefing interviews that they used call number signs and other directional signage and offered their feedback on signage design and placement. Several recommended including more directional signage about call number ranges in central locations in the library and on the website. Participants felt it was important for catalog records to indicate the floor where materials could be found, as both floors in the library had books in the stacks. One student suggested that the library implement color-coded signage to more clearly differentiate between different library collections. Several participants pointed out problematic or confusing discrepancies between the wording on signage, language in the task descriptions, and language used by library personnel.

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Discussion

As the qualitative findings indicate, the primary navigation obstacles that participants faced throughout the study were related to communication and literacy. The authors used a few different strategies—including creating a presentation with qualitative findings and video reenactments—to share study findings with library personnel and subsequently involved library faculty and full-time staff in conversations about the study results.

Overcoming Communication Obstacles

Because the specific communication obstacles that participants faced during the study were nuanced and difficult to summarize, the authors determined the ideal solution would be to share and discuss video clips with library personnel. However, to maintain confidentiality of both participants and library personnel and to honor Institutional Review Board (IRB) conditions, the authors could not share actual video footage from the study. Instead, they created video reenactments of key interactions in which miscommunication led to confusion or contributed to a task failure. The authors believed this solution would allow them to share data while also ensuring that library faculty and staff were anonymized and no one regarded the videos as an indictment of their job performance. The authors arranged an all-library meeting to screen the reenacted video clips and facilitated a discussion about the communication barriers that the videos depicted and what the library could change in future interactions with ESOL students.

Despite the authors' precautions, a subset of paraprofessional library staff was concerned that the video recordings could be used as an indicator of workplace performance. The authors informed all personnel about the study objectives and methodology and allowed staff and faculty to opt out of filming before the study began. The authors

failed, however, to sufficiently consider how power dynamics and hierarchies within the library might influence whether paraprofessional staff, some of whom report to the authors, felt empowered to opt out or express concerns. Another all-library meeting was arranged to discuss concerns about how the videos would be used. The authors clarified that the videos were only a mechanism for internal data sharing and provided more details about the IRB process, with which many library staff were unfamiliar.

Ultimately, the initial controversy about the videos led to a productive dialogue about informed consent and academic research protocols and a broader discussion about power dynamics that shape interactions between library faculty, paraprofessional staff, student employees, and patrons. In designing the study, the authors initially had not considered library personnel as "participants" in the same sense as students because they did not expect communication would play such a large role in the study. Thus, they failed to provide the same opportunities for library personnel to opt in rather than opt out. In future studies that involve the use of video and interactions with faculty and staff, the authors will change informed consent protocols, ensure that all library personnel understand the IRB process, and carefully consider workplace power dynamics in their study design.

Empathy, Literacy, and Labor

The authors were initially concerned that the controversy over the video reenactments might inhibit opportunities to address the obstacles that ESOL students encountered during the study. If anything, however, the dialogue surrounding the study itself offered more opportunities for discussion about library staffing shortages, gaps in training, and the interpersonal dynamics that shape and inhibit interactions between personnel and patrons. After sharing study data and discussing ways to improve communication strategies—both internally and with patrons—the library director arranged an empathy-based, multicultural communication workshop led by professional facilitators for all library personnel. The training allowed for a deeper exploration of communication barriers and power dynamics in the library and a consideration of how issues of race, language background, cultural experience, education, and labor implicitly shaped interactions.

Ideas for mitigating communication obstacles that ESOL students faced during the study did emerge from conversations among library personnel. Proposed strategies included providing information literacy training for paraprofessional staff and student assistants and developing standardized protocols for referral when the library is understaffed. These strategies would potentially reduce the dissemination of misinformation and instances of miscommunication, although this approach also raises questions about labor and expertise. Empathy-based communication strategies coupled with referral protocols would provide a communication framework that all library personnel could use to better determine the needs of library patrons, especially those who lack experience with libraries or who are English language learners. Empathy-based communication would also ensure that paraprofessional staff felt no pressure to provide reference services or perform work beyond the scope of their job titles. Library personnel also discussed how study findings that identified staffing shortages as a source of miscommunication detracting from user experience could be shared with campus administration and be used to advocate for more funding and staff.

Language

To improve communication outcomes and decrease ESOL students' anxiety, the authors led library-wide discussions about ways to center languages other than English in the library, a conversation that included the perspectives of multilingual library personnel and student workers. Library personnel discussed whether new multilingual signage might reduce anxiety and make ESOL students feel more welcome. Based on study findings and best practices from the literature, the authors also recommended that signage be relocated to areas of the library where participants had trouble navigating and where there are no support staff.

