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Guest Editorial

Dungeons and Dragons in the Information Literacy Classroom: How We Taught Bias in a For-Credit IL Class

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In a for-credit information literacy class required by all freshmen students, regardless of major, it is difficult to find consensus when it comes to teaching emotionally fraught concepts such as bias. This editorial addresses those challenges and presents a novel solution to teach bias in class: by having students examine the private lives of fictional characters.

I began my position as the Head of Teaching and Learning at Duquesne University's Gumberg Library in July of 2019. I was eager to begin designing curriculum for Duquesne's required one-credit information literacy class: UCOR 100. Nearly five years later, the course has changed names to BRDG (Bridges, the name of our core curriculum) 100 and my department has designed (and taught) five versions of it. We started with a very traditional in-person class, included an online version for students who could not fit the face-to-face class into their schedules, created a course meant to be taught in a Hyflex environment during the pandemic, and tweaked the classes that followed to address the changing needs of post-pandemic students.

Information literacy skills might have once been a curriculum that could be designed and then retaught over and over, but that's no longer true. A recent, highly cited online survey (Intelligent, 2024)—indicating that at least half of our students were getting their research from TikTok—led to curriculum alterations. Last year, AI widely entered the coursework of many university students (Cotton et al., 2024), and our assignments were adapted to address this (for now). My two-person department must regularly address these kinds of changes to appropriately meet our learning objectives and to ensure the class remains relevant.

Throughout these past five years, as well as during my previous seven years spent at Penn State, I have encountered a variety of instructional challenges. I'm sure I'm not the only librarian who feels like the Boolean Operator "OR" can evade even the most attentive student's understanding. I suspect citations will consistently be something students avoid creating on their own, despite in-class activities demonstrating that citation generators (and ChatGPT) almost always include mistakes (again, I say, "for now"). Certain semesters have been harder

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than others for both student and instructor-related reasons that are tough to predict. But the concept we have struggled with the most has been that of *bias*.

There are a lot of different elements to bias as a concept. There's the unrealized bias we and others carry with us, there's confirmation bias, and many other cognitive biases too.

Within the broad scope of bias, students struggle with a variety of issues on every level when it is taught. For those just beginning to assess their own thinking, the idea that their perspective on wealth, for example, could push them in a certain philosophical or political direction can be extremely offensive. This hits a nerve so sensitive that, when we attempted to teach this concept, more than a few student surveys included threats to instructors' jobs and/or called our character into question, sometimes using crude language.

Another surface-level difficulty is the erroneous idea—which students bring with them from early lessons on the difference between subjective and objective information—that *anything that carries a bias is automatically wrong*.

Comparing opinion pieces on the same topic—for example one from the centrist *Wall Street Journal* and the other from the liberal *Slate*—tends to confuse students. They often come to the table believing that, if both of these perspectives aren't automatically "incorrect" because of their bias, then one of them *has* to be "correct." Different media sources or online personalities can exacerbate the issue by claiming to share "only the facts." The concept of reading different perspectives and using those perspectives to inform their own thinking is often challenging for students to approach.

We could blame social media, helicopter parents, or the widely decried declining rigor in high school, but I think the truth falls closer to the developmental reality of "black and white thinking," in our students' lives. Black and white thinking, also described as "lower formal operational thought" by Piaget scholars, is a stage of thinking where concepts are not approached with nuance. They are either right or wrong, yes or no, etc. Research indicating that large portions of first-year college students are not reaching "full formal operational thinking" (a more nuanced form of logic labeled by Piaget) has been recorded since the nineteen seventies (Adi, 1980; Shcwebel, 1975). For many students black and white thinking doesn't start to fade until the end of their college career. You can't expect a freshman to develop the nuance of four years of college instruction during a one credit class, or worse, a one-shot of course-related instruction.

In my experience, teaching about confirmation bias causes discomfort in students no matter how many peer-reviewed studies or clever videos—explaining that having confirmation bias is universal and doesn't make them "wrong" or a bad person—I share with them. The idea that the human brain has the tendency to confirm that whatever it already believes is right is not an easy concept to accept, especially when this challenges the information they've consumed on social media, from their parents, and other trusted sources to create the worldview they rely on.

For both practical and ethical reasons, an information literacy course with a learning objective that addresses "evaluating information sources" can't easily ignore the issue of bias. My department worked for years to address the concept of bias and, though student learning was present, the results were never particularly satisfying. We were always left with no real indication of how we could improve our curriculum to make the concept of bias easier for us to teach and for the students to comprehend.

After attending a teaching retreat in the summer of 2023, it struck me: what if we took the student's characteristics and beliefs out of the equation altogether? Not because they don't

matter, but because current students—due to a variety of forces that impact post-pandemic Gen Zs—prefer an element of trust in both their instructor and classmates before they are willing to participate in class discussions or group work that requires any sort of vulnerability. Building trust takes time, often far more than can be established in a traditional three-credit course, let alone the single credit our class is allotted.

It was in this instructional situation that we created the Bias Character Sheet.

Inspiration for this assignment comes from several influences far-removed from the retreat where the assignment was conceived. Probably the biggest inspiration was the role-playing game *Dungeons and Dragons*, as well as the myriad similar games which require players to create a character and then solve problems as that character along with a team of other created characters. One of the most enjoyable elements when playing a RPGs (role playing games), is that you can create—and then play as—any kind of character you like. Your player can be exactly like you, or you can play someone who acts in a way you'd never behave in a million years. Although I cannot say that character creation goes without any judgement in every D&D game, I'd definitely describe it as a safer sphere than revealing your own political party to an entire college classroom.

Another source of inspiration for the Bias Character Sheet was the creative culture found in social media fandoms where folks, young and old, create OCs (original characters). For many, these characters will never end up anywhere other than the creators' imagination, but that doesn't matter; they're still respected as a viable outlet of creativity within the communities where they exist. OCs run the gamut of being avatars very similar to their creators, to personalities in the fictional universes their creators are currently interested in, to unique characters who are generated completely independently. Once OCs are conceived, creators describe how their OCs would react in certain situations, collaborate with others' OCs, and so on—an exercise in both character building and, frequently, socializing.

The Bias Character Sheet allows students to select a character, any character, and fill out a series of questions about that character's personality, values, and other elements that could affect personal bias. The character can be a fictional character that already exists (Sponge Bob is popular), a character the student has just made up, or a real person, (with the requirement that this person is someone who the student has little chance of ever meeting). Once a character is selected, the student begins to fill out the elements of their life. The instructor informs the class that while it's expected they try their best, there is no "right" or "wrong" in this assignment. Students select everything from education level to sexuality (a number of folks think Sponge Bob is gay), to immigration status (Shrek is an excellent example of a character who is not a citizen in the land where he lives) for their characters. Student engagement during a required one-credit information literacy course is hard-won, but with this assignment, students were generally excited, sharing what they'd done with the groups they sat in, as well as with their instructors. They had frank open conversations about what it would mean for Sponge Bob if he weren't straight, wondering if it would be accurate to describe Taylor Swift as a billionaire, and many other things. Students had fun, and started to reflect on how personal beliefs and involvement can affect their assessment of the things they read, as well as their perspectives in things they produce. Most of all, they were talking to each other without fear, building a classroom community much less judgement.

Nearing the end of class, students were shown several TikToks, some humorous, some more serious. They were tasked to discuss how they thought that their characters would

react to each short video with the members of their table. These questions were often lively. Throughout the rest of the fourteen-lesson course, instructors were given the opportunity to go back to the character sheet, asking students questions related to the characters that they had created. This allowed students to address the complexities of personal bias without feeling threatened.

The structure of this assignment allows students to keep their personal identities and political/religious/etc. beliefs private. Many students in previous classes were quick to react to divergent ideas as "political," something that used to be a vital part of the college experience. The ultimate goal—one which goes far beyond this class—is to bring together groups with differing beliefs or identities that would otherwise immediately shut each other down. This assignment also allow students who espouse conflicting beliefs to understand and respect both their own biases, as well as the biases of others, allowing them to confront each other in a measured and respectful way both in the information they encounter, and in conversation. The dearth of this type of discourse at all levels of education is the focus of many complaints, from parents to teachers to employers to students themselves.

There is a persistent idea in that college freshmen should "toughen up or fail," when it comes to learning difficult concepts or exiting their comfort zone. We believe that—since it is completely normal and healthy for many eighteen-year-olds to not have established the ability to distance themselves from black and white thinking—forcing "mental toughness" on them is a pointless exercise. Our activity instead is a primer, allowing them to safely explore different perspectives and how these perspectives play out in the information ecosystem. It is not meant to exist in a vacuum, but instead to support students as they approach more complicated ideas in their major-specific classes, giving them the capacity to research, write, and debate in a respectful and productive way.

And in the end, it's fun for us too.

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A Three-Year Mixed Methods Study of Undergraduates' Information Literacy Development: Knowing, Doing, and Feeling

Ellen Nierenberg, Mariann Solberg, Torstein Låg, and Tove Irene Dahl

This article reports results of a mixed-methods study following the development of undergraduates' information literacy over three years. Information literacy knowledge and skills in this sample (n = 116) increased with time, as did information literacy attitudes when measured by interest and information literacy's perceived usefulness and importance. Correlations among students' information literacy knowledge, skills, and attitudes also increased with time, implying a progressively stronger integration of the three. Complementary interviews with 13 students revealed that they became more interested in being information literate. Some experienced an identity change as a result of this development, indicating that transformative information literacy learning can occur.

Introduction

The term *post-truth era* is often used to describe modern society, in which "objective facts are less influential in shaping public opinion than appeals to emotion and personal belief."[1] The term *post-truth* became common after the 2016 US presidential election and Brexit referendum in the UK, when misinformation spread by public figures became more prevalent. Of course, misinformation arises from and is distributed by other sources as well, including artificial intelligence-based chatbots. These major challenges in our information environment make it difficult to distinguish between fact and fiction and underscore the importance of information literacy (IL) skills, such as the ability to critically evaluate information.

Information literacy is defined in this study as encompassing, "the knowledge, skills, and attitudes needed to be able to discover, evaluate, and use information sources effectively and appropriately in order to answer questions, solve problems, create knowledge, and learn."[2] As expressed in the Association of College & Research Libraries' *Framework for information literacy in higher education*[3] [ACRL Framework], these competencies are composed of cognitive,

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behavioral, and affective elements. They are essential in education, the workplace, and daily life, for navigating the information landscape in the post-truth world, for critically evaluating information, and for becoming responsible citizens and reflective, lifelong learners.

In higher education, academic librarians and teaching faculty have long contributed to students' acquisition of critical thinking skills and other necessary information competencies through information literacy instruction and assessment. We believe it is important to facilitate students' development beyond simply learning to *perform* information literacy skills and on toward *becoming* information literate adults. The aim of this study is to explore how students' information literacy competencies develop, as well as how their perceptions of themselves as information literate people evolve during their college years. Are there glimmers of transformative information literacy learning or notable changes in students' identities as information literate people?

There are two main research questions in this study:

1. How do undergraduates' information literacy knowledge (*know*), skills (*do*), and interest in being or becoming information literate (*feel*)—and their interaction—change during the first three years of higher education?
2. Is there any evidence of transformative information literacy learning in students? If so, what does it look like, and how do students experience it in relation to their identity as information literate people?

We used a pragmatic, emergent mixed methods approach to examine the development of information literacy knowledge, skills, and feelings—referred to as *knowing*, *doing*, and *feeling*—in undergraduates over three years. Mixed methods research involves employing and integrating quantitative and qualitative methods to reach deeper understandings of research questions.[4] Mixing occurs both as each strand's data, results, and inferences informs the development of the next strand, and in the integrated analyses of final findings. We created new questions in both surveys and interviews if the need arose after analyzing previously collected data, for example in asking interviewees to explain unexpected survey results.

Theoretical Grounding

Important concepts in our exploration of information literacy development are grounded in interest theory and transformative learning theory. This section describes the study's theoretical grounding and provides a brief overview of relevant literature.

Information Literacy Development

Studies over time, with or without specific interventions, often focus on one facet of information literacy, such as Rosman et al., who found an increase in students' information-seeking knowledge over three semesters.[5] Broader studies, encompassing several aspects of information literacy development over time, are more challenging to undertake and less prevalent in the literature. There is a need for more research to fill this gap and better understand students' longer-term information literacy learning. Due to our belief in the importance of a more personally integrated information literacy, we find value in studies that assess information literacy *knowing*, *doing*, and *feeling*, and especially those that explore relationships among the three, over time.

Pinto and Fernández-Pascual explored short-term learning in their quantitative study of Library and Information Science students, where they measured changes in knowledge,

skills, motivation (defined as *self-efficacy*), and attitudes (defined as *belief in importance*) for a set of information literacy competencies. When measuring these components before and after a one-semester intervention, they found positive, significant relationships among some, but not all, of the competencies. Scores for information literacy knowledge and skills were lower than for self-efficacy, showing a miscalibration between students' actual and believed skills.[6] We found, however, no longitudinal research following information literacy *knowing*, *doing*, and *feeling* over a longer period. To assess information literacy knowledge, skills, and interest, we developed four quantitative measures (described in "Materials").

Interest and Meta-awareness

Information literacy instructors strive to teach in the best possible manner to help students become information literate individuals. To explore its relationship to information literacy learning, the measurement of *feeling* in this study is based mainly on interest. Interest is conceptualized as an exploration-related feeling linked to both the psychological state of an individual engaged in certain content, as well as their motivation to continue that engagement. Interest influences learning by increasing both attention, expended effort, cognitive functioning, and the realization of goals.[7]

Our operationalization of interest is informed by Hidi and Renninger's four-phase model of interest development. Their model describes ways in which interest changes over time, and thereby has implications for both learning motivation and teaching methods.[8] The model describes four qualitatively distinct phases of interest, from triggered situational interest (the most fleeting and situation-dependent) to well-developed individual interest (the most stable and independently pursued). Each phase has a unique psychological architecture described by the relationship among four variables: 1. Situation dependence, 2. Positive affect, 3. Competence, and 4. Meaningfulness.[9]

The four-phase model was first operationalized in a reliable and conceptually valid way by Dahl and Nierenberg, who tested it both with (i) self-chosen objects of interest, such as playing the bassoon, and (ii) a specific interest, namely interest in being or becoming information literate.[10] We use the Tromsø Interest Questionnaire (called TRIQ) to measure interest in being or becoming information literate in the current study.[11]

Transformative Learning

Transformative learning theory is used as a lens to explore information literacy learning. Transformative learning was introduced in the 1970's to describe perspective transformations in adults that can occur after critical reflection of previous life experiences, assumptions, and beliefs.[12] Mezirow believed that transformative learning represents a paradigm shift, as it induces more comprehensive behavioral changes than other kinds of learning.[13] Mezirow's theory has received criticism for being too cognitively oriented and lacking social and emotional elements of learning, as well as for not adequately capturing what it is that gets transformed in transformative learning.[14] Pedagogue Knud Illeris suggests that it is a person's *identity* that gets transformed, and proposes a revised definition of transformative learning, namely: "all learning which implies changes in the identity of the learner."[15] Illeris adds that transformative learning, "implies a qualitatively new formation [in a learner] … something more than the acquisition of new knowledge and skills… [which may] include changes and transformations in the learner's general experience and behavior."[16]

Personal identity, according to psychoanalyst Erik Erikson, consists of both our perceptions of ourselves and how others judge us; it forms mainly during youth and remains stable throughout life. Illeris and others, including sociologists Bauman and Giddens, maintain, however, that personal identity can change throughout life, thus supporting Illeris' supposition that identity is something that can be transformed.[17]

Transformative learning can be differentiated from other types of learning in several ways. It refers specifically to learning in adults, after critical self-reflection, that leads to profound changes in both our perspectives and behavior.[18] In addition, transformative learning is learning that changes our identity,[19] and that is irreversible.[20]

In their literature review examining transformative learning within the context of academic libraries, Hooper and Scharf explore how transformative learning theory can inform librarians' information literacy teaching. They note that the ACRL Framework for information literacy has clear references to transformative learning, including *threshold concepts*, defined as, "core or foundational concepts that, once grasped by the learner, create new perspectives and ways of understanding… [and] produce transformation within the learner."[21] Other studies from the perspective of the information literacy educator include Chatterjee and Nichols Hess, who discuss how transformative learning can inform information literacy instructional practice in higher education. Kenney studied transformative learning in public library users, none of whom were students. Hucks et al. combined the perspective of the student and the instructor by exploring how teacher education students displayed evidence of transformative learning when teaching information literacy in practice.[22] Other than Hucks et al., we have found no studies that investigate transformative information literacy learning from the student perspective.

Our research thereby fills gaps in the information literacy literature by: 1. studying the development of relationships among information literacy knowledge, practice, and feelings over time; 2. exploring transformational information literacy learning *in students* (as opposed to *educators*, who are more commonly studied), what it looks like and how students experience it in relation to their identity as informational literate people; and 3. reestablishing the construct of interest, an important motivator for learning, into the literature.[23]

The Current Study

We studied the development of information literacy in undergraduates over time, using mixed methods. We employed quantitative methods during the first half of the study. It gradually became clear, however, that these methods alone were not sufficient to answer the research questions. We therefore employed qualitative methods during the second half of the study, enabling us to explore students' perceptions of their information literacy development more deeply.

This article is divided into three sections: first the quantitative and then the qualitative studies, including methods and results, and lastly the mixed methods section, where the quantitative and qualitative findings are integrated and discussed.

Quantitative Changes in Knowing, Doing, and Feeling Scores

Methods

Study Design

This study measures development in information literacy *knowing, doing,* and *feeling* in psychology undergraduates at the world's northernmost university, The Arctic University of Norway (UiT). We employed four measures, described in "Materials," to quantitatively

examine students' information literacy development over their first three years. These tools measure their: 1. knowledge of core facets of information literacy (*know*), 2. skills in evaluating sources (*do*), 3. skills in using sources (*do*), and 4. interest in being or becoming information literate (*feel*).

Using these tools, we collected data cross-sectionally during students' first and sixth semesters. For some of the sixth-semester respondents, we had also collected data three years previously, at the start of their first semester. Although we did not include these matched-sample, first-semester data in the *cross-sectional* study, where data from the same individual cannot be repeated, we did use them in a complementary *longitudinal, matched-sample* study together with sixth-semester data taken from the cross-sectional study for these respondents. The cross-sectional study thereby measured the development of different students at the same point in their educational trajectory, while the longitudinal study followed the same students over time to examine in more detail what they *know, do,* and *feel* related to information literacy. In this exploratory research, we were able to identify trends and validate results by comparing results of the cross-sectional and longitudinal studies.[24]

Materials

The four measures employed to assess information literacy—*knowing, doing,* and *feeling*—make up the *Tromsø Information Literacy Suite* (TROILS) and are freely available for others to use.[25] Additional details about the development and testing of the measures, including evidence of their reliability and validity, are described in Nierenberg et al. and Dahl and Nierenberg.[26]

Knowing. The Tromsø Information Literacy Test (TILT) is a 21-item, multiple-choice, psychometrically evaluated test designed to assess undergraduates' knowledge of three core, source-based facets of information literacy: finding, evaluating, and using sources.[27] There are seven items in each facet, each with four alternative answers, one of which is most correct. Maximum test score is 21 points.

Doing. Students' information literacy skills in practice are assessed, using mandatory assignments, for source evaluation and source use. These two measures arguably have inherent validity, as they are designed by teachers partly to assess these abilities.

Source evaluation scores are based on mandatory assignments in the first and sixth semesters. Students find scholarly sources for their first-semester final papers, as well as their sixth-semester bachelor's theses, and describe why they consider each to be a reliable, scholarly source. In this research, three randomly chosen sources from these assignments are analyzed based on three criteria:

1. Quality: how scholarly the source is, on a scale of 0 (not scholarly) to 3 (scholarly).
2. Variety: number of unique source-evaluation criteria in the annotation, for example authority, relevancy, or accuracy. Each specific criterion is worth one point.
3. Frequency: total number of instances source-evaluation criteria appear in the annotation. Each criterion is worth one point.

The total score is the sum of the quality, variety, and frequency scores for the students' three sources. Scoring was performed by three raters in the first assignment, then averaged. Interrater reliability was found sufficient (intraclass correlation coefficient [ICC] = .89).[28] A qualified rater from the first-semester assignment scored the sixth-semester assignment, so all ratings are comparable.

Source use scores, with a maximum of 5 points, are based on students' first-semester final papers and sixth-semester bachelor's theses. For both assignments, students were required to incorporate scholarly sources and cite them in APA style.[29] The overall use of sources was assessed using five criteria, each worth 0-1 point:

1. Are scholarly sources used to support arguments?
2. Are sources cited in the text when necessary?
3. Are in-text citations written in correct APA style?
4. Is the reference list written in correct APA style?
5. Are all in-text citations listed in the reference list, and vice versa?

The assessment of source use in the first semester was performed by three raters. Raters calibrated their scoring to increase reliability, and interrater reliability was found satisfactory (ICC = .92).[30] In the sixth semester, two raters assessed assignments and interrater reliability was again found sufficient (ICC = .93).

Feeling. Defined in terms of interest in being or becoming an information literate person and measured by the Tromsø Interest Questionnaire (TRIQ).[31] TRIQ consists of a self-assessed phase of interest and six theoretically based subscales: 1. General interest, 2. Situation dependence, 3. Positive affect, 4. Competence level, 5. Competence aspiration, and 6. Meaningfulness. The subscales are derived from key variables that underly the psychological architecture of each phase of Hidi and Renninger's four-phase model of interest development.[32]

Participants

When research began in fall 2019, we recruited psychology students from two programs, a three-year bachelor's program (n = 75) and a six-year professional studies program (n = 52). All students had the same information literacy instruction, starting with an academic writing course with embedded information literacy in their first semester, and all had instruction in literature search in their third year.

Cross-sectional. We collected data for the cross-sectional study from cohorts that began in 2017-2019. For the 2019-cohort, we analyzed data from those students who participated in the survey (including TILT and TRIQ) in their first *or* sixth semester. For those who completed the survey in *both* semesters, we only included sixth semester data in the cross-sectional study, so no data from the same student were duplicated. The 2019-cohort had two mandatory assignments in their first and sixth semesters that we used to measure practical skills in source evaluation and source use (*do*). Bachelor's students in cohorts that began in 2017 and 2018 (n = 80) had one comparable source-use assignment at the end of their sixth semester, namely their bachelor's theses. Since these cohorts had the same information literacy instruction and assessment criteria as the 2019-cohort, we included their theses in the cross-sectional, source-use data. Students from the 2017 and 2018 cohorts, however, had no *source-evaluation* assignment in their sixth semester, which explains why there are fewer participants than in the *source-use* assignment for that semester (see table 1).

Matched sample. Matched data in the longitudinal study is from the 2019-cohort, who we followed over three years. Thirty-three of these students completed the survey (*know, feel*) in their first and sixth semesters. For the assignment-based measures (*do*), there is matched data only from students in the bachelor's program: source-evaluation data for sixteen students and source-use data for eighteen students.

Procedure

We collected TILT (*know*) and TRIQ (*feel*) data from the 2019-cohort at the start of the first semester and end of the sixth semester.[33] We recruited students via their Learning Management System (LMS) and email and we offered prizes for participation.

With students' informed consent,[34] we linked source-evaluation and source-use data (*do*) from mandatory, written assignments in the first and sixth semesters together with TILT and TRIQ scores. We assessed the use of sources in the first six pages of students' final exams in semester one and bachelor's theses in semester six, where the nature of the writing is the same.

We performed data analyses in IBM SPSS Statistics. For the cross-sectional study, independent sample we employed t-tests to compare first- and sixth-semester data from the four measures, as the assumptions for parametric tests were fulfilled in most cases.

For the longitudinal study, the non-parametric Wilcoxon signed rank test with exact statistic for matched samples enabled us to do the simplest, conservative analysis and still determine whether there were changes of note between the first and sixth semesters.[35]

Results

Cross-sectional Analyses

Semester one and six scores on the *know* (TILT), *do* (Source evaluation and Source use), and *feel* (TRIQ) measures in the cross-sectional study are provided in table 1.

TABLE 1
Independent-Sample T-Test Results. Cross-Sectional Data For *Know*, *Do*, and *Feel* Scores in Semesters One and Six

Measure	Semester 1			Semester 6			*t*	*p*[a]	Cohen's *d*
	n	*M*	*SD*	*n*	*M*	*SD*			
TILT	64	12.20	2.44	52	15.69	2.31	7.842	<.001	1.46
Source evaluation	78	9.65	2.94	34	11.45	2.44	3.137	.002	0.65
Source use	73	3.01	1.11	93	3.70	0.76	4.791	<.001	0.75
TRIQ									
– Interest phase	63	2.44	0.84	52	2.44	0.94	-0.013	.990	0.00
Subscales									
– General interest	63	4.41	0.92	52	4.15	0.86	-1.550	.124	0.29
– Situation dep.	62	2.82	1.12	52	3.03	1.12	0.980	.329	0.18
– Positive affect	60	3.91	0.98	52	3.68	0.85	-1.290	.200	0.24
– Comp. level	62	2.78	0.99	52	3.56	0.97	4.181	<.001	0.79
– Comp. aspiration	62	4.74	0.98	52	4.03	1.17	-3.559	<.001	0.67
– Meaningfulness	60	4.52	0.89	52	5.12	0.95	3.407	<.001	0.65

[a] Two-tailed *p*

Scores on TILT and the source-evaluation and source-use measures range from two thirds to almost one and a half standard deviations higher in semester six compared to semester one. Independent sample t-tests showed significant increases over time for scores on TILT and the source-evaluation and source-use measures, as expected. Interest phase remained the

same over time, while TRIQ subscales show varied results. Significant results include growth in "Competence level" and "Meaningfulness," which could be expected, and a decline in "Competence aspiration."

Matched Sample Analyses

DEVELOPMENT OVER TIME

Results of the Wilcoxon signed rank test for matched samples, to examine *know, do,* and *feel* over time in the longitudinal group, are found in table 2.

TABLE 2
Wilcoxon Signed Rank Tests with Exact Statistic for Matched-Sample Comparisons of Semesters 1 and 6, *Know*, *Do*, And *Feel* Scores

Variable		Semester 1		Semester 6		Pos. Rank	Tie	Neg. Rank	Z	Exact sig.[a]
	N	*M*	*SD*	*M*	*SD*					
TILT	33	13.30	2.36	15.76	2.39	24	6	3	4.175	<.001
Source evaluation	16	10.10	3.45	11.58	1.80	10	0	6	1.501	.140
Source use	18	3.43	1.20	3.86	0.70	11	1	6	1.593	.116
TRIQ	33									
– Interest phase		2.48	0.76	2.30	0.88	7	15	11	–1.108	.318
Subscales										
– General interest		4.41	1.03	3.97	0.78	9	3	21	–2.307	.020
– Situation dependence		2.62	0.97	3.15	1.16	20	3	10	2.061	.038
– Positive affect		3.96	0.91	3.55	0.81	9	3	21	–2.445	.013
– Competence level		3.08	0.84	3.46	0.89	17	4	12	1.973	.048
– Competence aspiration		4.72	1.07	3.73	1.16	6	4	23	–3.786	<.001
– Meaningfulness		4.76	0.82	4.93	0.86	18	3	12	0.866	.395

Note: Positive ranks indicate higher scores in semester 6 than semester 1 (growth), and negative ranks indicate lower scores in semester 6 than semester 1 (decline).

[a]2-tailed

As shown by mean scores and ranks, there were significant improvements for TILT (*know*) in the longitudinal group. Source-evaluation and source-use scores (*do*) show growth as well, but this growth is not statistically significant.[36] Finally, in terms of what students *feel*, results from TRIQ subscales indicate similar trends as in the cross-sectional group, with the same subscales increasing or decreasing over time. "Meaningfulness" increased slightly and students reported that their "Competence level" improved significantly. However, their "General interest" decreased significantly, along with their feelings of "Positive affect" and "Competence aspirations," while, as one would expect with these decreases, their "Situation dependence" significantly increased.

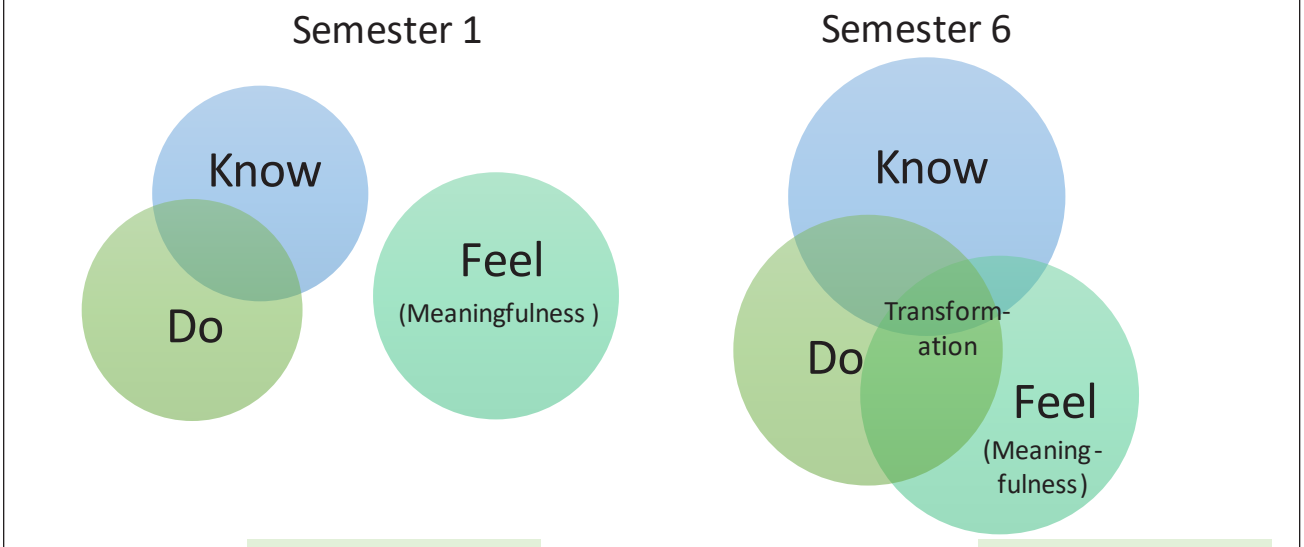
Data from cross-sectional and matched-sample groups are comparable, regarding both values and trends for each variable. The matched-sample results thereby corroborate findings from the cross-sectional sample.

COMPARISONS BETWEEN *KNOWING*, *DOING*, AND *FEELING* OVER TIME

To examine how relationships between *knowing*, *doing*, and *feeling* developed between semesters one and six in the cross-sectional sample, we analyzed scores on TILT, the two *do*-measures, and TRIQ's "Meaningfulness" subscale. Since each TRIQ subscale measures a different aspect of interest, it gives no meaning to average them, as with the *do*-measures. We chose the "Meaningfulness" subscale to represent overall interest because: 1. it has positive, significant correlations to students' interest phase in both semesters; 2. it increases most with interest phase, both in theory[37] and in practice;[38] 3. it contains items that are relevant to students' interest in being or becoming information literate, as well as to its usefulness and importance; and 4. it is generally recognized in the field of educational psychology that both interest and the motivation to learn increase when activities are found meaningful.

Figure 1 is a qualitative illustration of information literacy growth, from semester one to six, in the cross-sectional data (in tables at the bottom of the figure). All scores were transformed to percentage correct in relation to the highest score achieved in this semester. Circle size represents mean percentage scores for *know* (TILT), *do* (average of source-evaluation and source-use percentage scores), and *feel* (TRIQ Meaningfulness subscale) measures. All three mean scores increased significantly over time. Overlapping areas between circles represent Pearson's *r* correlations. These illustrate areas where transformative learning may occur (see "Discussion"). Correlations also increase, though only the *do-feel* correlational change is statistically significant.[39]

FIGURE 1
Mean Scores and Correlations for Knowing, Doing, and Feeling (Meaningfulness) in Semesters 1 and 6, for Cross-Sectional Data



Mean score (diam)		Correlations (*r*) (overlaps)	
Know	58.1	Know – Do	.22
Do	59.6	Feel – Know	-.09
Feel	66.5	Do – Feel	-.19

Cross-sectional data

Mean score (diam)		Correlations (*r*) (overlaps)	
Know	74.7	Know – Do	.30
Do	72.8	Feel – Know	.18
Feel	75.2	Do – Feel	.37

Qualitative Reflections on Information Literacy Change

Methods

Participants

We collected qualitative data in focus groups and individual interviews. Participants were sixth-semester, undergraduate psychology students from UiT, recruited via their LMS and email. Thirteen students participated in interviews—nine in focus groups and four in individual interviews.

During spring 2021, we conducted focus groups with students who began the psychology bachelor's program in 2018, who were then in the final semester of the three-year program, writing their bachelor's theses. There were three students in each of the three focus groups. Seven of the nine participants were women; the two men were in different groups. These students had the same curriculum and information literacy instruction as the cohort that began in 2019.

During spring 2022, we conducted individual interviews with four students who began studying psychology in 2019. Two were enrolled in the three-year bachelor's program and currently writing a bachelor's thesis, and two were in a six-year professional study program.[40]

Materials

Interview guides for focus groups and individual interviews included questions about students' perceptions of their information literacy development, the importance of information literacy for them, and their interest in being or becoming information literate people. Interview guides for the individual interviews included additional questions related to transformative learning and identity.

We also used an "interest-o-meter" during individual interviews.[41] This is an empty graph onto which participants plotted their levels of interest in being, or becoming, an information literate person during the past six semesters. The y-axis shows the intensity of the interest, and the x-axis is the timeline, in semesters. This graph, together with participants' simultaneous commentary and responses to other interest-related questions, provided us with a richer account of their interest development.

Procedure

Thirteen students volunteered and consented to participate in interviews. At the start of each interview, we presented the procedure, the definition of information literacy used in the project, and information about the participants' privacy. The lead author conducted focus groups digitally in spring 2021, and we provided all participants the opportunity to answer each question. We conducted individual interviews face-to-face in spring 2022. Interviews were semi-structured, providing the opportunity to pose follow-up questions and allowing students to introduce new topics. We audio recorded and transcribed interviews verbatim, without emphasizing dialect or emotional expressions.

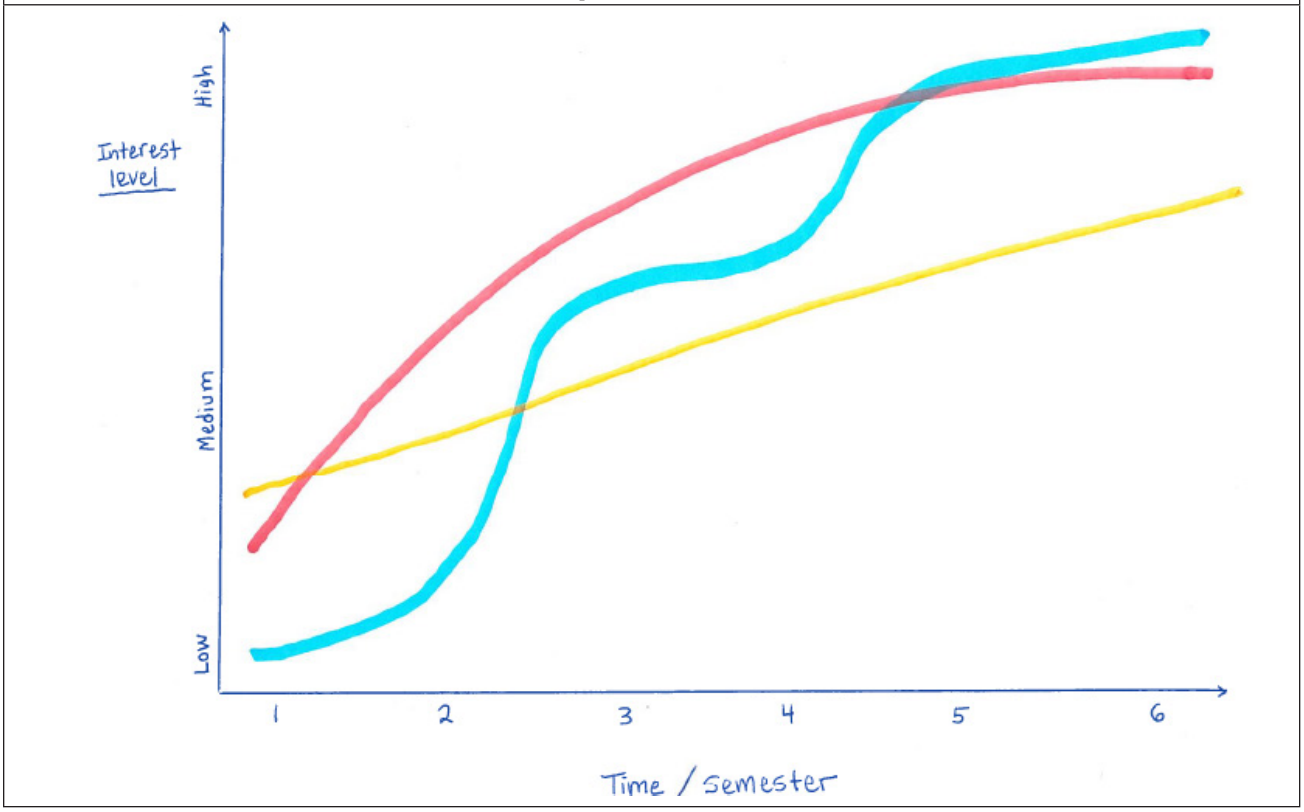
To detect any transformative information literacy learning, we chose to analyze the data thematically. This would help us identity and organize patterns of meaning, thus revealing the semantic content of students' responses to interview questions regarding their development. Two authors of this article performed the analysis in several stages using Braun and Clarke's[42] six-phase model for thematic analysis,[43] one of the most highly cited models for thematically analyzing interview material in the qualitative literature.

After familiarizing ourselves with the data, we began coding the transcripts in NVivo. In the first stage of coding, we employed an inductive approach, creating codes to sort and describe the empirical data. In the next stage, we reorganized codes, splitting some and merging others. This stage was more abductive, informed by theories of transformative learning and identity, and focused on the study's research questions. The subsequent creation of themes was based on these codes, with the intention of making meaningful patterns in the dataset that would contribute to answering research questions.

When confirming whether these themes were supported by enough data, however, we found that more data pertinent to transformative learning were necessary. We therefore conducted follow-up individual interviews with three of the four participants from the first round, those who showed signs of transformative learning. In this round, this article's second author interviewed students to see if new questions and a different interviewer's style could stimulate more detailed responses regarding any transformative learning that may have occurred. The interview began by asking participants to plot their interest levels, per semester, on the interest-o-meter while commenting on their interest development and answering impromptu questions based on their visual representations. Subsequently, the interviewer posed a question based on an unexpected survey finding: "We have seen in the quantitative study that interest in being/becoming information literate decreased over time. Why do you think this might be the case?"

After this last round, we performed a thematic analysis based on codes from all interviews, identifying major themes in the data relevant to our research questions. Results of the interest-o-meter and thematic analysis are presented below.

FIGURE 2
Interest-O-Meter Showing Three Students' Interest in Being or Becoming Information Literate People over Six Semesters



Interest-o-meter

Use of the interest-o-meter combined graphical, quantitative depictions of three students' interest in being, or becoming, information literate people over six semesters, with simultaneous oral accounts of this development. Figure 2 shows the three drawings in the same graph. To give a brief snapshot of how students described their experiences, Kari (yellow) explained that her interest in the first semester was medium-low but rose steadily to medium-high by the end of her sixth semester. Magnus (red) drew a gradually tapering upward curve depicting rapid initial growth and slower subsequent growth, with interest levels increasing from low-medium to high. He explained that he was more interested in being information literate than in information literacy in general. Amy's growth (blue), from low to high interest, was more cyclical, with jumps to higher plateaus each successive academic year. She commented that information literacy is interesting when important, but not as a subject in itself.

Results of Thematic Analysis

Based on transcripts of focus groups and individual interviews, we created sixty-two inductively surmised codes, with up to thirty references per code. We then combined and semantically systematized similar codes into hierarchical categories, yielding twenty-eight main codes and forty subcodes. Based on these, as well as the research questions and the theoretical framework, we deductively identified five major themes. We described these themes below and illustrate them with (translated) quotes from interviews. The themes are presented in the order of the research questions. Names are changed to protect the anonymity of participants.

1. Development in Information Literacy *Knowing*

When inquiring about their information literacy knowledge development, all participants expressed considerable growth. Magnus began intentionally learning more about information literacy after realizing its usefulness and importance. He also mentioned how becoming more knowledgeable can lead to a change in identity, stating, "when we had information literacy instruction, I suddenly realized how much I didn't know and have since been trying to learn more…. Obtaining more knowledge in general contributes to a change in one's identity."

Terry described how her knowledge regarding the use of sources developed during her time at the university as follows:

> Starting with my first course at the university, we've been taught *how* to cite sources academically and *where* to cite them. This information has been repeated in almost all courses I've had … so [my knowledge] has developed.

Vance exemplified an additional risk of *not* being information literate and pointed to the difficulty of knowing which sources to trust. He said:

> It's interesting to look at the consequences of *not* being information literate, how dangerous it can be to simply consume information without being critical, both in extremist and other political environments.

2. Development in Information Literacy *Doing*

When asked how their abilities to find, evaluate, and use sources had developed, most students expressed substantial growth in all three areas. Source evaluation was where their greatest information literacy growth had occurred, followed by searching for sources. Those planning to continue their education expressed the need to learn even more about finding and evaluating sources because of their instrumental value; they still had use for these skills.

Learning to search more effectively for reliable sources represented an important breakthrough for several students. Ingrid was not alone in learning how to search for information other places than Google or Wikipedia. She shared, "In high school I thought that an information literate person searched in Wikipedia … It was an *a-ha* experience for me when we learned about PsycINFO."[44] Similarly, Thor's abilities to find and evaluate information sources developed considerably during higher education. He said:

> I didn't know what it was to be critical to sources before I started college. I've really made a huge leap. Everything—from how I read, to where I choose to find information, to how I evaluate it—has changed, evolved.

Several participants told of great strides in learning why, when, and how to cite information sources. The following quote shows Ingrid's development in reference technique in her written work:

> Compared to my first year at the university, [citing sources] has become almost automatic. It's embarrassing to look at my reference lists then compared to now. APA style has become a good friend.

Plagiarism and its consequences were often mentioned as risks of *not* being able to cite sources correctly. Several participants, including Vera, were afraid of plagiarizing unintentionally, especially when writing in a non-native language. She said:

> I hope I haven't plagiarized!… It's hard to know where to draw the line between plagiarism and paraphrasing… There's a gray zone there, especially in English, with my limited vocabulary. It's hard to find equally precise words as in the source.

3. Interest in Being or Becoming Information Literate

In TRIQ and interviews, instead of inquiring about students' interest *in information literacy*, we asked about their interest *in being or becoming information literate people*. The distinction between the two is significant, as the latter is more relevant for one's identity. Although we expected student interest in information literacy to be fairly low, we thought that they might still recognize the value and importance of being or becoming information literate, and thereby have a potential interest in that aspect of their identity. This was the case for the students quoted below. For them, information literacy is mainly instrumental, something they need to write papers and pass their courses. They are not necessarily interested in *becoming* information literate, but recognize that by *being* information literate, they can achieve their goals. Amy said, "I don't know if *interest* is a word I'd use to describe it, but I think it's *important* to

be information literate," while Fred responded, "I'm quite interested in *being* an information literate person… The main goal is to succeed as a student."

Eli's feedback is an example of how interest in being information literate can be triggered by a certain situation where information literacy skills are required, how need can drive interest. He said:

> I thought much less about [being information literate] before I started studying…I felt that I didn't need to learn more about information literacy before we had [database search] instruction this semester. I benefited greatly by learning to search in databases.

4. Development in Information Literacy Attitudes

Participants felt that their attitudes about being information literate had developed during their undergraduate study. This evolution took place as a result of acquiring and using information literacy skills, including critical thinking, both in their studies and in daily life. Kari, who was writing her bachelor's thesis, expressed this change in attitude after illustrating her development as an information literate person on the interest-o-meter. Compared to her first year, she now cares more about the quality of her work and about complying with the conventions of academic writing. She shared, "[I'm now] more involved and feel more ownership of what I write. I care much more about the product and will make sure that it's good quality." Similarly, Arthur reflected on his growth as a critical thinker, regarding both the consumption and creation of information, saying, "You learn a lot in just three years as a student, especially about becoming more critical of the information you receive….[I now] think critically about things I post, for example in social media."

The need for information literacy skills, for example when writing papers, often triggered interest in being or becoming information literate. For example, Ingrid's attitude about the importance of citing sources has evolved as she herself is becoming an information producer. She said, "the more papers I write, the more I realize how important it is to that I [cite sources] correctly."

And when asked which values and characteristics she generally associates with information literacy, Amy mentioned curiosity and an "open-minded critical approach." She felt that these characterized her as an information literate person.

5. Changes in Identity

Several students revealed that their perceptions of themselves (personal) and how others view them (social)—which is our understanding of *identity* in this study—had changed as a result of becoming more information literate. The following quote reveals that Amy's perception of herself has shifted; what she calls an *identity change*, and what Illeris would consider evidence of transformative learning.[45] Amy said,

> I must have become [a more information literate person] without noticing it! When we talk about it now, absolutely, it has become a part of me, I have become very critical of what people say and where they get it from… It's the *situation* [university] and *practice* [colloquia] that have played the biggest roles in my identity change…I'm very happy that I've become an information literate person.

While Amy described her transition in an academic setting, Ruth and Heidi referred to daily life. Becoming critical of what people say and the sources they use represents a change toward a more critical way of thinking. From Mezirow's perspective, this would be considered a change in "frames of reference"[46] and from Illeris's perspective, this would be considered an identity change, both of which are indicative of transformative learning.[47] Ruth shared, "After three years at university, I feel that I'm somewhat more competent than my parents… Becoming more information literate has made me a stronger person in a discussion context because I know how to express my opinions in an academic way," and Heidi said, "[I now] have less confidence in what I hear and see, and I have a greater need to verify… so I know what basis others have for what they say."