When sharing findings with colleagues, the authors emphasized the need for New York City College of Technology Library personnel to use terminology and labels consistently across physical and digital spaces. They introduced several examples from transcripts where inconsistent use of language contributed to failure and created anxiety. While plain language is used on signage and the library website, faculty and staff frequently employed library jargon when referring to service areas, collections, and information retrieval processes. The video reenactments and discussion illustrated how this language inconsistency confused students and contributed to misunderstandings and missed opportunities for information literacy acquisition.

Conclusion

This study yielded important insights into spatial and communication obstacles that ESOL students face when navigating academic library environments. Additionally, this study exposed the ways in which library power dynamics shape interactions, and it provided an opportunity to discuss how issues of race, language, education, and labor influence how library staff communicate with each other and with patrons. Internal analysis of power dynamics and communication patterns provided a framework for examining and implementing changes to library policies, training protocols, and service models that consider the experience of both students and library workers. This study also demonstrated the value of including all library personnel, and potentially even study participants, in wayfinding analyses that use video ethnography to allow for more substantive reflections on specific interactions or spatial challenges. The authors believe that the study methodology and analytical methods have broad applicability and could be adapted by other academic libraries. Additionally, this study methodology could be used beyond academic libraries to understand communication and spatial navigation processes in other institutional environments.

The authors believe that some iteration will enrich their study and plan to conduct further qualitative analysis of coded keywords, transcripts, and debriefing interviews. This additional analysis will likely generate deeper insights into relationships between spatial design, communication, and anxiety. The authors also plan to conduct a separate spatial analysis by mapping participant trajectories for each task and overlaying the maps to determine common bump points. This spatial analysis will inform practical changes to signage placement and service models.

While learnability and library experience seemed to play some role in student wayfinding, this small study collected too few data to draw conclusions or analyze specific

patterns related to these factors. Future studies, with a larger sample or with randomized tasks, might reveal new insights into how learnability and library experience play a role in student wayfinding and allow for comparisons between experienced and novice library users. Finally, further research is needed to assess the impact of the interventions advocated in this article to determine whether multicultural communication training, use of consistent language across physical and digital spaces, introduction of multilingual signage, and increased emphasis on information literacy have a measurable impact on ESOL student experience in library spaces.

Acknowledgments

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Appendix A

Introduction

Thank you for participating in our user test. We're conducting this study to learn about how ESL (English as a second language) students navigate the City Tech library and the library's website. During this study, we'll ask you to complete four short tasks that involve finding library sources. We will use both a camera and screen capture software to record how you navigate digital and physical library spaces. We'll also ask you to think aloud, saying your thoughts audibly, during the study.

After you complete the four tasks, we'll ask you some questions about your experience. This study should take about 60 minutes.

Task Handout

Here are the tasks, take a moment to review them. Questions?

There are no wrong answers for this research study. This is a test of the library's digital and physical spaces and not your abilities. If a task is too difficult, you can move on to the next task and return to that task again later, or discontinue the task. Do the tasks one at a time, and make sure to indicate which task you are doing by saying the task number aloud. After completing each task, return here and then begin the next task. You don't have to physically remove items from the shelves, just find them. If you have trouble finding something, this helps us learn more about how to make that process easier.

You should use the library website and physical space of the library throughout the study, in whatever way you need to, to complete each task. You're welcome to talk to other students or library staff.

Treat each task as you would if you were completing them for an assignment.

As a reminder, please verbalize your thoughts aloud during the study. Feel free to take notes and write on this paper if you need to.

Questions?

Appendix B

Tasks

Use the library and the library website to complete each task. Do the tasks one at a time, and make sure to indicate which task you are doing by saying the task number aloud. After completing each task, return here and then begin the next task.

Treat each task as you would if you were completing them for an assignment. If a task is too difficult, you can move on to the next task and return to that task again later, or discontinue the task. You don't have to remove physical items from the shelves.

1. Imagine that you are in an English 1101 class and you need to read a novel. Using the library, find F. Scott Fitzgerald's *The Great Gatsby* on the shelf.

2. You forgot your textbook at home and need a copy from the library. Using the library, find *Urban Reader for College Writers* textbook on the shelf.

3. Your teacher showed the film *RIP!* in class and you were absent. She told you that you can borrow a DVD copy on reserve at the library. Find the DVD copy of the film and a place in the library where you can watch it.

4. You need a research article for your paper and your teacher told you to use the library's database. Using the library website, locate the Academic Search Complete database.

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