Other students also spoke about personal changes as a result of becoming more information literate. Several felt more capable of arguing effectively, both in written work and in discussions with family and friends. They experienced that other people's perceptions of them had therefore changed, and that they were now being taken more seriously. This can be considered a change in social identity. It should be kept in mind, however, that changes in identity varied in degree from glimmers to stronger indications.

Critical self-reflection—questioning the validity of one's beliefs—is another indication of an identity change, and an important characteristic of transformative learning. In the following quote, we see how Amy critically reflects on her previous behavior: "I now think twice before making assertions. I've always blurted out claims quickly… but now I'm better at waiting a little."

Mixed Methods

Integrating Findings

Table 3 integrates results from the quantitative and qualitative studies. Columns contain: 1. quantitative results from *know* (TILT), *do* (Source evaluation and use), and *feel* (TRIQ subscales) measures in the cross-sectional study; 2. corresponding qualitative results; and 3. quotes from interviews.

TABLE 3
Integrated Results Matrix: Undergraduates' Perspectives on Their Information Literacy (IL) Development

Quantitative Results	Qualitative Results	Example Quotes
TILT scores increased significantly.	When asked about the development of their information literacy knowledge, students described how they now know more about searching for, evaluating, and using information sources.	"You learn a lot in just three years as a student. At least about becoming more critical of the information you find."
Scores on practical assignments involving the evaluation and use of sources increased significantly.	When asked about the development of their information literacy practice, students described being much better now at finding, evaluating, and using information.	"I have developed several skills, especially how to cite correctly. And how to do good searches and evaluate sources, how good they are. I would say that is what has changed the most."

TABLE 3
Integrated Results Matrix: Undergraduates' Perspectives on Their Information Literacy (IL) Development

Quantitative Results	Qualitative Results	Example Quotes
TRIQ scores decreased over time for "General interest," which includes questions about interest in IL, and interest in being or becoming information literate.	When asked to speculate why survey results showed decreased "General interest" over time, students thought that information literacy may be considered by some to be most exciting when they first began learning about it, while it was still new.	"The first year there were lots of people who were much more interested, it was probably a little more exciting, you were a little more 'wide-eyed.' And now there are many who are bored. There are many who will not go on to a master's and are tired of school."
TRIQ scores for "Situation dependence" increased slightly over time.	When asked the extent to which their interest in being or becoming information literate is dependent on the situation, students answered that yes, it is situation-dependent, both previously, currently, and in the future.	"If I further develop [my IL], then it is for use in work or study. It is mostly dependent on the situation that requires it."
TRIQ scores for "Positive affect" (pleasure, happiness, curiosity, engagement) decreased slightly over time.	When asked how feelings regarding their information literacy have changed over time, some students described initial growth, but then a gradual decrease in positive emotions.	"I've been through the whole emotional register… [Now there is] less frustration and less joy, just a kind of tacit acceptance that this is how it is, this is how it must be done, and that it's important."
TRIQ scores increased significantly for "Competence" levels.	When asked how their information literacy abilities have developed with time, students spoke of significant improvements since beginning in higher education.	"[As a new student] my information literacy competency was low, and I've since been trying to learn what I wasn't good at, like searching for information." "I am now more competent in finding sources and evaluating them. It's self-efficacy… Now I have a feeling of mastery."
TRIQ scores decreased significantly for "Competence aspirations."	When asked to speculate about why "Competence aspirations" decreased in survey results, students described how the more they knew about IL, the less ambition they had to learn more.	"[In the first year] there was potential for improvement, so I became more interested, because I wanted to reach a higher level." "[As a student] it is important to *be*, but not necessarily to *become*, information literate."

TABLE 3
Integrated Results Matrix: Undergraduates' Perspectives on Their Information Literacy (IL) Development

Quantitative Results	Qualitative Results	Example Quotes
TRIQ scores increased significantly for "Meaningfulness."	When asked about how the meaningfulness of information literacy has changed for them, several students mentioned how it has become more meaningful regarding their present and future education and in everyday life, often referring to its instrumental value.	(*In education*) "I would describe my interest as very high now, especially since I'm working on my bachelor's thesis. There is a need for competence, and everything I've learned so far is being tested in this task. So I feel that [IL] is highly relevant and that I am interested in it." "I now have an understanding of why it's so important to be information literate." (*In everyday life*) "Regarding avalanche knowledge, I have become very interested in this after coming to Tromsø and I feel information literacy is extremely relevant for deciding which sources to use, what is reliable." (*Could it be a matter of life and death?*) "Yes, it could. It's so extreme."

Note: In the right column, authors' words are in parentheses.

Though we saw the changes described in table 3, not all students followed the same trajectory, as indicated by the interest-o-meter (figure 2); nor did every student express their growth in the same way, as indicated in the focus groups and interviews; and not all of these reflections were expressed by all interviewees. As such, there is substantial evidence of growth, though notable variation in the details of how and when students grow as information literate adults.

Discussion

Research Questions

The first research question in this study asks how *know, do,* and *feel*, and their interaction, change over the first three years of an undergraduate education for psychology students at a Norwegian university. Regarding information literacy knowledge and skills, we found—as expected—that both increased significantly with time in the quantitative data. Pinto and Fernández-Pascual, Rosman et al., and Scharf found similar results, although their studies followed students over only one to three semesters.[48] We also found analogous results in interviews, where all informants experienced substantial growth in their information literacy knowledge and skills, articulating having grown mainly through *doing*. Assignments fueled their information literacy interest and the development of further knowledge and skills.

In addition to interviews, we assessed *feel* using the interest measure TRIQ. Tables 1 and 2 show some TRIQ subscales increasing and others decreasing with time. The quantitative increases in "Competence level" and "Meaningfulness," which could be expected, were also

expressed in interviews, where students felt that their information literacy knowledge and skill levels increased simultaneously with information literacy's meaningfulness for them. Students expressed interest in acquiring information literacy knowledge and skills when these were necessary for specific tasks; the need for skills fueled their interest.

Other subscale changes were more unexpected, such as declines in "General interest" (in information literacy and in being/becoming information literate) and "Competence aspiration" (desire to learn and do more with information literacy). This may be due to students' lesser-felt need over time to acquire additional information literacy skills, beyond those already learned. Students' changing interest phases can explain other unexpected subscale variations (see tables 1 and 2). For example, in the four-phase model of interest, lower interest phase signifies lower "Positive affect" and higher "Situation dependence," which we observed.[49] Paradoxically, while interest phase declined or remained stable when measured quantitatively, interviewees expressed *increased* interest over time, also in interest-o-meters. This discrepancy may be due in part to interviewees being more motivated than others, as indicated both by their participation in interviews, their felt social expectations to communicate positive growth, or the fact that several intended to continue with graduate studies, and thereby had a further need for their information literacy skills.

Interactions between *knowing*, *doing*, and *feeling* over time are shown by correlations in figure 1, as well as in interview material. When using the Meaningfulness subscale as a quantitative measure for *feel,* all correlations increased with time. The concurrent acquisition of information literacy knowledge, skills, and interest—and their interaction—together with results from the qualitative study, supports our assertion that transformative learning regarding information literacy may have taken place, as discussed below.

As for the second research question, students' perceptions of themselves as information literate people have clearly evolved during three years in higher education. This is evident both in TRIQ responses, where students reported substantial growth in their perceived information literacy abilities and in information literacy's meaningfulness for them, and in interview responses (see table 3), where students spoke of feeling more competent and confident in their abilities to find, evaluate, and use sources, and in their ability to argue effectively. But it this learning *transformative*?

We believe that there are glimmers of transformative learning and identity shifts in this study and base this claim on the defining characteristics of transformative learning stated earlier in the article. Transformative learning refers specifically to learning:

a. …*in adults*. Third-year undergraduates are young adults with responsibility for their own learning.
b. …*after critical self-reflection*. Students shared that, after three years of higher education, they now question the validity of their previous beliefs and values. They have become less prone to believing and spreading false information and more aware that their previous methods of searching for information were ineffective. They better understand the importance of citing sources properly and have more integrity as knowledge creators.
c. …*that leads to profound changes in perspectives and behavior.* Several students told of behavioral changes in how they find, consume, and communicate information, and that they have become critical thinkers—basing their judgements and actions on reliable sources and deliberate, sound reasoning rather than emotional responses.

d. *…that leads to changes in identity.* In interviews, some students' words described identity changes—both how they perceive themselves and their perceptions of how others judge them.[50] They feel more competent and confident in their information literacy abilities, use them in their education and daily life, and observe that others take them more seriously now that they base their arguments on reliable information.
e. *…that is irreversible.* When asked in interviews whether they could forget what they had learned about information literacy, students replied that they would always remember the major tenets of information literacy, such as the importance of critically evaluating information sources. (Future research would be required to determine whether this indeed is the case).
f. *… implies a qualitative change in the learner, beyond the acquisition of new knowledge and skills*.[51] Several respondents expressed precisely this type of change, as exemplified by the selected quotes.

These illustrations offer examples of what transformative information literacy learning and identity change might look like. Teachers can use this when planning and monitoring their instruction to encourage transformative change. In terms of scholarship, such evidence can be valuable fodder for future research.

By employing mixed methods, where quantitative and qualitative findings are integrated and reinforce each other, the evidence for transformative learning is strengthened. Quantitatively, we believe that the increase in correlations between *knowing, doing,* and *feeling* results (see circle overlaps in figure 1) indicates that these become more tightly integrated with time, and that this can be interpreted within a framework of transformative learning. We imagine transformations taking place as this integrated whole of cognitive, behavioral, and affective dimensions gradually becomes part of one's identity.

Qualitative results strengthen this supposition. Some interviewees described identity changes (i.e., transformations) as they became information literate people, including changes in their attitudes and behavior. This was the case both when our questions included the word 'identity' and when identity was operationalized in other terms rather than named explicitly. An example of an operationalized interview question concerning identity as an information literate person is: *Has your development and learning of information literacy changed your opinions or how you fundamentally think?*

Participants indicated that they used their skills in settings beyond academia— evidence of transfer—when they spoke of broadly applying their information literacy abilities. Information literacy instructors may benefit from taking information literacy's transferability into consideration when teaching.[52]

Limitations

A limitation of the quantitative study is the relatively small sample size for the source-evaluation measure (*do*) in the sixth semester. In the cross-sectional sample, only some students—those in the bachelor's program—had a source-evaluation assignment that semester. In the matched sample, few of the original students continued studying for three consecutive years, likely because of the pandemic.

Although qualitative research in general does not strive to be representative, it is worth mentioning, as a limitation, that interviewees were possibly more interested in information literacy than others in their cohort, given that they volunteered for interviews. Secondly,

a limitation with interviews that require retrospective assessments of development is that respondents may not accurately recollect past experience. Had we interviewed students at separate points along their trajectories, instead of just their sixth semester, we may have obtained different results. Thirdly, by including the word 'identity' in some interview questions, we may have prompted interviewees to use this term when they otherwise may not have. However, since we also posed questions based on our operationalization of identity, without using the term, we heard different perspectives from which to detect any changes in identity and thereby obtained a broader understanding of students' development.

Future Research

Ideas for future research include: 1. comparing our *know, do,* and *feel* findings with other institutions of higher education; 2. comparing evidence of information literacy growth and transformation from students who have information literacy instruction embedded in their studies, to those who have one-shot instruction; 3. comparing results from information literacy measures with students' grades or completion rates to determine how information literacy levels are associated with outcome measures; and 4. studying growth with qualitative interviews along the entire student trajectory rather than just at the end.

Conclusion

This article contributes to the body of information literacy research in several ways: 1. by following the development of undergraduates over three years; 2. by its use of mixed methods; 3. by assessing three aspects of information literacy development in parallel: knowledge, skills, and feelings (as measured by students' interest in being or becoming information literate people); and 4. by looking for signs of transformative learning in students.

Information literacy is a heterogeneous construct encompassing cognitive, behavioral, and affective elements, and research aimed at understanding information literacy development should therefore strive to touch upon all of these. Our mixed methods design, with its pragmatic, emergent nature, proved valuable in answering our complex research questions. The integration of quantitative and qualitative data enabled a more comprehensive description of students' information literacy development than either method on its own would have achieved.

For those of us who teach information literacy, this research shows that our efforts are worthwhile. Findings indicate firstly that students' information literacy knowledge, skills, and interest—when measured by the meaningfulness of being or becoming information literate—tend to increase with time, as do the associations among them. Secondly, students become more critical to information and self-reflective, and may undergo a change in identity as a result of becoming more information literate. Such changes are indicative of transformative learning, a perspective transformation where individuals re-evaluate previous beliefs and assumptions to create new insight and meaning, a result that many educators strive for. Thirdly, when designing information literacy instruction and assessment in the context of higher education, we should keep in mind that relevant tasks in which information literacy skills are incorporated and assessed fuel students' interest and thereby their motivation to learn these skills.

Information literate adults are essential for a healthy, thriving society, and information literacy instruction is therefore urgent and important work for helping students become bet-

ter able at managing information in our post-truth era. As one student astutely commented, this can sometimes even be a matter of life and death.

Notes

1. Oxford Dictionary, "Post-truth," accessed June 6, 2021, https://www.lexico.com/definition/post-truth
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26. Nierenberg, Låg, and Dahl, "Knowing and doing;" Dahl and Nierenberg, "Tromsø Interest Questionnaire."

27. We do not imply that information literacy consists exclusively of these facets, only that they are crucial to the construct, as shown in the framework analysis of information literacy definitions, standards, and frameworks. See Nierenberg, Låg, and Dahl, "Knowing and doing."

28. Nierenberg, Låg, and Dahl, "Knowing and doing," 88.

29. Although this assignment requires APA style, any reference style can be used with this measure.

30. Nierenberg, Låg, and Dahl, "Knowing and doing," 88.

31. TRIQ, and evidence of its reliability and validity, are found in Dahl and Nierenberg, "Tromsø Interest Questionnaire."

32. Hidi and Renninger, "The four-phase model."

33. TILT and TRIQ were included in a Qualtrics survey.

34. The Norwegian Centre for Research Data (NSD) approved the consent form sent to all participants. Only those students who consented to participation after reading this form were included in the study.

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36. This is likely a result of the smaller sample size.

37. Hidi and Renninger, "The four-phase model."

38. See figures 1 and 4 in Dahl and Nierenberg, "Tromsø Interest Questionnaire."

39. Fisher's $z = -1.962$, $p = 0.049$. None of the six correlations are significantly different from zero, hence we cannot claim that these patterns will necessarily hold for the population without further testing.

40. One male and one female from each of the two programs participated in individual interviews.

41. The interest-o-meter was modeled after Audun Hetland and Joar Vittersø, "The feelings of extreme risk: Exploring emotional quality and variability in skydiving and BASE jumping," *Journal of Sport Behavior* 35, no. 2 (2012).

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43. The six phases in this model are: 1. Familiarizing yourself with your data, 2. Generating initial codes, 3. Searching for themes, 4. Reviewing themes, 5. Defining and naming themes, and 6. Producing the report.

44. PsycINFO is a database for the discipline of psychology.

45. Erikson, *Identity: Youth and crisis*; Illeris, "Transformative learning and identity," 40.

46. Merizow describes "frames of reference" as the assumptions and values that affect how we view the world. Jack Mezirow, *Learning as transformation: Critical perspectives on a theory in progress* (San Francisco, CA, USA: Jossey-Bass, 2000, 5).

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Along for the Journey: Graduate Student Perceptions of Research

Alissa Droog, Kari D. Weaver, and Frances Brady

Graduate students' identities and personal lives are heavily tied to their experiences of research, and many struggle to find, understand, and use information for research purposes. Using a drawing exercise rooted in visual research methods combined with semi-structured interviews, a research team in the United States and Canada explored graduate student perceptions of research with nineteen participants. Thematic analysis identified six themes: research is abstract; research is an odyssey; social support makes or breaks the student experience; research is an emotional continuum; interplay between identity/values; information is problematic. The study has implications for how librarians support graduate student research.

Introduction

Graduate students are increasingly becoming a demographic of interest and focus for academic library services and programming. This burgeoning interest in the field originates from the desire to better support the scholars, and subsequent library champions, of tomorrow as well as the recognition that graduate students are interacting with in-depth, often interdisciplinary, research that needs holistic support. Despite these trends, graduate students' information behaviors and research experiences have received significantly less notice in the literature than undergraduates or working professionals. This study fills that gap and helps those academic library individuals who work closely with graduate students to better understand their perceptions of, and experiences with, research to address their needs more fully.

Literature Review

Student Information Behaviors

Studies in the Library and Information Sciences (LIS) field have focused on the student experience and self-conception of information seeking for the past thirty-five years.[1] Existing studies in the field have emphasized the literature review as paramount in considerations of graduate student research.[2] However, this study looks at the research process holistically during the entirety of graduate level study, connecting this work more strongly to the existing literature on student information behaviors and affect in research. Several theories that

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underpin information-seeking behavior have primarily focused on particular populations: Kuhlthau's theory of information-seeking behaviors derived from work with primarily high school students;[3] sense-making theory has studied undergraduate students;[4] and cultural-historical activity theory has looked extensively at information use and conceptualization in the workplace.[5] Existing studies on graduate research behaviors have primarily examined how they used search strategies or perceived library resources, not the overall research process.[6] Furthermore, the majority of studies that do consider graduate students as a particular population have focused on those studying the humanities,[7] or education[8] rather than looking at students from diverse areas of study.

Largely missing from the existing literature are more holistic examinations of how graduate students—who are themselves being trained to participate in and conduct significant research—participate in and experience research as a phenomenon. This gap is partly due to the nature of training that graduate students receive while in their programs. There is a conception by faculty that graduate coursework adequately prepares students to engage in research. However, graduate students themselves report an overall lack of attention to their preparation as researchers.[9] Within graduate programs, the purpose of research is determined by the level of study, with an emphasis on direct application of concepts at the master's level and the ability to advance the knowledge of a field at the doctoral level.[10] These factors in graduate student research training are further complicated by the increasing emphasis on interdisciplinarity in research, the requirement of interdisciplinary and interinstitutional research teams, and the need to develop graduate student identity across all areas of professional and research practice during the course of study.

How, then, do graduate students learn to do research and arrive at original research ideas? Jurisevic found that students needed to pull from their own lived and professional experiences to iterate within their research.[11] Golde suggests it is an emphasis on apprenticeship with experienced faculty researchers that develop research capacity.[12] Boyce et al. found that a clear understanding of the processes for funding, publication, and authorship developed these abilities.[13] Wessels et al. created a model to depict affective-motivational dispositions needed to attain research competence (RC) in moving through challenging situations in the research process.[14] Impacting these considerations of how students seek information is a fulsome understanding of the affective domain as it applies to research tasks.

Affective Dimension of Research

Kuhlthau asserts in her seminal information search process model that feelings correlate with thoughts and actions throughout the entire research process, from uncertainty at the beginning to relief after search closure.[15] Students often initially hold a negative bias against research,[16] which impedes successful research. When patrons lack motivation, they stop their search.[17] Conversely, positive attitudes—such as motivation to learn, personal investment in learning, enjoyment of learning, and sense of accomplishment—impact cognitive and sensorimotor success in research.[18] For example, phenomenological interviews demonstrate that passion for a topic motivates students to continue their search.[19] LIS studies divide the learning process into three domains: affective (feelings), cognitive (thoughts), and psychomotor (actions).[20] Some studies assert that a continuum characterizes the affective domain from primary neurological responses to foundational genetic characteristics.[21] Schroeder and Cahoy define the affective domain by its components: "attitudes, emotions, interests, motivation, self-efficacy, and values."[22]

In 2015, the Association of College and Research Libraries (ACRL) developed the Framework for Information Literacy for Higher Education (Framework) to aid librarians and faculty in teaching information literacy. In addition to knowledge practices, the Framework addresses dispositions, "which describe ways in which to address the affective, attitudinal, or valuing dimension of learning."[23] Several studies analyzed which frames connected to college students' experiences of research.[24]

Most information literacy research regarding the impact of the affective domain on the research process studied undergraduate populations,[25] with a few outliers reviewing other populations: high school students,[26] faculty,[27] and information science graduate students.[28] Most studies involved interviews.[29] Two studies watched participants in a search process.[30] While Nahl and Tenopir did involve non-library science graduate students,[31] the study involved users who were new to using electronic databases due to the study's date in 1996. Previous studies have not used visualization or drawing as part of their interview process to learn about students' affect regarding the research process.

Visual Research Methods

The use of visual research methods may provide new insights to graduate perceptions of research. Used throughout the social sciences in qualitative research since the 1960s, the use of visual research methods in LIS has been increasing for the last ten years. As the use of these methods grows, researchers rely on methods developed outside of LIS[32] as well as examples of visual research from inside the field.[33] The growth of visual methods can be attributed to several advantages, including new insights for existing research questions, more complete, comprehensive data, flexibility to work with diverse populations, and more participatory relationships between researcher and subject that can empower participants.[34] In particular, visual methods, such as the draw-and-write technique or graphic elicitation, have been found to help researchers better understand complex and abstract phenomena, such as conceptions of information,[35] student conceptions of group work,[36] and conceptions of research by librarian and archivists,[37] as well as by graduate students and staff from university business schools.[38] In these studies, participants draw complex ideas and describe their drawings in writings, interviews, or focus groups with researchers.

Although Doucette & Hoffman have used graphic elicitation to understand librarian and archivist conceptions of research,[39] the method has had limited use in understanding how students, particularly graduate students, conceive of this complex topic. Bryan and Mavins discuss the value of drawing research in a classroom setting through their work with doctoral students and staff in the business school department who drew research or researchers in a workshop setting.[40] However, they focus less on how students perceive research. Visual research methods can provide deeper insights into research questions. Therefore, using this method to understand graduate student perceptions of research could give a much-needed understanding of how students understand research and how to best help graduate students become proficient researchers.

To date, there have been limited studies examining the graduate student conception of research itself, with prior research focusing on the performative aspects of conducting research rather than the mental models of understanding research. While studies have addressed the impact of the affective domain on the research process, they have not focused on graduate students, nor used visual methods. This paper seeks to address this gap by applying graphic

elicitation methods to a semi-structured interview protocol to examine graduate student self-conceptions of research.

Methods

The research questions for this study were:

1. How do graduate students at U.S. and Canadian institutions conceptualize research, including how they see themselves as researchers, how they perceive research is conducted, and what they consider the point of research to be?
2. What emotions or elements of the affective domain do graduate students associate with research?

Justification of Methods

In this study we used a combination of two methods of data collection: semi-structured interviews and graphic elicitation. We thematically analyzed the data to identify the major findings, using a grounded theory approach. The purpose of a grounded theory study is for a researcher to, "derive a general, abstract theory of a process, action, or interaction grounded in the view of the participants of the study."[41] We selected these methods as our research questions focused on understanding graduate student perceptions of, and experiences—both lived and affective—with research. We chose a semi-structured interview approach to provide points of comparison between research participants while also allowing for follow-up questions that could be tailored to individual participants to better explore the phenomena under study.[42]

While data collection for qualitative research is often rooted in analyzing written text, there has been a recent movement toward defining text as inhabiting a variety of visual information formats beyond written work, including drawings, videos, and artwork.[43] Graphic elicitation is a visual research method where the participant draws something and then discusses their drawing, which allows the researchers to, "see through the eyes of the participant" with a new lens.[44] Visual research methods: are beneficial for new insights into existing research questions;[45] provide more complete, comprehensive data; build more participatory relationships between researcher and subject, which can be empowering for participants;[46] and provide flexibility in working with diverse populations, representing abstract concepts like information, group work, and research.[47] Given these benefits, and following the best practice of combining qualitative methods for data validity purposes,[48] we chose to use a visual research method with semi-structured interviews to provide greater insight and participant explanation of the drawing and thoughts about research.

Recruitment, Ethics, and Informed Consent

Participants for the study were graduate students aged 18 or older enrolled in a program of study at a U.S. or Canadian institution who could communicate with the researchers in English; they were voluntarily recruited from the institutions at which the researchers worked, via email. We sent emails directly to students at the University of Waterloo from a list available to the member of the research team employed there, to enrolled students at Adler University, and to a randomly selected group of enrolled graduate students at Northern Illinois University. We scheduled participants who met the study inclusion criteria for a Zoom interview with two research team members (an interviewer who had never interacted with the participant before and a second researcher taking notes). We provided informed consent in advance of each interview and again at the beginning the interview.

During the interview, we asked participants to, "draw what research is to you" and gave them ten minutes to draw, after which we asked them to describe their drawing and any emotions associated with it. Participants provided their own drawing utensils and completed their drawings in a number of ways. Some drew digitally, others drew with a pencil and paper, and others added color. After the interviews, we asked participants to share their drawings and had the option to sign a second informed consent for using their copyrighted drawings in subsequent presentations and publications. Research participants were incentivized to participate in the study through inclusion in a drawing for one pair of Apple AirPods, which we provided at our own expense.

The study received ethics approval through the Institutional Review Board (IRB) at Northern Illinois University in the United States (Protocol # HS21-0349), through the Office of Research Ethics at the University of Waterloo in Canada (ORE # 43220), and a reciprocal agreement with Northern Illinois University by the IRB at Adler University. We recorded interviews and used these recordings to review and edit auto-transcriptions generated by Zoom for accuracy. Data were protected through a shared, encrypted folder on a Canadian-based server in compliance with the data privacy protections required by research ethics approval.

Participant Pool

The participant pool for this study consisted of nineteen self-selected graduate students who responded to recruitment emails. Nineteen participants is an appropriate number for this type of study as, "Qualitative researchers usually study a single setting or a small number of individuals or sites, using theoretical or purposeful rather than probability sampling."[49] There were eleven master's and eight doctoral participants from all campuses associated with the researchers' institutions, including online programs; therefore, students resided across the United States and Canada. The students were enrolled in programs in various fields of study, including counseling, education, psychology, engineering, public health, biology, policy administration, anthropology, and kinesiology. While the researchers did not collect demographic data about our participants outside their study area, participants were openly diverse in their race, gender, age, life experience, and citizenship. The participants were likely diverse in other ways, but we did not gather these demographic data as it was not a direct focus of the study. This size of the participant pool and diversity of experiences at the graduate level of study is representative of the later graduate student population and allows the data gathered to provide in-depth elucidation of the participant experiences.

Data Analysis

After the research team edited transcripts and verified them for accuracy, we used a thematic coding approach. This method of analysis was selected as thematic coding is appropriate for "those exploring a participant's psychological world of beliefs, constructs, identity development, and emotional experiences."[50] The use of nVivo (version 12) software allowed researchers to use the same codes reliably across coding sessions. The researchers coded the first transcript in a collaborative, synchronous meeting to establish the initial code book and subsequently coded all other transcripts in pairs. Any issues of disagreement or uncertainty were then referred to the third member of the research team for a final determination and to ensure inter-coder reliability. Where applicable, we used the drawings to complement, illustrate and thicken quotations from transcripts.[51] Once the research team coded all transcripts, we

met to group the codes into larger themes. We determined the final themes through iterative reflection, which is represented in the findings.

Researcher Positionality

Given the impact researcher identities can have on research, we need to share the context of our positionalities.[52] The members of the research team acknowledge that we present as White. Two of the researchers are cis-gendered women, and one identifies as non-binary. We are all employed professionally as librarians at the institutions from which our research participants originated. We attempted to mitigate the influence of social power structures by having a member of the research team from a different institution as the participant conduct the interview. Our identities and the potential for perceived power may have influenced what our research participants shared with us as well as what was of interest to us in probing further during follow-up questions in the interviews. Further, we acknowledge that our own experiences as graduate students in LIS and other fields influenced our understanding and presentation of the findings and helped us make meaning from our data.

Findings

Six themes emerged from a thematic analysis of the semi-structured interviews: 1. research is abstract; 2. research is an odyssey; 3. social support makes or breaks the student experience; 4. research is an emotional continuum; 5. interplay between identity and values; 6.(information is problematic.

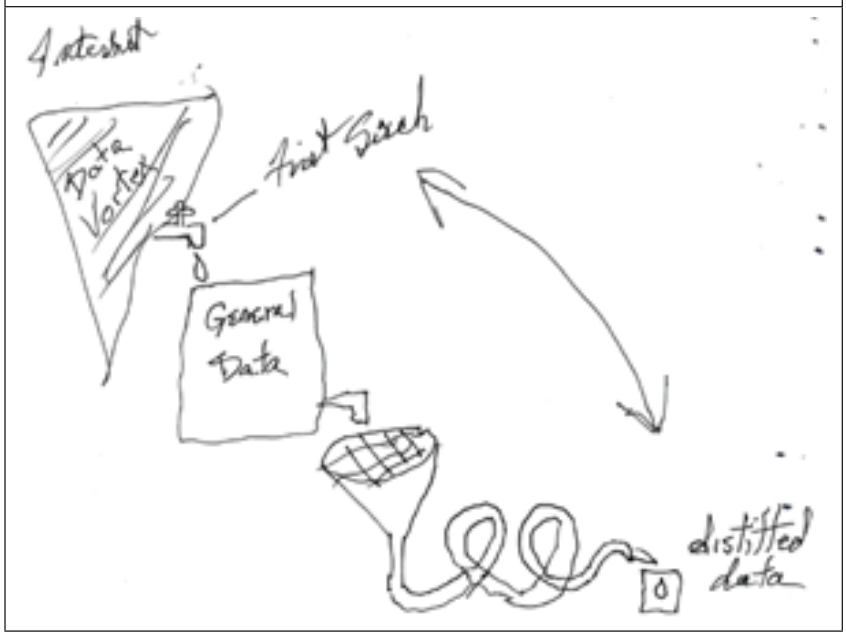
Research is Abstract

The experience of research as an abstract and hard-to-grasp phenomenon was common throughout our interviews. Students often struggled to describe what research means to them, and turned to metaphors and similes for their descriptions. Among many other metaphors, participants described research as:

- A sphere of light that sends out waves to light up other bulbs
- A rolling ball
- A series of cabinets to open
- Circles within circles
- Digging in the desert with paintbrushes
- A game of baby steps
- A path that is not always smooth
- Planting a tree that you will never sit in its shade
- Panning for gold
- A big mess I have to clean up
- Jumping off a diving board into information
- A bobsled or roller coaster
- A puzzle
- A treasure hunt

These metaphoric, or abstract descriptions also appeared in many of the drawings that participants completed. For example, one participant likened research to a funnel (figure 1), writing:

FIGURE 1
Funnels



> So, here we have the internet vortex of data. And then you do your first search, and you have general data. And then after looking that over and solidifying what you want, and then it goes through more filters and then you wind up with just the distilled data, but, when you get here, that doesn't exactly mean that you are done because from here, it can also mean that you have to go back because you found more information in the data and you have to re-refine or gather more information from it. It's cyclical, but it can go off into rabbit holes. But, it doesn't, that's not always a bad thing.[53]

At least two participants described research in relation to sight. For one, they drew a pair of muddy goggles and described how: "I truly feel like research is starts out as a big mess that I have to clean up" (figure 2). For another, they drew a pair of eyes and described research as a way of seeing the world (figure 3), writing:

> So, what research means, or is, to me is seeing. And so, eyes, and then these are people that are being seen. And then through the eyes of the researcher it's being translated into all these many more, many more either people or ideas or data.

FIGURE 2
Muddy Goggles

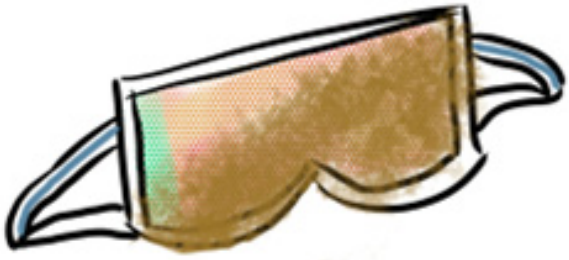
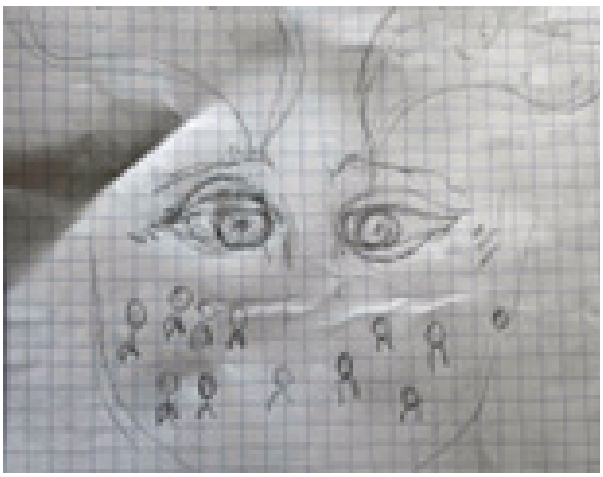


FIGURE 3
Eyes

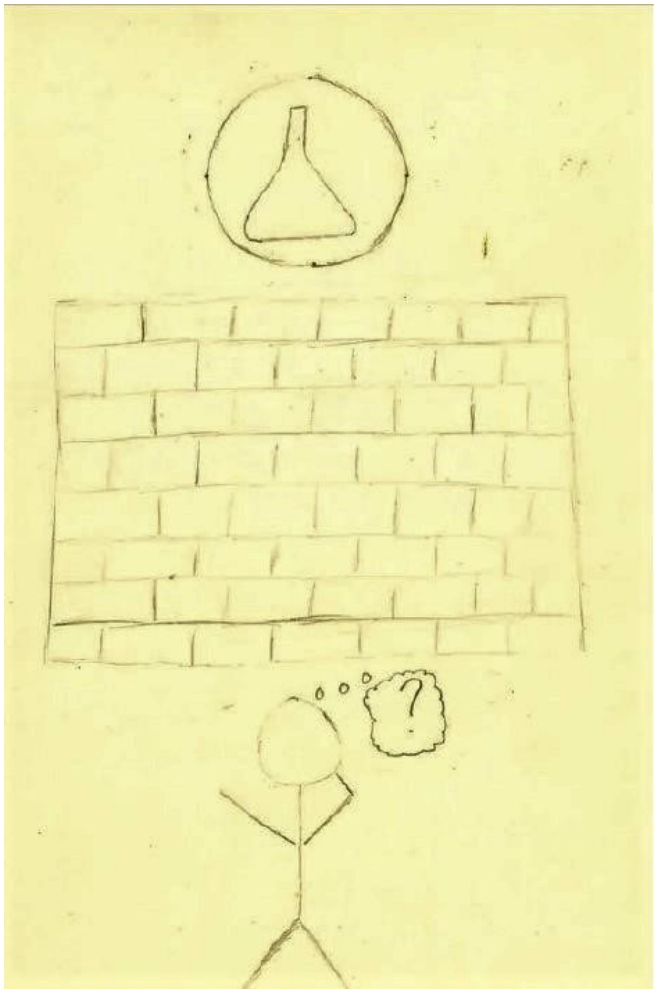


But it's sort of transmitting through the eyes. I think that's the most important feature. Translating, transmitting.

Another participant described research as a wall that they had to get past (figure 4), writing:

> there's a person at the bottom, and they're not entirely sure. They had this idea of where they want to go, but they're not entirely sure how to get there, so he's sitting there at this like wall kind of stuck…Umm, and so they have this idea of where they're supposed to go, but they can't even quite see all of what the final product could be anyway. Umm, because, despite everything you're still chasing almost like a moving target…Um, a lot of that comes from like, my experience of just being like, I'm stuck and I don't quite know where I'm going. But that's, that's like really what research is to me.

FIGURE 4
The Wall



The use of metaphors to describe research suggests the largeness of the concept. For one student, the inability to truly know what research was likened to pregnancy: "It's like being pregnant. There's no point of reference. And everything is new. Right. But after you've had a child, better prepared about what to expect." Due to the abundance of metaphors in the drawings and interviews, the researchers concluded that research is an abstract concept that is difficult to describe.

Research is an Odyssey

Within this study, participants were far from homogenous, but their experiences were simultaneously in tension between the universal and the unique. One participant shared their conception of research as follows:

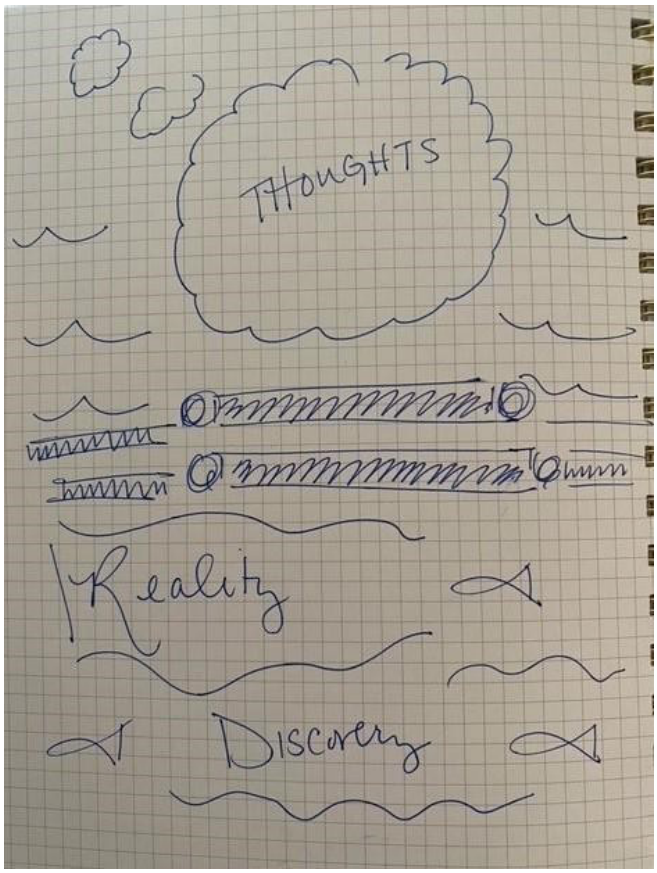
> Okay, so basically my idea of our research is that we face a mess, or any issues or whatever questions we are interest to do a little bit further investigations. So of course, there's always questions but then we have a kind of like later moment to think about maybe there are some possible solutions.

Another participant was heavily invested in the same construction of research being messy and unknown, observing:

> Because it's research like: man we don't know what we're going to find, we don't know what we're gonna solve, you know, discover, but we're going to get in the water. [tone becoming more excited here] And see, and that's the research basis part, and where you make these discoveries where you figure out what's real, right? You take those thoughts that you had in your mind, and you bring them down into a space where you're going to, sort of, like, find things that are new so that was an interesting question.

This same participant carried the metaphor of jumping into the water further in their drawing of the research experience, sharing that research is a bridge between two big ideas (figure 5). The surrounding dark waters are characterized by the reality of doing the work and the potential for discovery as an eventual outcome.

FIGURE 5
The Bridge



Participants' descriptions were unique, yet these overall conceptions of research were shared universally. Participants held this same tension between their unique experiences and the universal when considering how they performed research or engaged with the research process. One student noted: "So, in the beginning it was really just, you know, trial and error, I'm looking for these things out there." A second participant expanded on this concept of trial and error describing their experience with research as, "Once you go about doing it and you start trying to do it and keep realizing, things aren't working and you have to like continually go back to the drawing board and figure out something."

These conceptualizations strongly mirrored classic stories, like the Odyssey, in which an individual goes on a long and harrowing journey and the expectations of the journey are not always met. Further, the experience of graduate-level research is both liminal, that is, constantly existing between two states or places of being, as well as a recursive process. One participant expressed this experience eloquently, stating:

> So I think it increases the comfort that like it's all going to work out. if you, if you think of it as this kind of like: these are the steps that I have to take. But I also feel like it doesn't help anybody to ignore the realities of, you're gonna have to

> go back, you know, it's not going to work out in that linear process. I feel like the linear process is a place to start when talking about research.

FIGURE 6
Mountain

Another participant described their approach to working within liminal spaces noting, "But the biggest thing that I've learned is to just set in it, set in the confusion for a minute and just, let it marinate and sit. And the more you're able to look a things objectively, or, well, yeah, objectively, the clearer the path will become for me." A third participant continued to grapple with the in-between experience of research stating, "You know, that's a struggle with, with research in general is they don't tell you what's enough. You know like no one, no one tells you like, this is good enough, or like, this is where it should be." This concept of the journey also appeared in participant drawings, including one where the participant had to take a pause for family reasons, exemplified by the tent, part way through their academic program (figure 6). The onslaught of research always threatens to create an avalanche that can impede or throw off the journey, but reaching the summit is a rewarding and compelling outcome.

Ultimately, many participants expressed value in the journey and the learning that resulted. Expressing this value, one student shared, "And, but by the time the end of it you have this incredible bond that you build you have done this thing you made these discoveries and you have a remarkable story to tell."

Social Support Makes or Breaks the Student Experience

A common theme in our interviews and our participant's drawings of research was the importance of social support to research. Participants discussed the importance of social support, often mentioning the value of supervisors, fellow graduate students, and others as instrumental in their progression and success.

Participants described how the support or lack of support from a supervisor could enhance a student's experience or make it impossible for them to succeed. One participant shared:

> Whenever I'm doing research and I have to send it back to the supervisor real quickly and be like: Hey, what do I add here? Is this full? Do you think this is, am I applying theory the right way? And then she would comment back and gives me great feedback, it might take time but it still gets back to me, which is great. Versus other students where their supervisor sometimes like, I don't know, you work it out, you're the student. It's like, woah. But I'm learning from you, technically. Or even simple things like maybe she reminds us, "Apply for the scholarship. Do this. I'll give you a reference dah, dah, dah." I've heard of students… Um, that

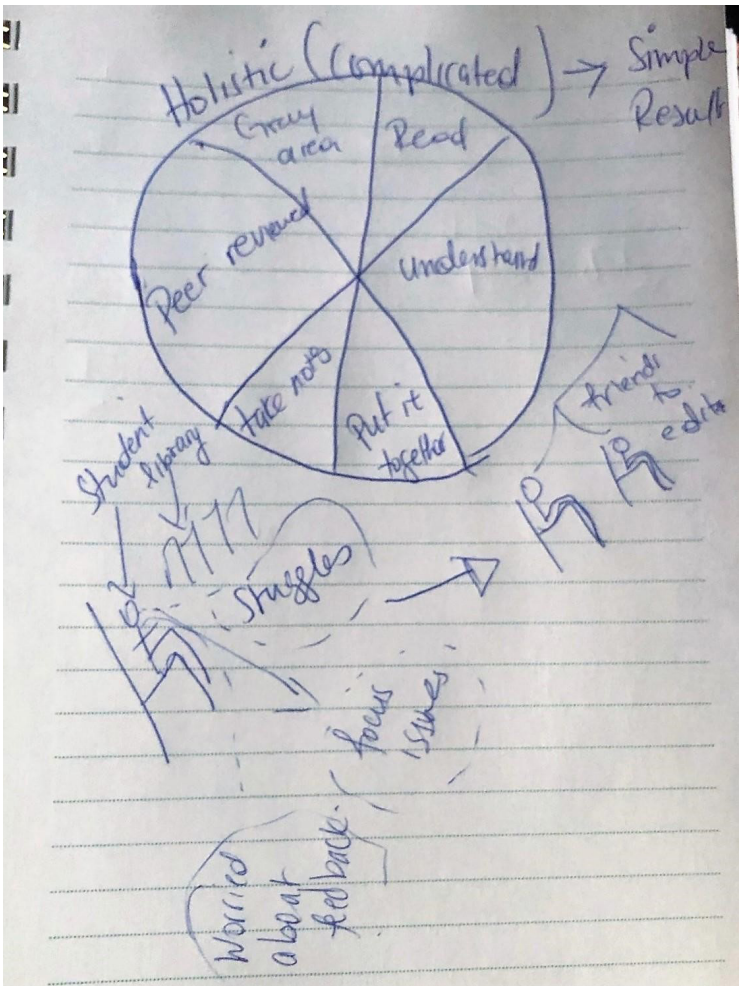
> one supervisor told the other student, her own student, that she's not going to give a reference to it because they've been working online and she doesn't know the student well. But it's like, one of the requirements of that scholarship is the supervisor gives you reference. Second, it's the time of COVID and we are working online. So it's just like that. How is that even acceptable? Um, so they could be examples of how can one succeed in this whole role versus how can one not succeed.

This quote exemplifies how the supervisor provided feedback and guided the research process, which supported the student in applying for scholarships. At the same time, the participant recognized the value of this relationship as they compared it to peers who were held back by supervisors who refused to support scholarships.

It was not just supervisors that participants mentioned. Many participants also discussed the importance of their fellow graduate students as supports throughout the research process. One participant shared:

> And the research that I do wouldn't be the research that I'm doing without my collaborators. I, you know, I spent a lot of time alone doing statistical analysis but even that isn't completely solitary because I'm constantly asking for help and feedback and new ideas and, you know, even the research part—that's like the part where you're reading before you start a project, I don't view is entirely solitary because you're building on the ideas that other people had. And if you're lucky some of those people are still alive and willing to talk to you. [laughs]

FIGURE 7
Social Support



One participant included their colleagues in their drawing of research, describing this aspect of their drawing as "a couple of students sitting on the other side of things called friends who are going to edit this work" (figure 7).

Some participants also shared positive interactions with librarians, primarily in reference situations, as supportive to their process. However, it was rarely a focus of their discussions unless they were specifically referring to the literature review. One participant stated:

> Even when I…read studies and things like that for papers I feel a little like I don't know if I'm doing this right…. I had a meeting with [a librarian] and it just really, really helped kind of organize this is how you do it…. And then I did find all these articles and then even that again [the librarian] was like okay now don't read all of them or don't read two of them and forget the rest because you don't have time, sort of that process of get this layer first get the abstracts, and understand what's happening there…. It was helpful. It's almost like the structure became visible to me and it never was visible, before.

One participant bemoaned the diminished opportunities to talk to other graduate students due to the pandemic, stating:

> So, I haven't had the chance to talk to participants, or you know collect data, and then also because of Covid, I haven't had a chance to socialize with other graduate students, which I think, by the way, is the most, one of the most valuable things as a research graduate students, right, being around other graduate students who are also struggling to run their studies. You know, it just helps to know that you're not alone.

Lastly, participants described the importance of other people in their life outside of academia supporting their research. For example, one participant described the value of family support during their research as follows:

> And also it's, I find that it's important for my son to see me invested in my work. And, and when he's older I guess explain to him like this is what I had to do during that time… like I have support, like I'm lucky I have support I wouldn't say it's like for everybody.

Overall, graduate students described many examples of how their social support networks either helped or hindered their progress in research.

Research is an Emotional Continuum

The first question the researchers asked participants was: "what kinds of emotions are associated with research in your drawing?" One student responded, "it's just a huge [sigh] collection of emotions." Many participants in this study repeated the sense that research involves different emotions.

Students described negative emotions at the beginning of the research process, which they often attributed to being overwhelmed by the number of sources to read and evaluate for their literature reviews. One student asserted, "it's scary because it's unknown." Others

felt overwhelmed by learning to balance uncertainty with a desire to read everything; as one student explained, "it's not always easy to feel like you don't know all of the literature and I have to remind myself that's not possible." Here, the student knew they were not expected to, nor could they, read all the literature, but they wrestled with recognizing saturation. Another student struggled with not having enough time:

> You know, because you don't have…a lot of time, you know, to kind of narrow your focus and, you know, I mean journal articles and research studies are not short, and they're not necessarily easy to read, especially when you're new, you know, to this type of research and writing.

Another student said that, beyond a lack of time, the graduate experience of research contains more uncertainty than undergraduate research, which increases anxiety. They explained:

> But when you go to graduate school, you realize that there's so many unknowns, and there's no definite answer…and they [the committee] would ask you questions about research that…it's not well established or not well known or it's a knowledge gap and then you're trying to address this, and you're not quite sure, because you have not read all of the literature [sweeping gesture with hands out and around] that exists, right? So I would never feel like I'm as confident as I was an undergrad where it's like you have those readings, you read them, and then they test you on those readings.

This quote indicates essential differences in the research experience between undergraduates and graduate students. Graduate students are expected to find current gaps and create new knowledge, rather than summarizing texts from others.

Even after completing the literature review, participants continued to lack confidence, leading to emotions of fear and frustration. One student, referring to their research experiment stated, "and so there's I think that fear part of me is like, I'm not going to do this right." Another participant explained:

> I think that no one's comfortable with the idea that their experiments aren't going to work, or that they're not going to find something that is worth disseminating. I think that's like the scariest thing to a graduate researcher, thinking like, 'Oh my gosh, what if I don't find something.'

Several participants echoed this fear that even if the research is designed well, they still might not find relevant results.

These negative emotions were often intertwined with positive emotions for the participants, creating tension between perseverance and procrastination. One student articulated:

> Oh, I thought this method will work or this model will work, but in reality, when we start really doing something then I need to change. So I guess it's kind of like half of it is exciting and the other half is uncertainties.

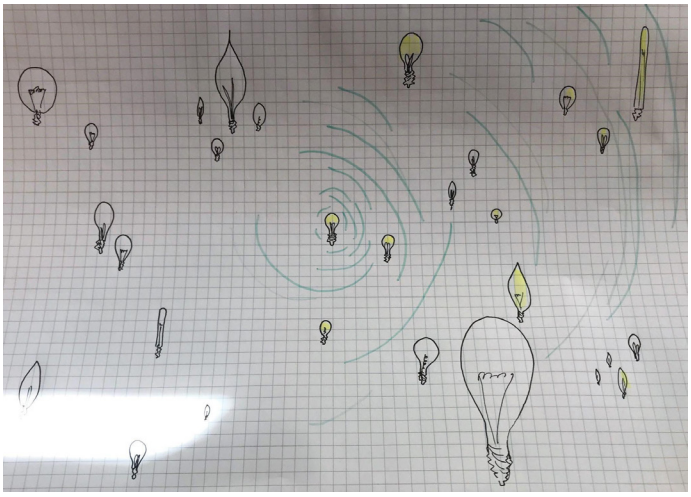
Some participants found the beginning of the process more frustrating, whereas they later felt more excitement, particularly after a success. One participant said: "finishing things like this gives me, you know, that sense of accomplishment, you know, it's one step, one thing. So it's both good and bad feeling I suppose." Here the student highlighted their sense of accomplishment, but also the frustration that this positive emotion was just for one small task within the larger scope of their research.

Several students said research connected them to something beyond themselves. One participant shared that their passion for research allowed them to become immersed in the flow, saying:

> And I know with me myself and I, the three of us can become extremely—engaged doesn't even cover…—what is the word I'm looking for, so 'immensed', so part of the process that hours can literally fly by. It's almost as bad as Facebook. So I am so drawn in and captivated by what I'm doing that, everything else is out, it doesn't even dawn on me [hands move in the air around their head, like ideas floating past the head]. I have to set an alarm to make dinner, because I get all wrapped up in what I'm doing. And when a portion is completed, whether that's chapter, whether that's survey item, whether that's looking for a coefficient value, whatever it is, I just feel so delighted with me. [laughs] and I feel achieved, so there's you know, a sense of 'all right Me! You go Me!'

Other participants appreciated how research connected them to others. One drew lightbulbs of different shapes and sizes, depicting which resources impact others (figure 8). They explained that research gives them a "feeling of connectedness and understanding…I do feel like I'm actually connecting in some sense with the authors of the papers that I read."

FIGURE 8
Lightbulbs



However, even amid their excitement, most participants still returned to feelings of overwhelm. One participant shared:

> I often get overwhelmed by the idea of all these things that I have to do… on the one hand, it's very, very overwhelming to think about all the, all the details, because there's so many of them, you know, there's research just requires so much little pieces of effort, and all those little pieces of effort, you know, have to be, you know, then eventually coalesced into your, your research project. But year, then on the other hand, I find research very fulfilling, and so, I think that's the other side of it is, is the sort of accomplishment feeling.

In the quote above, the participant expressed the tension between emotions amid the overwhelm. Another student similarly explained the overwhelming and conflicting emotions of research, stating:

> there's a lot of this idea of like, continuously moving forward even if moving forward seems like a step backwards in some cases. So like yes, I did figure, I did figure out how to like track all these particles. But oh no, tracking all those particles in the way I was doing it wasn't particularly useful. How do I go back and actually put this into a usable format? And it's like, okay well now I've got all this. It's like, wait a minute some numbers aren't making sense. Why aren't they making sense? Oh, that's because actually didn't want these things wrong and I need to go back and start looking at it again. And now that I have the output in the form that I want it, now I can watch them change as I'm making these very small changes to how I'm looking for certain angles and certain characteristics.

Feeling various emotions was a common theme throughout the interviews with graduate student participants. They expressed a mix of positive and negative emotions, as well as a sense of discord between their various emotions.

Interplay between Identity/Values

Participants pursued research for a variety of reasons, many firmly connected to their identity, such as inherent personality traits, an interest in knowledge itself, a desire to improve the world, and personal career goals. Many participants noted that it was their personality that drew them to research, or that enhanced their enjoyment. Several focused on their innate curiosity, such as one participant who stated, "I have this avid curiosity. So, I would describe myself, like my thoughts around research, as hopelessly in love with it." Similarly, another participant believed their inquisitiveness has always made them a researcher, stating, "if I were to think about it now, I think I became a person who was always going to be a researcher, very young. I think that folks who have that inherent curiosity, they kind of have the spirit of the researcher… I think what… unites researchers is a drive to find things out." Some specifically mentioned enjoying challenges and bringing this into their research, such as the participant who shared: "as I progressed, I was like, I felt I was slowly getting to my end goal, but it was definitely not a smooth journey and I didn't expect it to be smooth because I did do my master's, so I knew what research entails, and if anything, I enjoy challenges. And if it were to be smooth, I don't think I would… be drawn to research."

However, others felt that their personality or life experiences decreased their aptitude for research. One participant suffered the death of a loved one during their dissertation, which they described as impacting both their mental health and research, sharing, "my own mental illness and my own loss that made my ability greatly diminished, you know, I don't think I'm the researcher I was two years ago. Instead of getting better with experience, I think… my own problems have made me kind of worse at it. I guess because of these, you know, fears and difficulties with it, right, so you're like, you've got to put yourself out there and things like that, and that's incredibly difficult." Another student recounted their frustration with the lack of rewards or recognition for their work which they expected, stating, "I would work very long hours, and there's nobody who's like, 'oh wow you've been doing so many hours, like that's

amazing.' Like, your work ethic is kind of like expected, as opposed to if I was working in the industry and I was investing this much time and effort, I would be rewarded at a much greater rate." This student decided they did not want to continue in academia but would instead go into industry after graduation.

FIGURE 9
Finding a Career

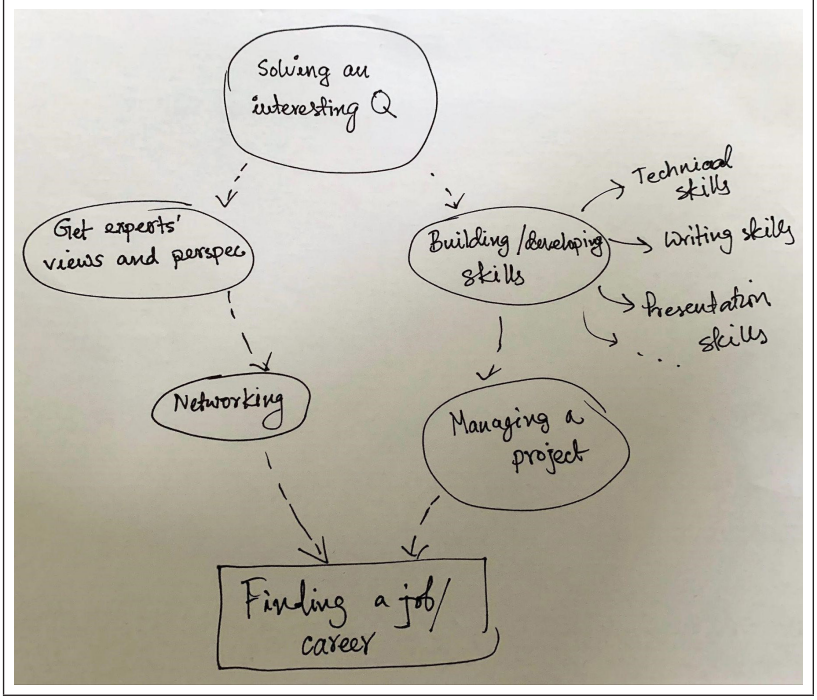


Figure 9 depicts multiple values, including investing in a career. This participant shared, "I tried to shape my research more like that would be helpful for me, for future, like when I graduated. I can use my research, and the skills again from my research to find the job I want." Another participant focused on obtaining a degree when asked why they research. These profoundly personal rationales impacted how students reacted to pitfalls or detours in the research process.

Several students discussed the importance of the impact of their research, which they linked to their values. They valued this knowledge for themselves or for the sake of the world. One participant said, "I think I'm coming to the conclusion that it ultimately, me doing this is as much to enlighten myself as it is to fix the world around me." This participant had drawn partially muddy goggles (figure 2), which they explained showed the chipping away at ignorance. Another student stated:

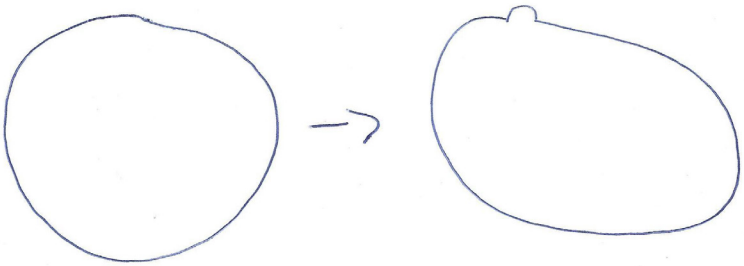
> and when I say learning, that's also including the research, because when I'm doing the research, I'm also learning about. And it isn't, you know, I may be making it sound glib. But it isn't. It's also the reason why I get jazzed about what I'm studying because information is good. Knowledge is good. Science is good.

This quote exemplifies the connection between the value of information and the interest in research. One student who had given birth during their dissertation process reflected on how their struggles with research would impact their son, sharing, "I find it's important for my son to see me invested in my work."

Some participants were motivated by broader aspirations of their research shaping the scientific community or the world, such as the participant who wrote: "one of the things that… was very powerful and meaningful to me was the idea of finally getting to be a part of like this, scientific community intent on bettering, like humanity as a whole, and not just being someone doing something on their own. It's the idea that everything we do is for people." This quote exemplifies what others also expressed: the desire to be part of something larger.

Several students noted that their research might play only a minimal part: "if you can see circles within circles, then you're… at least cognizant… that you're… a speck, you're a spec of reality." Another also spoke about, and drew, research in terms of circles (figure 10), saying, "but if you take into account the millions upon millions of people doing research right now. Each tiny blip that they had increases the circumference of this circle, which is all the combined knowledge that we have up to this moment." So, despite the small potential impact of any particular study, students still believed that research would "positively impact our society. And, you know, help us move forward." For many graduate students, the connection between their identities and their research was closely tied.

FIGURE 10
Circles



Information is Problematic

Throughout the interviews, participants expressed an awareness of the idea that information itself is problematic. Participants expressed that finding the information you want or need is not a clear-cut experience and requires an openness to exploration.

Some participants expressed this difficulty with information seeking and use as a major aspect of their drawing. In both figures 11 and 12, the participants identify information gathering as a critical component of generating ideas, as well as exploring ways of examining and understanding the experiences of others within their research. Figure 11 identifies journal databases as a key component of research, and figure 12 shows a diagram of how library/resources help point to an idea. The participants also discussed this concept at some length during the interviews. Representing the feelings of many, one participant captured this idea well by sharing,

FIGURE 11
Information Gathering

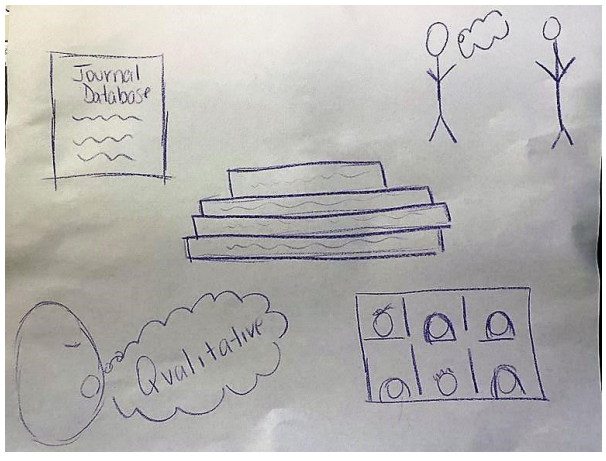
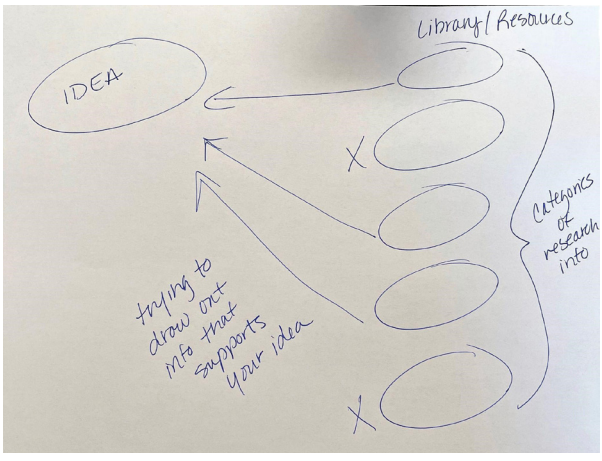


FIGURE 12
Information Gathering



> I feel like when you're doing research that each step of the research along the way is connected to the previous things like if I have a research question. Then I go in with, with a certain formulation of it but then as I explore conflicts in the literature space. It's like the question often changes and, and morphs into a related but slightly different question. It's quite associative? Yeah, yeah so it ends up forming a network like, like a neural net or something like that.

These conflicts within the existing information could change the way an individual approached their work, exemplified by a participant who shared, "It expands and sometimes shifts. Yeah. So, as you kind of like, illuminate more of the research puzzle. You end up either broadening or narrowing your question, depending on what you find."

While the problematic nature of information could be felt in how it shaped and reshaped the overall research process, it also led to significant questions about validity, trustworthiness, and saturation. Participants grappled with how to know if they had found enough information, the right information, or the best information. A participant succinctly captured these tensions observing, "But there's also ones where you look at the article and you go, okay, I am not skilled enough to determine the validity of this yet, or, I don't have a sense of the field and to know who was in the field and who's looked at this and like how." The participant further shared that they attempted to use citation count as a proxy for information quality, saying, "I guess I could say that I've started to kind of pick up on like, oh, they've been cited a lot in a paper and Google Scholar is good for that, like, you know, you see whose side of what, how many times it's been cited, all that kind of stuff ." The participant went on to explain that they worked strategically over time to overcome this issue, saying, "I would say that I pretty consistently worked over the course of that stretch of months to get to that point where it's like, oh okay I'm kind of getting this. But it still feels like I'm having trouble determining validity versus, you know, public acceptance." These interconnected thoughts from one participant were indicative of observations and approaches shared by several others who attempted to develop or employ strategies to determine the validity or value of the research upon which they planned to base their original work upon.

Beyond approaches used to navigate and assess validity in published information, participants also grappled with how their approaches to original research could result in problematic information. One participant, working on survey-based research, opined,

> I feel like to truly gain somebody's trust in a way that they are going to even answer survey questions totally honestly and from a frame of mind where they're trying to be unbiased with their own experiences, umm is really difficult. And, you know, like, you want to start asking people about their own trauma, like everyone finds their own way to process and deal with their trauma, and a lot of that is not completely true to what actually happened.

Another shared that they were fascinated by why certain things might be missing from the existing body of literature, saying,

> I mean the temperature in your room effects to what your kids learn like and why isn't that part of the conversation? Or, or the humidity in your room can affect

> what your kids are learning, or, you know, the exposure to light the amount of windows or the quantity, the air quality, like all that stuff is very, very pertinent but, somehow, like you, know early theorists skipped over it because they had bigger ideas or whatever else. Who, knows? You know?

For this participant, the missing information in a study was concerning. Whereas another participant felt that researchers were aware of the limitations of their work, but that the general public pushed for the information gleaned from studies to be less complex and more generalizable than it actually is, explaining:

> And I feel like research scientists take that and we'll publish. You know, this is what we found, this does not mean that this is applicable to anybody else in any other context. That we're not saying that this is how humans work. This is just what we found under the specific sets of circumstances and there's always, you know, that section: opportunities for future research. You know, like I think social scientist researchers [emphasis on researchers] are really good about understanding the limits, but human beings are not. And so you have things that people pick up from data sets without really looking at the limitations or understanding the data well.

For many graduate students in this study, dealing with the information in research created challenges for understanding, organizing, and working with that information.

Discussion

Models of Research

Existing theories of information-seeking behavior do not fully apply to the experience of graduate students in this study. While there is a strong emotional component for graduate students and other populations studied, both Kuhlthau's Information Search Process[54] and Dervin's Sense-Making Theory[55] indicate that individuals feel a level of affective relief and increased certainty or motivation in their research tasks. For the participants in this study, heightened emotions and a sense of uncertainty or imposter syndrome persisted throughout their experiences. This distinction may be related to the graduate student experience particularly or it may be indicative of the difference between research activities aimed at creating new knowledge rather than those focused on synthesizing existing knowledge.

The cultural-historical activity theory,[56] which, to-date, has primarily been used to investigate workplace information use and human computer interaction, is potentially a better fit for explaining the research experiences of graduate students because it intentionally incorporates a social dimension to the experience of learning and communicating. Within the experiences articulated in this study of graduate students, participants routinely mentioned social supports, as well as opportunities to interact with supervisors and peers, as critical for their persistence or success. This theory fails, however, to address the affective dimension more fully realized in the Information Search Process or Sense-Making Theories. Taken as a whole, these findings indicate a single existing theory of information behavior is unlikely to explain the complex, varied, emotionally tenuous, and socially-informed research experiences of graduate students.

Research is Complex

Research at the graduate level is fraught with overwhelming complexity. Graduate students communicated this complexity via their metaphors and drawings of research, and in their stories about research. Conceptual Metaphor Theory suggests that the metaphors students used in their drawings and descriptions of research are not just linguistic devices, but a way of making and expressing meaning for complex phenomena.[57] In choosing to use metaphors to describe research, graduate students struggled with the amorphous nature of research. The sheer size of research at the graduate level often resulted in expressions of overwhelm. Existing studies discuss the emotional components of research,[58] but what was interesting for the graduate students in our interviews was the simultaneous emotional tension between positive and negative emotions throughout the research process.

The stories that graduate students shared about their research were also complex and filled with challenges that often-mirrored great classical journeys like the Odyssey. Despite interviewing graduate students from different disciplines, and at different stages throughout their research process, the similarity in their journeys suggests there is a strong commonality to conducting research at the graduate level. This finding stands in contrast to existing LIS research focused on the literature review aspects of the research process in which disciplinary conventions and differences were distinct.[59] Considering the graduate research experience as a broader journey necessitates the examination of the many barriers that graduate students experience. One of these challenges involves information: finding, making sense of, organizing, and using information. Other research has looked at some of the challenges that graduate students experience related to information;[60] however, what is interesting for librarians from this study is that few students discussed issues with using a database or knowing where to click. Instead, graduate students discussed challenges like knowing when to stop gathering information, how to know which information is essential, or how to know when a topic is too narrow or too broad. Existing research has explored some of these challenges. Moore and Singley highlight that students follow threads of information, no matter how far away it takes them from their original topic of study.[61] Barrett identifies the constant searching for information as a continuous "digging" cycle.[62] This study suggests that surfacing and explicitly addressing the emotional challenges of the research process, as well as information discovery and use, is a critical element for student success that supersedes disciplinary considerations.

Research is Personal

The interviews in this study suggest that research is both intra- and inter-personal for graduate students. Previous literature supports the connection of identity to research.[63] The participants in this study also indicated that their personal identities guide and motivate their research interests. Some linked their values to the impact they hoped their research would have. Those values and impacts included personal enlightenment, improvement of society, and access to specific careers. Students indicated that their dispositions moderate their resiliency to the inevitable complexities encountered during their research process. For example, some mentioned relishing challenges or being innately curious as being protective factors against wavering/failure. However, one participant described how their grief and mental illness undermined their resiliency.

Our findings also show that interpersonal social support influences graduate student research experiences, corroborating past literature.[64] For example, Frick and Pyhältö reported

that, in their quantitative study of doctoral students in Finland and South Africa, some of the most prominent positive and negative experiences revolved around supervisor encouragement and, conversely, lack of supervisor support.[65] Participants in this study also indicated that supervisor encouragement and commitment to the relationship created positive experiences for the students. One interviewee mentioned that their chair suggested scholarship opportunities and provided helpful feedback on their work. Their experience suggests a discrepancy in how effective different chairs are at mentoring graduate students, which raises some interesting questions for faculty working with graduate students.

Additionally, students mentioned the importance of connecting with peers to normalize the emotional journey of research and improve their skills. Could more opportunities for graduate student socialization be provided? Is there a way to create more collaboration between peers on research? The physical isolation of the Covid-19 pandemic may have mitigated the social support students in this study received, as interviews were conducted in the summer and fall of 2021. Future studies should review the impact of the current work-from-home culture on graduate student sense of support.

Implications for Practice

The findings of this study show a need for librarians working with graduate student research to decenter the database, to join students on their journey using an affective lens, and to emphasize pedagogy that increases connection and social support across disciplines. Although participants knew they were talking with librarians, they did not discuss database struggles. Instead, they discussed challenges around biases in information, knowing when they had enough, how to deal with too many relevant results, and refining topics. Graduate student research experiences show the need to decenter database demonstrations in information literacy instruction. By this, we mean focusing classroom time on the examination of deeper information contexts and problems, while intentionally moving away from a primary focus on demonstrating database interfaces and features. This pedagogical shift provides more time for deeper grappling with information in instruction and reference appointments while better aligning with the ACRL Framework for Information Literacy.[66]

This study reveals that students experience many emotions, including continuous overwhelm, throughout the research process. This sense of overwhelm can impede their ability to progress. The more reference and instruction librarians are involved in research themselves, the better they will be able to personally connect to the student's emotional journey while also helping students understand how the literature review relates to the rest of the research process. In instruction sessions and reference appointments, librarians can normalize emotions and illuminate a path through the research process so students can move forward despite being overwhelmed.

Participant discussions indicate that graduate student research journeys transcend disciplinary boundaries when considering the research process holistically. Therefore, librarians can consider various models beyond the classroom or reference-based interventions, including co-curricular workshops, asynchronous learning objects, and interdisciplinary orientation sessions. These approaches may be most student-centered when designed in collaboration with others who can bolster social support at other points of the research process beyond the literature review.

Limitations

This study was subject to several limitations. First, as with studies of this nature generally,[67] the participants self-selected, which likely resulted in a participant pool of students who are more interested in, and engaged with, research than might be typical of those in graduate school as a whole. Because of the self-selection, the participants were also not representative of all potential areas of study. This limitation, however, is somewhat balanced by the finding that research experiences had consistent common elements across all participants. Second, the participants were drawn from only three institutions, all of which are situated within the North American higher education context. These limitations are consistent with those routinely found in qualitative research, which often includes participants from only a single data collection site and a specific geographic region.[68]

Finally, validating interpretations of subjective data, such as drawings, presents challenges when using a visual research method like graphic elicitation.[69] A few participants commented throughout the interviews that they might change their drawing, which suggests that drawings cannot represent a complete understanding of a large concept like research, and echoes existing findings that interviewees refine and clarify their thinking during the interview process.[70] These limitations are partly why we used visual methods in combination with the second method of semi-structured interviews, so that the images could be connected to the participants' discussion to guide interpretation.

Conclusion

This paper explores graduate students' holistic conception of research. Grounding the study in graphic elicitation provided a key to accessing participant affect, allowing the interviewees to delve beyond their immediate reactions,[71] particularly given the complexity and amorphous nature of research. Although the findings of the emotional aspects of research are not entirely unfamiliar within the field of library science, the contribution here exists in how the graduate experience of research differs in the magnitude of uncertainty throughout the research process.

The interviews show that graduate students' internal values and motivations were protective factors, providing perseverance to complete the research. Similar to prior research,[72] the qualitative data point to the prominence that constructive relationships (supervisors, classmates, community/family, and librarians) empowered graduate students. When asked about research, graduate students in this study, unlike other populations,[73] were less concerned with search experiences but rather with the complexities of information itself, as well as the challenges inherent in navigating unchartered, amorphous processes. Additionally, as seen in this study and supported by Frick and Pyhältö,[74] graduate student research experiences are not bounded by a particular field of study.

These findings imply that graduate students have an experience of research distinct from other populations. This difference suggests that librarians who help graduate students with their research should focus less on teaching database navigation. Instead, librarians need to acknowledge the complexity of the entire research process, take time to help the student process where they are on the journey, and validate the inevitable emotions involved with that experience. Librarians should also provide structure to graduate students so they have at least a sense of how to build a map of their research journey. Additionally, if librarians bring themselves fully into interactions with graduate students, they may serve as empowering social support. The help provided by librarians will, therefore, in part, need to transcend disciplinary boundaries.

Future studies will benefit from incorporating a similar methodology as different ways of thinking about information may help the participants to think more holistically and deeply. Longitudinal studies are needed to study graduate students' conceptions of research as they move through their programs; this would be particularly salient during the dissertation process. Further, while this study did not collect data on participant identity, participants still mentioned how their identities shaped their research. Future studies could consider the connection of participant positionality to graduate student research.

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Finally, the authors note that the researchers in this study contributed to the project equally at all points during the process. Authorship order was determined by a collaborative conversation within the team and reflects the order in which each author joined the study.

Appendix A: Interview Questions

1. Please draw what research is to you. You will have up to ten minutes to draw and then we'll ask to see the drawing and to have you tell us about it. If you're ready to discuss sooner, please let us know.
2. Please share your drawing.
3. What kinds of emotions are associated with research in your drawing?
4. How do you see yourself as a researcher?
5. Tell me about your most recent experience with research.
6. Why do you do research? OR What do you hope to achieve by engaging in research?
7. Last question: Is there anything else you would like to share today?

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Moving Beyond "…of its time": Statements on Harmful Content and Descriptions in Library and Archival Collections

Alexandra Kohn and Dawn McKinnon

Many libraries and archives have recently released statements about harmful material in their collections and the descriptions of these collections. However, these types of statements are not required for any professional accreditation or membership, nor are there specific guidelines to follow. This study collected and analyzed statements from members of ARL (Association of Research Libraries) and CARL (Canadian Association of Research Libraries), measuring their prevalence and identifying common elements. The findings and discussion can be used as a resource by those hoping to create or amend a statement, and for the larger library community to take stock on this topic.

Introduction / Background

The vast collections within libraries and archives tell many stories—stories within the items collected, stories about those who collected, arranged and described those collections, as well as information about the time period in which both existed—and allow us to reflect on the time we live in now. Collections also shine a bright light on who and what is missing and misrepresented, both in the past and today. Many institutions are reckoning with materials in their collections, particularly how and why they were acquired and described, and are starting to acknowledge their subjective place in the social and cultural systems that shape these collections. One method institutions employ is writing statements on institutional websites, catalogs, records, archival descriptive notes, finding aid notes and digitized and born-digital content. For example, the University of Waterloo's Special Collections & Archives decided to move beyond blanket, single-sentence statements about "historical" content and language, which are often euphemisms for racist, sexist, exclusionary and many other types of harm. They decided instead to hold themselves accountable and to implement change, even without having all the answers; they released an expanded statement about harm found within the language of their archival descriptions.[1] Acknowledging harm can start to alter the story of the collection. When an institution acknowledges the problematic language in its descriptions or the materials in its collection, it begins to show the community that it is aware of its complicity and no longer willing to ignore its role. It is only then that libraries and archives can begin to

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move forward alongside all the patrons they serve. Many other libraries and archives have completed similar exercises, as documented by Cataloging Lab's "List of statements on bias in library and archives description."[2] This list is continuously updated. The statements in this list focus primarily on cataloging and description, such as University of Southern California Libraries' Statement on Anti-Racist Description.[3] However, many other institutions have released statements referring to the harmful material held within the text and imagery of collections, including Indiana University's Digital Collections' Harmful Language Statement.[4] These types of statements are not required for any kind of accreditation or membership, nor are there specific guidelines to follow. Statements are ad-hoc in nature and sometimes difficult to find. This study aims to inspire and help academic librarians and archivists in North America (and perhaps elsewhere) to take stock, to learn about what these statements contain and to discover their prevalence. In this study, all types of "statements'' from Canadian Association of Research Libraries (CARL) and Association of Research Libraries (ARL) members were investigated, from single-sentence blanket statements about "historical language" to multi-page websites. This study investigates the following research questions:

1. What proportion of ARL and CARL member libraries have harmful language and/or content warnings?
2. Are the statements about cataloging and archival description or are they about the contents of the collections (text, speech, images, items)?
3. Are there trends and commonalities amongst the statements?

Results of this study can be used as a resource to create or amend a statement, in addition to starting a conversation about best practices and the creation of guidelines in this area within the larger library community.

For the purposes of this study, "language" refers to terms in the cataloging and archival description, whereas language that constitutes part of the item (e.g., racist language in a piece of correspondence included in an archival fonds) falls under the category of "collections and content." The authors acknowledge their own bias and privilege as white cisgender women who work in a large, research-intensive academic library.

Literature Review

Librarian and archival practice has traditionally been portrayed and self-represented as neutral and free from political entanglements.[5] It coalesces around the foundational myths that collections objectively reflect the recordkeeping practices of their creators, and that material is simply being exposed.[6] There is an ever-growing body of literature that shines a light on the ways in which every aspect of librarians' and archivists' practices, from appraisal to description, is permeated and shaped by bias, affecting what is collected and how it is showcased.[7] A profession long-dominated by white people,[8] alongside Christian, heterosexual norms[9] has resulted in language and practices that are exclusionary, racist, sexist, and "fraught with violence and othering."[10] While librarians and archivists work, "within and against these linguistic structures," building and extending them, and teaching patrons how to use them,[11] some information professionals are starting to acknowledge and learn more about underrepresented and unheard voices, these "silences and erasures in our archives."[12] This involves investigating ourselves with new and inclusive perspectives, and altering language that has been in place for decades. Some efforts are at the grassroots, individual level. For example, Ramirez points out that "whiteness" has several euphemisms amongst our collec-

tions and their descriptions, including "tradition," "neutrality," and "objectivity." This small example may seem subtle or banal to some but is glaringly exclusionary to others and needs to be examined. He states that having honest discussions about how the library and archives communities perpetuate inequality can be liberating, allowing for a freedom to start "the real work of documenting history."[13]

Other efforts are occurring on a larger scale, such as librarian and archivist responses and recommendations related to the Truth and Reconciliation Commission of Canada: Calls to Action.[14] For example, the framework developed by the Steering Committee on Canada's Archives aims to identify how archives in Canada can move toward reconciliation and decolonization of practice[15] and the Canadian Federation of Library Associations-Fédération canadienne des associations de bibliothèques (CFLA-FCAB) aims to highlight best practices in place across Canada and foster greater cooperation at the federal level.[16] Both grassroots and large-scale efforts are critical for systemic changes to take place.

Some discussions about change in this area revolve around one major component of description: subject headings in library collections. These have been debated, examined and critiqued for decades, for their inherent bias and harm, and inaccuracy in representing certain communities.[17] As Adler notes, there is a growing recognition in some circles that library classifications are, "reflective of the times and spaces in which they are created, revised, and amended as well as the perspectives and interests of the writers of the classifications, and… we must now take for granted that classifications are inherently biased."[18] As Berry points out, "the language serves the systems, not the subjects."[19] Librarians and archivists are in a good position to locate the need and possibilities for "repair and redress."[20] Offensive and outdated terminology has been the topic of many studies;[21] most recently, the publicity and politicization of efforts to replace the subject heading *illegal aliens* resulted in the Library Congress's ("LC") eventual implementation of the terms "*unauthorized immigration*" and "*noncitizens.*"[22] This case illustrates the considerable amount of effort and time needed to effect change to problematic LC subject headings. While alternative subject headings can be implemented at a local or consortial level, as discussed in by Bone and Lougheed,[23] this is a resource-intensive practice that presents a variety of challenges for libraries.[24]

As well as changes to subject headings in library collections, there is a movement calling for descriptive equity[25] and reparative archival practice to address and redress the power imbalances, harm and erasure resulting from previous practice. There are many examples of case studies where these principles have been applied.[26] Suggested strategies and practices include:

- Diversification of archives, advocacy/promotion, and utilization;[27]
- Reparative archival description: describing and naming whiteness, rather than solely including racial descriptors of non-white subjects;[28] describing and contextualizing racist or problematic language, as well as racist policies and practices that shaped collections; and being transparent and accountable by preserving evidence of racism in legacy description for future study;[29]
- Naming the subjects of records to the same extent as the creators of the content/records[30] and respecting and using the self-descriptive terms and names chosen or preferred by the subjects of the records.[31]

Additionally, many institutions create statements related to bias, harm, exclusionary and offensive language within descriptions and content of the materials (in text, speech, images).

Rogers wrote that these types of statements acknowledge the historical record and may counteract or alleviate harm. She draws attention to the notion that intolerance and misinformation may inflict many different types of harm.[32] While appearing with increasing frequency in both libraries and cultural heritage institutions, these kinds of statements are relatively recent within the long history of libraries and archives. Many statements have been created in the past decade, resulting in a new body of literature consisting primarily of case studies from individual institutions.

For example, Danielle Robichaud, Digital Archivist at the University of Waterloo, described the evolution of her department's statement of language in archival descriptions.[33] The process she described is familiar: conversations over several years, combined with a change in resource (in this case, staffing and a platform to manage records), eventually culminating in working on changes to processes and a statement. In another example, Rogers describes how one donation was the catalyst to implement a statement at Irvine Sullivan Ingram Library at the University of West Georgia.[34] Although the impetus behind such statements is not always disclosed, two major factors are mentioned more than most. The first is increased awareness/sensitivity around anti-Black racism. At an institutional level, references are made to institutional efforts, such as upholding new statements of values or principles. Sector-wide, within the library and archive communities, reference is made to professional responsibilities in the context of the Black Lives Matter movement and the murder of George Floyd through statements by the American Library Association,[35] the Society of American Archivists,[36] as well as the Anti-Racist Description Resources by Archives for Black Lives in Philadelphia.[37]

The second factor was institutions being forced to reckon with these issues when attention was drawn to racist and otherwise offensive material held in their archives and/or digital collections. This is most explicit in cases where photographs of students and staff in blackface were featured in digitized yearbooks. Much attention was brought to instances of this at Hollins University when the institution removed issues of the yearbook from the digital archives until a contextual statement could be posted.[38] The SAA condemned this removal, pointing to the SAA Core Values Statement,[39] and noting that, "impeding access to archival materials that were produced by the institution and that serve to demonstrate the institution's beliefs and norms at the time of production denies the ability to hold the institution accountable for these actions and choices."[40] Other similar examples continue to be found throughout the United States,[41] and in response, more statements are popping up.

Outside of published studies, gray literature also addresses harmful language/content statements. These typically provide insight into working with collections and descriptions, as well as the context of creating statements in a less formal manner. Librarians and archivists can learn from these experiences when making changes at their own institutions. For example, a librarian at the University of North Georgia presented on the process of drafting a statement, including the supporting role of other departments in the university.[42] University of Indiana librarians presented on the harmful language and content reporting system (including a content warning) implemented in their Digital Collection Services.[43] In the UK, Jessica Smith wrote a blog post detailing the issues that served as an impetus to her creating the first content warning on an archival collection at the University of Manchester.[44] Some have gone beyond case studies, including Recollection Wisconsin, a collection of digital cultural heritage resources from local libraries, archives, museums and historical societies. Employees there created a toolkit of resources for institutions considering creating their own statements, highlighting

some of the elements that commonly appear in these statements.[45] Finally, a group from the University of Toronto used their review of the statements listed on the Cataloging Lab website, to inform the creation of their own statements.[46] While their sample was fewer than the number of statements included in this study, they reported on several similar themes, such as inclusion of supplementary resources, justification for providing access to harmful content, noting specific groups identified, user feedback, action and more.

This study aims to add to the literature through a systematic and widespread analysis of statements present in Canadian and American research university libraries. These results will demonstrate what has been done already regarding statements of harm, and in doing so, will highlight what work is still outstanding. It will provide a tool to help librarians and archivists reflect on current practices, and hopefully allow everyone to aim higher in future endeavors, by showing what is possible.

Methodology

The initial sample of libraries in this study included all 109 ARL and twenty-nine CARL member libraries, with 138 libraries in all. The authors manually searched each library website for a statement relating to harmful content, bias, warning, archival or cataloging procedures. Statements ranged from a single sentence on a collection/archive, a warning or label about "historical language," to lengthy webpages discussing potential types of harm within collections and descriptions, to explanations of the library and institution's actions, and everything in between. The authors included all types of statements in the study. From December 2021 to January 2022, the authors ran Google searches and browsed the websites of target institutions to locate statements. From February through May 2022, the authors emailed librarians from a special collections, archival or digital collections unit to ask if the library had a public-facing statement. When a named contact was not listed, the authors sent an email to the unit's contact form or generic email address asking if the library or unit used statements of this kind. Only publicly accessible statements were included in the study; internal statements and policies described in the email responses were excluded. Through email replies, eleven libraries indicated that they did not have public-facing statements but were working toward creating one. New statements have been released since the data-gathering phase of this study. Although the authors did not formally gather data on why institutions did not have statements, some respondents indicated that barriers or delays to creating statements included lack of institutional support as well as limited time and resources to prioritize this work. Others mentioned that they had encountered resistance to undertaking this work at their institutions due to fears that being explicit about the harmful aspects of their collections would draw attention to them and result in unwanted controversy. Others indicated that this type of work is needed but may be uncomfortable, and systems are not in place to support employees.

Where institutions had multiple statements, all statements were considered as a whole, as a representation of the institution's entire effort. For example, when an institution had a public-facing statement related to its archives or archival description and a separate statement related to the content or cataloging of its library collections, both were included in this study. Likewise, statements by various units or institutions within consortia were considered as a whole. Exceptionally, the University of California ("UC") schools were considered separately. The libraries within the UC system have a joint statement; however, some UC libraries also have additional, more specific statements. For that reason, it was pertinent to consider them

as unique institutions. Further, an institution- or collection-wide statement was not required for inclusion in the study; where a statement or note appeared on a single digital collection or finding aid this was included.

The authors created a rubric to systematically record the elements in the statement, including whether the statements referred to collections (materials) or description (cataloging and/or archival description). Collection/materials can refer to anything collected or managed by a library or archive, such as books, digital collections, artifacts, archival collections, images, yearbooks, journals and more. The location of the statements on the institutions' website was noted, such as on the unit's homepage or within a cataloging record. In some cases, a statement was delivered via a pop-up image filter that the user must click through to access the content. In these cases, an accompanying note sometimes explained why the filter was used, for example, "This image contains graphic violence." Other times, the filter did not have any accompanying notes or metadata to explain why it was placed over an image. The rubric was also used to note the method for contacting the unit within the statement, links to further reading, as well as other statements that were listed as inspiration or commitments for improvement (e.g. a unit may commit to update procedures or create working groups to focus on this work). Collating these aspects may help others learn about what is possible and in making decisions when creating and updating their own statements.

Additionally, under "Types of Harm Mentioned," the rubric noted when specific marginalized groups and types of harm were specified in the statements, such as racist, colonialist or sexist material or language. To be included in the rubric, types of harm had to be explicitly named in the statements, and not inferred. This study did not determine if they were accurately representing the description or content but merely noted them, so others can see what has been included in these types of statements. Some types of harm were grouped together in the rubric for readability, and the authors recognize there is bias in creating these groups. When multiple types of harm were mentioned, all were noted; as such, percentages do not sum to 100 percent. For example, a statement that included a phrase such as, "this collection contains racist and sexist content," would be marked both under "racism" and "gender/sexism/misogyny/misogynoir." Additionally, sometimes a statement included a general phrase that the descriptions may be "offensive" and a specific type of harm, such as "ableism," was referred to for a single collection. In that case, the statement would be noted in the rubric under "Offensive/sensitive problematic/objectionable/inappropriate" and "ableism."

Finally, each statement was coded as being a "disclaimer" or "acknowledging harm." Statements referring to the collections or descriptions as simply being a 'product of its time,' or 'historical language' were marked as 'disclaimer'. Often these were short, blanket statements for an entire collection or institution. Statements that indicated that their description or content could cause harm in some way, those that had a regretful tone, or those that indicated extra care might be required were marked as "acknowledging harm." When completing the rubric, the most generous interpretation was given. For example, if a statement had a single-sentence disclaimer that the archival description was historical and based on Library of Congress subject headings that cannot change, but also indicated that the library was taking other steps—such as creating a committee and updating notes on digital collections—it was marked as "acknowledging harm."

Authors coded the statements separately and discussed discrepancies until a consensus was reached.

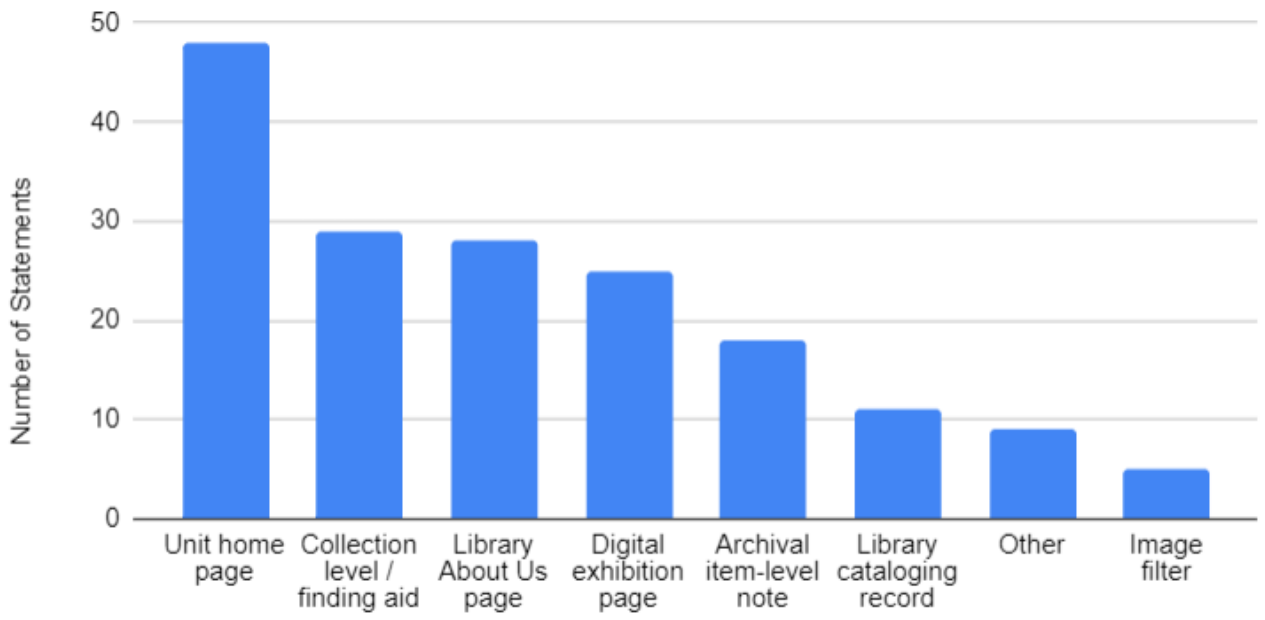
Results

This study identified statements from eleven CARL and sixty-five ARL member libraries, resulting in seventy-six statements in all, or 55 percent of the initial sample. Percentages below are based on the final sample of seventy-six statements. Nearly one-third (32 percent) of those with statements indicated that their institution was working toward improving or adding to their existing statement, but their efforts were not yet public.

Statements could pertain to the content of the collection/materials or cataloging/description. Some institutions had one statement that referenced both, and others had multiple statements. Of the statements in the study, 78 percent (fifty-nine statements) pertained to the collection, and 71 percent (fifty-four statements) pertained to the language in cataloging and description.

The majority of statements, 63 percent, appeared on or were linked from the homepage of special collections and/or archives units, digital collections homepages or the opening screen of a digital collection platform. Statements were sometimes linked in multiple locations (see figure 1). Options noted in "Other" results include blogs, the advanced search page of the library catalog, feedback forms, banners on the catalog (and thus appearing on every record), and the library's legal information page.

FIGURE 1
Where Does the Statement Appear?



Contact Methods

Contact methods related to the statements were noted in the rubric (see table 1). Typically, statements would contain a sentence such as, "If you have feedback or questions about this statement, please contact X." General contact information displayed in website banners or footers that did not relate directly to statements, or "Ask Us!" banners/links to virtual reference were excluded. Some libraries and archives had multiple contact methods and all methods were counted in the rubric. Of special note, UC libraries did not include individuals' email

addresses; however, the Heads of Special Collections Common Knowledge Group University of California Libraries were listed at the end of their primary statement. As these were not specifically listed as contacts, they were not included in the count under "an email address for a specific person."

TABLE 1
Contact Method for Feedback

Method	Count	Percentage
General email address for the unit or library	26	34%
Link to a contact form	22	29%
Phone number	6	8%
Email address for a specific person	4	5%
Email address for a working group	3	4%
Email for a specific role	1	1%

Created By and Last Updated Dates

It is helpful for readers of webpages to know when the page was created or updated. As such, this was noted in the rubric, showing that 34 percent of statements had either a created date or a date of when it was updated.

External Reasons for Creation

While there may be many factors that lead to the creation of these statements, external reasons for creation were listed in 16 percent of statements. These typically include sentences such as "in accordance with" the university's principles, policies, statements of value, or calls to action for specific commitments.

Additional Reading, Referenced Statements and Codes

Links to additional reading were found on 38 percent of statements (twenty-nine). Twenty-four institutions (32 percent) indicated that the statements were based on similar statements from other institutions. Temple University Libraries' statement was referenced the most often, in 14 percent of statements (eleven mentions), followed by Princeton, with 8 percent (six mentions). Yale, Drexel, Duke, University of Colorado Boulder and University of Virginia were referenced in two to three statements each (3-4 percent of the statements). Many others were referenced a single time.

Of the formal codes and guidelines in statements, the "Society of American Archivists Core Values Statement and Code of Ethics," was mentioned the most often, in 16 percent of statements, followed by the "ACRL Code of Ethics for Special Collections Librarians" and the "Society of American Archivists' Statement of Principles Describing Archives: A Content Standard (DACS)," which were both mentioned in 12 percent of statements. The Anti-Racist Description Resources by Archives for Black Lives in Philadelphia was included in 8 percent of statements (n= 6). Many others were mentioned a single time.

Reasoning

The authors devised the rubric by extrapolating the most common elements across statements. In addition to this, several other elements may be relevant for professionals consider-

ing the composition or review of statements. For example, a number of institutions included implicit and explicit explanations as to why the institution devoted resources to collecting, preserving and providing access to potentially harmful language and materials. For example, one statement said, "the archival resources in this exhibition contain offensive and outdated language. We chose not to censor these items in order to accurately represent the bias and prejudice of the time."[47] University of Maryland Libraries states, "this exhibition includes historical attitudes and beliefs about race that are offensive and dehumanizing. We present them in order to provide a more complete and critical examination of the past."[48] The National Archives includes a similar statement: "NARA's mission is to preserve and provide access to the permanent records of the federal government. NARA, working in conjunction with diverse communities, will seek to balance the preservation of this history with sensitivity to how these materials are presented to and perceived by users."[49]

Acknowledging Harm

Short, blanket statements referring to "historical" language and content were marked as 'disclaimers' in the rubric. Statements showing that the library or archive was recognizing harm and that extra care is required to use the collections and read descriptions, were marked as "acknowledging harm." The most generous interpretation of the statements were applied. Of the seventy-six statements in the study, 37 percent (twenty-eight), were marked as disclaimers and 63 percent (forty-eight) were categorized as acknowledging harm. When considering all 138 CARL and ARL member institutions, 35 percent of members have some kind of statement acknowledging harm (forty-eight).

The statements were analyzed for any mention of specific types of harm, and reference to specific groups, events, or categories. table 2 shows the most commonly mentioned types of harm.

TABLE 2
Most Commonly Mentioned Types of Harm

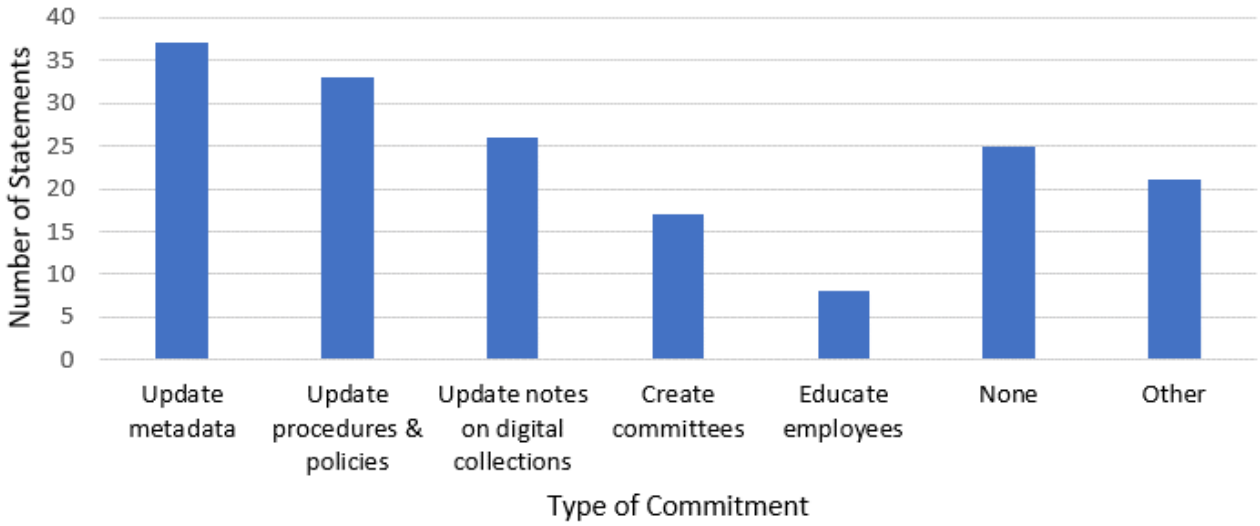
Types of Harm Mentioned	Count	Percentage
Racism	37	49%
Gender/sexism/misogyny/misogynoir	34	45%
Other	29	38%
Sexual orientation/LGBTQ+ /homophobic/ transphobic	29	38%
Ableism	21	28%
Offensive/sensitive/problematic/objectionable/inappropriate	21	28%
Stereotypes	19	25%
Indigenous peoples	14	18%
Black people/culture	13	17%
Colonialism/Imperialism	12	16%
Immigrants/Undocumented immigrants	8	11%
Violence	8	11%
Marginalized people/communities	6	8%
Xenophobic	6	8%
Religion	5	7%

The "Other" category is composed of categories or terms mentioned one or two times amongst all statements. Larger themes emerged from the terms, including gentrification, unhoused people, underrepresented and unserved communities, medical procedures, war, crime and terrorism and terms related to class structure.

Commitments

Some statements included commitments to the wider community regarding additional work that will continue or that is forthcoming, to attempt to move forward in a harm-reducing way. These ranged from broad statements to "do better," and "elevate narratives," to specific lists of action items, such as those described on Yale's Bias Awareness and Responsibility Committee.[50] Time and resource commitments vary widely by institution, and these results provide examples of what can be done; they should not become a prescription. About one-third (33 percent) of statements did not contain commitments of any kind. Updating metadata was the commitment mentioned most frequently, in 49 percent (thirty-seven) statements, followed by updating procedures and policies, updating notes on digital collections, creating committees and educating employees (see figure 2).

FIGURE 2
Commitments



Outside these main categories, other commitments were noted, including working with members of marginalized communities to update language, policies, and collections to become more inclusive and diverse. Some statements referred to prioritizing recruitment of people who have been systematically and historically unrepresented and underrepresented. Several statements also mentioned looking through content for marginalized voices to enhance discoverability of non-white cultures.

Discussion

Given the history of the professions of librarians and archivists, it is unsurprising that collections and discovery are deeply impacted by the myth of neutrality.[51] Archival professionals have started work to overcome this tradition;[52] some of the commitments mentioned in these

statements of harm are examples of this work. Racism and sexism are the most commonly mentioned types of harm in the statements in this study, possibly because instances of these types of systemic harm have already been publicly uncovered in many institutions. As statements of harm are often a first step, many include broad categories, like "racist," without providing more detail about specific communities. When the harms related to specific communities, items and collections are identified, the statements become more useful to everyone, including the employees who work in the institutions, the patrons they serve, and the people and places represented in the collections. As Rogers states, a "synergy occurs when people come together to discuss an issue; the sum is greater than its parts."[53] However, detailed statements and commitments to changing processes require ample resources to analyze and prioritize this work.[54] Nevertheless, starting with a broad statement is more helpful than not having a statement at all. Over time, these can be updated, potentially in collaboration with the affected community groups.

The impact of meaningful statements reaches beyond acknowledgement of the collections and descriptions themselves, beyond a simple warning. While they do not absolve institutions nor "fix" systemic issues, statements represent a signal that the institution is aware of its complicity in perpetuating harmful acquisition and descriptive practices and recognizes the complexity of the situation rather than ignoring it. As Warren states, "when archives ignore or emphasize one narrative over another, it influences how people see themselves and how others see them."[55] Douglas encourages actively embracing what she called the "constructedness" of archival fonds, to openly acknowledge that archives are, "built by many hands and formed over time."[56] Both Warren and Douglas highlight the need for institutions to continue looking at and improving upon its conventions, traditions and processes. A statement is a start. It is positive that over half of CARL and ARL member institutions already have a statement of harm of some kind, and that many are working toward creating or improving one.

Many of the statements in this study (63 percent) were located on the homepage of special collections, archives and digital collections. However, patrons often arrive at a record, note, or digital collection through a different page—such as a catalog, database or an internet search engine—and may not see the statement. Moreover, the statements in this study were often not easily findable through a Google search or a scan of the institution's website; rather, direct links were made available through the email replies received while conducting this research. When statements are more general in nature, about entire collections, subject headings or problematic areas at a high-level, it may be appropriate to have them on the special collections or archives' homepages. However, having them visible, or linked to, within the records of library catalogs or archival records would make them easier for patrons to come across.

Furthermore, institutions that have more resources to dedicate to this work can place notes or statements directly on the page about the items. A common example of this is when yearbooks contain offensive content. Currently, many yearbook collections contain a single-sentence blanket statement about historical language/images that can be found on the webpage with information about the yearbooks. In the future, this would be a good place for a longer statement about harmful content, in tandem with item-level details on specific yearbooks. More research is needed about where best to place these types of statements for meaningful visibility and impact.

Easily available contact information and dates of when the statement was last updated provide credibility. They are signals to patrons that the institutions are taking the statement

seriously enough that they have provided and prioritized resources recently, and are open to receiving feedback. Some institutions simply do not have these resources yet. As time passes, language evolves and new ways of thinking come to light, so a date on these types of statements is extremely important; however, only 34 percent of statements had either a created date or a date of when it was updated. The most common contact methods found on statements in this study included a general email address for the unit or library (34 percent) and links to contact forms (29 percent).

While 16 percent of statements explicitly stated they were created due to an external reason—such as in accordance with a set of principles, policies, or call to action—it is possible that this number could be higher. Some institutions may have chosen not to disclose this information within their statements. For example, Canada's Truth and Reconciliation Commission Calls to Action include steps for archives, museums, and Library and Archives Canada regarding records relevant to the history and legacy of the residential school system, and a national review of best practices.[57] This work may be ongoing but simply not posted in a public statement. Regardless of whether the reasons for creating the statement are disclosed, creating these types of statements builds community within the people who work at the institution, and it fosters discussion and engagement between the institutions and the communities they serve.[58] Patrons and employees may also stand to learn from the additional readings when they are provided.

Writing these statements of harm is a relatively new practice in the library and archives community. As such, there is a lack of best practices, standards or codes from the major associations to help guide their creation. Having these types of statements or prioritizing this work is also not a condition of membership in ARL or CARL. Many statements are created in a grassroots fashion, often pushed forward because of a personal interest of a single librarian or archivist. It would help the profession as a whole, and the patrons they serve, if best practices or standards were released to guide this work, as it can be overwhelming to get started. Until then, the results of this study will hopefully help those who are thinking of writing or improving a statement and provide resources for creating one.

Limitations and Future Research

One limitation to this study is that the sample included only ARL and CARL member libraries. The authors chose this sample because they work in an ARL- and CARL-member institution, but it is in no way reflective of the qualification or ability of institutions to formulate and disseminate these types of statements. Future studies could broaden the scope to other geographic areas, other types of libraries and other types of institutions and collections, including galleries, museums and beyond. For example, Cataloging Lab's List of Statements includes many excellent and interesting statements from other types of organizations and jurisdictions. Much can be learned by venturing beyond the library and archives landscape.

This study is also limited by the authors' privilege and bias as white cisgender women who work in a large, research-intensive academic library. This area of study would benefit from the perspectives and knowledge of a more diverse group of authors, and would be enriched by interviews with community members, both as subjects and users of the collections to which these statements pertain.

One of the challenges noted in the literature—and by librarians and archivists who were contacted for this study—was the constraints imposed by library and archival technologies

and systems. Other methods for acknowledging harm, such as through new interpretations of archival processing notes or the creation of accompanying LibGuides were outside the scope of this study but may address some of these challenges.[59]

Future research could also include a deeper analysis related to the content of these types of statements and a reflection on the objectives of creating them. What do different types of communities want these statements to address? What is helpful for different types of researchers to know ahead of time? Are they effective? Where did the authors get it wrong? Further research might also investigate the processes by which these statements were created, approved and disseminated. Compiling qualitative data on what worked well, the challenges encountered and how these were addressed may serve institutions looking to implement similar statements. These questions can be investigated as libraries and archives continue to acknowledge their past and move forward, respectfully.

Conclusion

The types of statements analyzed in this study are a first step, the start of a bridge to close the gap into finding out who and what is missing, misrepresented and underrepresented within the stories of our collections and descriptions. They can help show the community how an institution is reckoning with its own role, and can help us reflect and move forward in collaboration with our patrons in a way that was not common in the recent past. This study shows the quantity and commonalities amongst the statements within the ARL and CARL member institutions today. In time, perhaps with some guidance from the large associations, we can move beyond these types of studies and see the creation and implementation of best practices. Hopefully institutions will continually increase their support for prioritizing this type of work so that the stories can continue to evolve and so all patrons can be included respectfully.

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How Do Authors Choose Keywords for Their Theses and Dissertations in Repositories of University Libraries? An Introspection-Based Enquiry

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Considering the importance of subject retrieval for scientific visibility, and the need to guide authors in self-archiving their papers in institutional repositories of university libraries, this study observed the patterns and strategies used by authors while indexing for keyword assignment. The study examined four categories of analysis: criteria for keyword assignment; use of controlled vocabulary for keyword assignment; understanding of the importance of keywords; and ordering criteria and function of assigned keywords. The study found that, while assigning keywords, authors: consider fundamental concepts for representing significant content of the text; act as domain expert indexers; and are unaware that keyword assignment is an indexing process that requires controlled vocabularies. The research suggests that institutional repositories implement a hybrid information representation and retrieval system to allow for both the representation of more specific subjects of knowledge domains, as well as controlled vocabulary indexing terms.

Introduction

Scientific communication is shaped by the characteristics of a scientific communication system, with several interdependent component actors whose objectives are related and interconnected.[1]

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Institutional repositories of university libraries store collections of digital objects and provide basic deposit and retrieval methods, and in many cases provide additional features such as security, and a protocol for remote and distributed access. Institutional repositories are intended for assembling and storing all the intellectual output of a given institution, or consortium of institutions, such as universities for long-term preservation, access, and distribution.[2] Within these context, the librarian acts as an information specialist who focuses on the primary, interdependent elements of the scientific-academic communication system in two main aspects: the encouragement of research production by the university faculty, and the means of communication available for sharing these results.

This information professional specialist, by developing information representation activities with different discourse domains, uses knowledge organization processes and systems with the specific goal of producing descriptive or thematic metadata. This metadata has precise and specific value in a future and likely retrieval in information systems' search interfaces (web, databases, institutional repositories, online catalogs, search engine websites, etc.). In this way, information resources are identified, described, organized, and communicated to serve specific purposes.

Traditionally, in university libraries, the professional information specialist librarian performs this representation; however, scientific publications in born-digital format—such as journal articles, proceeding articles, theses and dissertations—are increasingly published through interactive software which enables the submission and representation of the original papers by the author. In the submission process of institutional repositories of university libraries, considered self-archiving, the author of the original paper produces the descriptive and thematic metadata that represent the material and content description. However, when submitting to the institutional repository, and while filling out the descriptive and thematic metadata, authors are unaware of the processes and knowledge organization systems. In addition, authors are not guided to efficiently complete this task, nor to understand the implicit objectives of the results to be obtained in information retrieval search systems to facilitate the publication citation.

When filling in keyword metadata within the institutional repository—to represent the content of their original papers—authors become indexers. The keyword assignment for representation, even in natural language, carries the meaning of the content. The authors' process of keyword assignment is loaded with subjectivity as it depends on their individual cognition or knowledge which, without guidance on the purpose of the representation process, will not perform the integration between individual and social levels.

Authors are experts on their thesis or dissertation topic, and knowledgeable in the discourse domain, whose main goal is to communicate and disseminate their knowledge; however, they are not information professionals. Thus, the main question guiding this paper is: how do thesis and dissertation authors choose keywords in institutional repositories of university libraries?

Efficient retrieval, by Topic/Subject, in an academic library's institutional repository facilitates the visibility of the that university's research. Thus, it would be wise to provide guidance for authors self-archiving their work in such information retrieval systems. The objective of this investigation was to observe strategies used by researchers, particularly authors of theses and dissertations, while indexing for keyword assignment in self-archiving institutional repositories at Brazilian universities. To this end, a theoretical and methodological study was carried out on the

introspective and retrospective observation of patterns and strategies in keyword assignment by authors as indexers. The observation of introspection and retrospection of thesis and dissertation authors as domain expert indexers was performed using the Individual Verbal Protocol (IVP) technique to analyze the mental process of keyword assignment and, through qualitative analysis of these authors' cognition, report criteria for assignment, use of controlled vocabulary, understanding about the importance of the keyword and criteria for keyword ordering and function.

Literature Review

The concept of a keyword is linked to natural language (i.e. without vocabulary control) and to the publication's author, who freely assigns it. Natural language is how the keyword is configured, according to the ANSI/NISO standard (American National Standards Institute; National Information Standards Organization, 2005).[3]

In keyword assignment, the author provides the main ideas of their work and chooses keywords without consideration for controlled vocabulary.[4,5,6] Authors select the keywords they believe best represent the content of their writing,[7] and often select with care.[8]

Keywords are not exclusively assigned by authors; publishers and/or machine algorithms may also assign keywords. Zhang et al. conducted research on comparative assessment between Author Keywords and Keywords Plus, extracted from the titles of references cited by Thomson Reuters, whose results revealed similar search trends.[9]

The free choice mode of keywords refers to the lack of a more systematized process. With free choice, keywords are subject to each author's individual judgement. This is different from the subject indexing process practiced by professional indexers, in which the identification of indexing terms is performed by subject analysis of the textual content and then represented by terms from a controlled vocabulary. Essentially, keywords and indexing terms result from different processes: keywords can be extracted from any part of the document without having a vocabulary control to be applied, whereas with indexing terms, "the term is the result of complex mental activities, which involve the processes of conceptual analysis (identification of document subjects) and translation (conversion of the conceptual analysis into a given set of terms)."[10] The main factor is that authors select keywords that represent what they consider important to describe the content of their own article, and indexers, in contrast, consider the article in the larger scope of the collection.[11] Névéol et al. agree that the significant differences between keyword assignment and subject indexing are due to the fact that, "authors are asked to choose a small number of keywords, without reference to a controlled vocabulary; whereas indexers are trained to select indexing terms according to a specific protocol."[12]

More than one actor—the author and the indexing librarian—performs the indexing of scientific publications, journal articles, theses, and dissertations undertaken in digital libraries. Holstrom et al. consider that subject indexing can be done by four types of actors: professional indexers, domain experts, casual indexers, and machine algorithms.[13,14] Their article investigates and discusses the feasibility of what he termed a "hybrid approach" in which several different actors perform subject indexing of the same information object, result in benefits for subject searches.[15]

Although keywords lack standardization, Gonçalves identified keywords with relevant functions and characteristics, such as type of research (e.g. exploratory, theoretical, etc.) and context of the study.[16] For example, proper names perform the function of keywords as exemplified by Gonçalves in the citation of proper names such as "Gramsci" or "Kant."[17]

Considering the different functionalities that keywords assume, Lu et al. investigated how selected keywords function semantically in scientific publications.[18] To do this, they performed manual processing of articles from the Journal of Informetrics and performed a manual annotation scheme of keyword functions such as "research topic," "research method," "research object," "research area," "data," and "other" based on content analysis of the texts. The results showed that the diversity of keyword functions decreases, but irregularity increases with the number of keywords assigned by the author. The conclusions indicated that research should take into account the different types of keywords selected by the author.

In research on applying bibliometric analysis in automatic keyword extraction, Li used function differentiation for keywords, combined with topic term classification of texts, and concluded that the proposed function differentiation for keywords partially improves the selection of high-frequency words, particularly for text topic queries.[19]

The current landscape of digital environments endowed with digital tools and objects supports different actors performing indexing, and it is both possible and necessary for information professionals, domain experts, and authors of academic papers to improve subject indexing experiences on these information objects.

However, according to Fujita, et al., submission rules of scientific journals or self-archiving systems, in general, offer no guidelines for authors on subject indexing procedures for keyword assignment.[20] Pereira de Oliveira et al. analyzed the submission guidelines of various Brazilian journals of Information Science for advice on assigning keywords to articles. They found that journal guidelines largely only addressed the number of keywords, and did not provide guidance regarding how to select keywords, nor the use of controlled vocabulary. The authors recommended developing an indexing policy that provides clear advice to the authors at the time of keyword assignment.[21] Similarly, while self-archiving their academic papers in institutional repositories of university libraries, authors are usually not given information about keyword assignment, use of controlled vocabularies, or vocabulary expansion;[22] when they are guided, the submission guidelines are not publicly accessible in the system.

Very specialized areas require controlled vocabularies, or natural language keywords, which reflect the innovative and unique vocabulary of a particular groups of researchers.

The lack of an indexing method that performs the representation of indexed content with controlled vocabulary is the main disadvantage of keyword assignment. Using the Verbal Protocol to observe the mental strategies used by theses and dissertation authors during keyword assignment is an innovative approach, and this study contributes to indexing research by considering the perspective of ordering and functions assigned to keywords in the context of the authors' area of scientific expertise.

Methodology

The Individual Verbal Protocol, also known as "Thinking Aloud," has its origins in studies in Cognitive Psychology in the precursor studies by Ericsson and Simon.[23, 24] It is based on the use of introspection for "observing, obtaining and describing structures of the content of subjects' conscious experiences, with a focus on discovering the similarities of human behavior."[25] The methodology consists of recording the verbal externalization of thoughts during the reading activity, that is, the individuals read and interpret at the same time, verbally externalizing everything that "crosses their mind" while reading.

This introspective technique has been applied in many areas of knowledge, including eighty-one papers published in the area of Information Science from 1989 to 2013, according to Alonso-Arroyo et al.[26] In Information Science, the "Thinking Aloud" technique has been used—by Fujita et al.,[27] Fujita and Rubi,[28] and Redigolo, et al.,[29] among others—to research information search, usability, image search, relevance judgments, terminological understanding, visual information processing, abstract preparation and reading during indexing documents. This study used Individual Verbal Protocol—introspection and retrospection observation of thesis and dissertation authors as expert indexers of their domain—to analyze not only authors' mental process of keyword assignment but also, through a qualitative analysis of these authors' cognition, to report criteria for assignment, use of controlled vocabulary, understanding keyword importance, and criteria for keyword ordering and function.

The qualitative validity of a reduced sample of Individual Verbal Protocols represents the results of observing individual cognitive processes regarding the performance of a given task by individuals qualified for the task. Research applying the verbal protocol for observation and analysis of the thought process, behavior, and strategies used during task execution contribute to a better understanding of the phenomena under study.[30] This study applies the verbal protocol as a technique for collecting and analyzing information to obtain introspective verbal reports, which reveal the strategies employed by theses and dissertation authors in keyword assignment. Thinking aloud represents an additional task for participants to perform; therefore, five protocols are analyzed. This technique provides more accurate information about keyword assignment right at the moment it is being performed, that is, when particular cognitive behaviors occur.[31] This provides more direct access to an author's actual mental process during keyword assignment, whereas other techniques occur after the keyword assignment process.

Although this study's sample size is small, it benefits from analyzing the authors' choices while they performed the task of assigning keywords. Using a qualitative approach to observing how participants carried out their task, analysis and results were based on participants' cognitive expression.

By observing the UNESP institutional repository, we have verified that chosen keywords were, in fact, the authors' natural language. The natural language keywords assigned by the authors is available in the collected scientific production records, in the on-demand archiving, and in the self-archiving by thesis and dissertation authors. No vocabulary control is performed with the keywords collected from the metadata, which are available in an alphabetical list for consultation by users during the search. This alphabetical list presents variations of the same word with the use of singular or plural, capital letters or lowercase, use of quotation marks and other signs such as hyphen, and so on. No treatment is carried out to reduce these variations.

Despite having a search interface and several "filters" for refining searches, the authors use natural language with no vocabulary control tools in the formulation of the search for retrieval. The expanded query feature during the search is not available.

The definition of participating authors was based on the category of graduate students who self-archive their thesis or dissertation in the UNESP Institutional Repository upon completion of their master's or doctoral degree, in Information Science or Education on the Marília/SP campus. This study's sample size was five authors.

For the application of the online semi-structured interview using the Individual Verbal Protocol (IVP) qualitative methodology on the self-archiving of theses and dissertations in

the UNESP Institutional Repository, the following procedures were outlined: prior to self-archiving; while self-archiving; and post self-archiving.

Procedures Prior to Self-archiving

Definition of the Research Universe

The organizational context of the UNESP Institutional Repository was chosen for the observation of the self-archiving process of theses and dissertations through semi-structured interviews. Implemented in 2013, the Universidade Estadual Paulista (UNESP) Institutional Repository aims to, "store, preserve, disseminate, and enable open access, as a global public good, to the university's scientific, academic, artistic, technical, and administrative production," guided by the Internal Regulations of the UNESP Institutional Repository (UNESP, 2019). The UNESP Institutional Repository performs, in addition to automatic collection, archiving on demand, and self-archiving. In the self-archiving modality, it provides researchers and authors of theses, dissertations, and final papers with an interface for filling out the metadata of material and thematic description and submission of the original paper.

Selection of Authors/Participants

The study's five participants were graduate students in the master's and doctoral courses at the Marilia campus. An informal conversation was held with each of the authors through social media and/or e-mail, resulting in the acceptance and scheduling of the interview dates. For the analysis of the Verbal Protocol transcripts, the authors' identities were anonymized through specific initials, according to the level and graduate course to which they belong (table 1):

TABLE 1
Authors Participating in the Research and their Initials for Identification and Analysis of the Verbal Protocols

Level	Course	Identification
Master's Degree	Graduate Program in Information Science	M-CI
Doctorate	Graduate Program in Information Science	D-CI1
	Graduate Program in Information Science	D-CI2
	Graduate Program in Education	D-E1
	Graduate Program in Education	D-E2

Informal Conversation with the Authors

Informal conversations with the authors went as follows:

- The research objectives were explained to the participating authors and each was given the Informed Consent Form (ICF) signed by the researchers. The authors were asked to sign the document and formally accept participation in the research; an original document was sent to them. The researchers highlighted that their identity would remain anonymous. The purpose was to make the authors as comfortable as possible not compromise the data during the interview and the data collection recording.
- The authors were asked to briefly explain their research.
- The authors were introduced to the Individual Verbal Protocol (IVP) methodology and its basic guidelines (Appendix A).

Procedures While Self-archiving

Self-archiving in the UNESP Institutional Repository

The researchers started videoconference sessions with the participating authors. Participants were instructed to start the self-archiving process in the system and share their screen with the researchers for later analysis. Both the self-archiving process performance and the authors' verbalizations were recorded. At this moment, the researchers turned off video and audio not to interfere with the self-archiving process or verbalizations.

Keyword Assignment

The researchers verified the process the participants used to assign keywords to their theses and dissertations, writing down the keywords selection both in Portuguese and in English, as well as the cognitive and metacognitive strategies the participants used.

Retrospective Interview

Retrospective interviews were conducted with the authors so that they could complement their opinions about the performed activity. The questions were developed from the initial research question: "How do authors of theses and dissertations choose keywords in the institutional repositories of university libraries?" and were as follows:

- What criteria did you use to assign your thesis/dissertation keywords in the Repository?
- Did you feel the need to use a vocabulary control for choosing keywords?
- How did you decide on the order of the keywords and what function does each one have?
- How important are keywords to you?

At the end of each semi-structured interview, the recordings were automatically saved in the Google Drive tool.

Procedures Post Subject Searches

Literal Transcription of the Authors' Verbalization Recordings

The transcription of the authors' verbalizations was carried out during the self-archiving at UNESP Institutional Repository. For this, specific IVP notation was used (Appendix B).

Analysis of the Authors' Verbalization Recording

A detailed reading of the recording transcriptions was carried out, to search for significant phenomena for the elaboration of categories of analysis

Definition of the Categories of Analysis

These were based both on the retrospective interview questions and on the data collected from the Verbal Protocol application to the authors during the self-archiving of theses and dissertations in the UNESP Institutional Repository (table 2), considering the initial research question: "How do authors of theses and dissertations choose keywords in the institutional repositories of university libraries?"

Rereading of the Data to Extract Excerpts that Exemplified Each Category of Analysis

The semi-structured interview transcripts were reread to extract excerpts from the discussion that best exemplified each category of analysis by synthesizing the main observed aspects.

TABLE 2
Retrospective Interview Questions and Categories of Analysis

Question—Retrospective Interview	Category of Analysis
What criteria did you use to define your thesis/ dissertation keywords in the Repository?	Criteria for assigning keywords
Did you feel the need to use a vocabulary control for assigning keywords?	Use of controlled vocabulary for keyword assignment
How important are keywords to you?	Conception about the importance of keywords
How did you decide on the order of the keywords and what function does each one have?	Criteria for ordering and function of assigned keywords

Results

The presentation of the results was carried out in a qualitative way to allow the study of the strategies used at the moment of self-archiving in the UNESP Institutional Repository, and to analyze the cognitive and metacognitive aspects of the participants in view of the questions and the investigation objective. The small number of participants allowed the researchers to use the Individual Verbal Protocol (IVP) to analyze the methods participants used to select keywords. The categories of analysis were created according to the authors' answers and the questions of the retrospective interview as guidelines for their elaboration (see table 2).

The presentation of the results shows the categories of analysis and their rationale, the perceptions obtained during the procedures adopted in the self-archiving in the Repository, and the excerpts taken from the interview with the authors. Different acronyms were used to anonymize the participants, as shown in table 2.

Criteria for Assigning Keywords

Category Description

Criteria for assigning keywords refers to the parameters adopted by the authors to choose the terms that best represent the research developed in the thesis/ dissertation.

Author D-CI1 expressed difficulties in locating representative terms in the controlled vocabularies, as many did not contemplate the level of specificity of the terms worked in his/her research. For example, the author cited the term "social media," which is not included in the information representation instruments; "social networks" is offered as an equivalent, however, this term is conceptually different. Thus, D-CI1 stated, "we are tied to the instruments, but the instruments do not represent what we research." Author M-CI justified the use of their keywords from the object to be investigated, while for D-CI2, the keyword identification follows the employed scientific methods. When D-CI1 said they were, "always thinking about the one who is going to find my thesis," and "that those words had a direct identity with my work," they expressed the direct relationship between the developed research and the users' search process in the system as criteria for assigning keywords, in addition to retrieval and the visibility of their research.

To decide on the keyword order, author D-E2 considered the objective of their work, following a logical sequence that contemplates the object of the study, the type of the object, the subject acting on the object, and the aspect through which the subject is observed. Based on their research, the participant explained why they chosen certain keywords:

> First the object of all investigation that was the writing (…) After the definition of this first one, I had to define the writing of what? Writing of argumentative statement, then I defined the genre OPINION ARTICLE. Writing of the opinion article. But opinion article writing, second keyword, by whom? By students, by subjects, so I used the word, the term, SUBJECT. (…) I defined SOCIAL AWARENESS because awareness is a very broad term, very broad. So social awareness is in the sense of human values and meanings.

Author D-E1 stated that, "[keywords] are the words that really give the general idea of our work," and that the adopted criteria are related to the role each keyword plays in the research, with the first assigned keyword, "Afro-Antillean woman," as the main object. Next, the place or geographical limit contemplated in the research, "'Rondônia', and the area of knowledge, 'Education,' as "RONDÔNIA is because of our region, which … is the limit … is … spatial, geographical and … EDUCATION because the thesis is on EDUCATION." The fourth keyword, "bibliographical analysis," is linked to the method used in the research. The participant explained, "because we start from the historical text, but we also use documentary source, confronting with the documentary source and … and BIBLIOGRAPHICAL." Finally, the keyword phrase "cultural studies," represents the theoretical approach of the research, that is, the "theoretical line."Regarding keyword translation, author D-CI1 had doubts about the insertion of terms in Spanish, asking, "should I also assign in Spanish, knowing these terms but not being in my thesis?…~~ If I think I explored the environment in Spanish … is … from Spain and that I want people to retrieve that thesis, maybe I put them, but what if that is … block … my submission and delay my certificate issuance? …~~ Do I call the chat … to help me? … A librarian? … I'll … ah, no." Although the participant recognized the possibility of enhancing retrieval of their dissertation by assigning keywords in an additional language, they decided not to include them. Similarly, author D-E1 only assigned keywords in Portuguese and English.

Use of Controlled Vocabulary for Keyword Assignment

The use of controlled vocabulary for assigning keywords refers to the use of controlled language for choosing keywords. It is divided into two sub-items to distinguish when controlled vocabularies are used: when assigning the keywords in the paper and when self-archiving it in the UNESP Institutional Repository.

Use of Controlled Vocabulary for Assigning Keywords in the Thesis or Dissertation

When inserting the dissertation keywords in self-archiving the paper in the UNESP Institutional Repository, author D-CI1 was asked about the guidelines to consult the UNESP Thesaurus to assign the keywords; they replied, "here I have a doubt … if I have already assigned in my text the keyword … which I thought … the words that represent my subject … is it an obligation …. does UNESP make me put in my dissertation the terms that are in the UNESP thesaurus? … And now, if this is the case … I will have to consult the terms … that I chose, and if I don't have them here, will I put them in or not?" This guideline is available only at the time of author self-archiving (i.e., there is no formal guidelines for authors prior to the submission process to adopt the UNESP Thesaurus while the thesis/dissertation is still under development) causing confusion to the authors.

Author D-E1 stated that they did not consult the UNESP Thesaurus to assign the keywords for their thesis, due to the level of specificity reached by the first assigned keyword, as well as the object of study of the research: "Afro-Antillean woman." The participant stated:

> yes … so I was sure that it doesn't have. (…) But I am sure it has … RONDONIA, EDUCATION, BIBLIOGRAPHICAL AND DOCUMENTAL ANALYSIS, and CULTURAL STUDIES ((RI)). […] The only keyword that I was sure I did not have and I said, ah, I will not consult.

This quote highlights the importance of updating the controlled language, in this case, the UNESP Thesaurus, in order to follow the dynamics of the scientific development of the respective areas of knowledge it covers. As for other keywords, participants did not consult the UNESP Thesaurus because they were sure the keywords would be located in this controlled language; however, there was no need to perform such consultation/validation.

Author D-E2 did not feel the need to consult a controlled vocabulary for assigning keywords for their dissertation, pointing out that they had not used a controlled vocabulary for their selection; instead they said that, "the choice of keywords and their order followed the philosophy of language theory." It can be observed that the author was probably unaware of the function of a controlled vocabulary. Author M-CI consulted the UNESP Thesaurus, a controlled language used by UNESP Network to standardize the subjects assigned to the documents inserted in the Athena catalog, but did not find the desired term used in their research. This participant found a conceptually similar term, but chose not to follow the vocabulary, saying, "I ended up not using [the thesaurus], I was supposed to use DOCUMENTARY LANGUAGE, because we defined that the term to refer to it would be INDEXING LANGUAGE."

Use of Controlled Vocabulary During Self-archiving of Thesis or Dissertation

Three participating authors did consult the UNESP Thesaurus and understood the importance of having a control over the terminological issue. However, not all terms were found in the vocabulary and the authors were in doubt about how to proceed, opting to maintain the terms they had already defined as keywords. For example, author D-CI1 stated, "I will risk it, I will add my keywords, I hope that with this I can signal to them that this term is important, is represented in the research, that they can incorporate them, sometimes I am helping … and giving suggestions for terms." Author D-CI2 consulted the controlled vocabulary to better represent their work, saying, "when assigning keywords, we try to verify … if those keywords … were large areas, if they were being placed in the right way, if they really represented the work… So, in our case, we tried to do a control, yes." Author D-CI1 tried to consult the UNESP Institutional Repository tutorial to seek guidelines to help their decision at this point but didn't find the guidelines.

When choosing keywords for their thesis, author M-CI had no concern about not finding the desired term; however, M-CI became concerned when self-archiving in the UNESP Institutional Repository because they only found two relevant terms in the institution's vocabulary. Therefore, in selecting other keywords, M-CI decided to follow the keywords already predefined in their research, saying, "And now I don't know what I to do (…) As a related term it gives me DOCUMENTARY LANGUAGE (…) should I put DOCUMENTARY LANGUAGE or INDEXING LANGUAGE? So, I will look at the thesaurus manual (?) It shows how to use

it, but in my case, I will have to make a choice. I will add INDEXING LANGUAGE." Author D-CI1 suggested training for authors using the UNESP Institutional Repository, on how to select keywords, and what to do when the terms are not found in the used vocabulary, sharing, "I feel that it lacks … a … instruction, a capacity building, a training on whether it is mandatory, not mandatory, (…) I understand that these instruments … they are not thought up for nothing, is to find the information, but … we need to train the user in advance." The other two authors did not consult any type of vocabulary. One author explained that they did not consult it because they knew they would not get the desired term, because their research uses very specific terms, saying, "I did not consult the thesaurus, the UNESP thesaurus … because I knew I wouldn't have … I was sure there would be no AFRO-ANTILLIAN WOMAN… So … I kept typing and including my keywords."

Understanding the Importance of Keywords

The study checked the authors' opinion and understanding about keywords.

The participating authors understood the importance of keywords and two main themes emerged. First, participants understood that keywords function as a way to represent the main points of their research in a condensed way. As author D-E1 expressed, "the keywords go back to your work, it is the map of the work, it is the face of the work. The keywords, in five words, describe … the most factual, the most … is … the identity of the work, the identity of the work." Author D-E2 agreed with this perspective stating that keywords guide "both for the one who writes and for the future reader, for all potential readers." In short, as author M-CI stated, "keywords are the basic summaries of even the essentials of the document. If not well defined, they will not represent the essence of the work."

The second function of keywords frequently noted by the participants was for information retrieval. Participants understood that their papers would be retrieved through the keywords. As explained by author D-CI2 "I think it is extremely important not only for the identification issue, but also for the retrieval of the work itself, because if you correctly assign the keywords you end up retrieving exactly what you are… you want to make available… for your reader, when you don't assign the keywords correctly, normally he will not retrieve what he would like to retrieve." This situation causes retrieval problems in the Institutional Repository, as "many times you do research, a bibliographical survey, and end up getting papers that are not coherent with what is written in the keywords."

Criteria for Ordering and Function of Assigned Keywords

The criteria for ordering and function of the assigned keywords identifies the principles for deciding the sequence of keywords assigned by the authors.

In choosing the order of keywords, author D-CI1 was guided by the research objective, and used a broader concept—"Digital Media"—after contemplating other terms, such as "Resources" and "Sharing Networks." D-CI1 explained, "SOCIAL MEDIA is an umbrella concept, it is the object of research and it is the term we defend; So, because it is a more generic term and represents the most, it was the first one to be chosen." D-CI1 chose the term "Web 2.0 Technologies" "because Web 2.0 is the concept where it emerged, without it, SOCIAL NETWORKS and SOCIAL MEDIA would not exist. So, in a conceptual matter of supporting this object today that underlies and sustains it, it is WEB 2.0 TECHNOLOGIES." Next, D-CI1 chose "Social media," "because the term is widely used by the discursive community."

According to the D-CI1, "MEDIA, TECHNOLOGY and NETWORKS are three terms from the same family used … to represent these information environments, it is … online, from the web, so we used them together." The two last terms were defined by the research setting: "Libraries;" "and by the methodology used: 'Domain analysis.'"Defining the keywords based on the scope of the term, as well as the form used by the discourse community, suggests that participants were concerned with making their selected keywords representative enough to achieve a broader understanding of the research. Starting from the main research object, author D-E1 chose the term "Afro-Antillean woman" as the first keyword, explaining, "the woman is the main reference, the woman in EDUCATION, the AFRO-ANTILLIAN WOMAN in EDUCATION and as the text, the title says, so we chose the question of the woman, because it is the basis, … of our work." The second and third terms were selected based on the research setting, that is, the region of the state of "Rondônia," since "*RONDONIA is the space, the region, the Amazon region,*" whereas "Education" is the research theme centered on the education of Afro-Antillean women. Author D-E1 explained, "EDUCATION in third place… because we work on the issue of women in EDUCATION, black teachers in EDUCATION in the Amazon." Finally, D-E1 chose "Bibliographic and documental analysis," and "Cultural studies" as terms, stating that these elements form "the basis of [their] research." In this instance, keyword ordering was guided by the main concepts of the research; keywords were seen as fundamentally representing the work. The two authors used similar criteria to choose the two final keywords, based on the research setting and the methodology used.

At first, author D-CI2 reported that keyword ordering was based on the research methodology. D-CI2 chose "domain analysis," explaining that this keyword "came first because it was the method I used to be able to develop the rest of my work." However, D-CI2 did not select their other keywords based on importance, sharing, "the others … I cannot say that there was a… how do you say? A degree of importance." From the questions asked in the retrospective interview, the author reports reflecting on the issues raised about the keyword ordering, considering a new sequence from this reflection.

On the other hand, author D-E2 reported following an specific order beginning with the research object, "writing," followed by a logical sequence for the definition of the other keywords: "opinion article genre," "subject," and "social awareness." D-E2 shared, "we imagined a sequence, THE WRITTEN language, argumentative genre, OPINION ARTICLE. Maybe it wouldn't be illogical to think first about the subject and then choose a genre, would it? First, we think of the language, the WRITTEN language and then we define the genre and then we define who is going to construct that genre, the subject."

Analysis of Results

In response to the research question, "How do thesis and dissertation authors choose keywords in institutional repositories of university libraries?" the results indicate that the way theses and dissertations authors choose keywords is directly related to the level of specificity of the research conducted in the domain. Therefore, many new terms are used and could be aggregated as related to the controlled vocabulary authorizers, as Peset also observed.[32] The selected terms directly relate to the topic, the object and objective of the research, and according to scientific methods used; however, keywords were also selected with a view to the research retrieval and visibility. In the keyword ordering and function, ordered sequences of functions are indicated by the authors. Participating authors contemplated the object of study, the type

of the object, the subject acting on the object, and the aspect by which the subject is observed; this aligns with Lu et al.'s findings.[33] In another sequence, authors assigned keywords that represent the topic of the subject, the geographical location, the method, and the theoretical approach, as Gonçalves also noted.[34] Therefore, an ordering principle for assigning keywords is verified, guided by semantic functions from the main concepts disseminated in the research and representative of the specialized domain in which the thesis or dissertation was generated.

Keyword assignment is performed at two moments, after the abstract in the pre-textual part of the thesis or dissertation, and during self-archiving for filling the subject metadata in the Repository. The guidance for using controlled vocabulary is available during self-archiving, but not during the formal preparation of the thesis and dissertation text. The use of controlled vocabulary was not necessary for the authors who were probably unaware of it. However, when they self-archived participants understood the importance of vocabulary control. If participants were unable to find a precise match for their choice of keywords with the controlled vocabulary terms, they decided to maintain their previously assigned keywords which were conceptually compatible with the meaningful content of the text, as Li et al.,[35] Zhang et al.,[36] and Peset also found.[37] The use of the controlled vocabulary was not understood by the authors who did not find a tutorial available with guidelines to assist them in their decisions, and not all keywords were compatible with the controlled vocabulary terms already observed by Oliveira et al.[38] and Freitas and Dal'Evedove.[39]

Conclusions

This investigation provides important results about how authors assign keywords, how they choose keywords that are more specific and pertinent to the object and purpose of the research, and how keyword ordering is guided by the conceptual function the keywords represent. Moreover, this study found that authors were aware that keywords are important for visibility and retrieval, and that they kept this in mind while selecting keywords. In general, participants were unaware of controlled vocabulary and its vocabulary control function prior to self-archiving, and they had no guidance on controlled vocabulary use and function. These results provide further research directions in investigating content representation in hybrid information systems, aimed at making high-quality open scholarly resources available.

The Individual Verbal Protocol provided personalized results by revealing the cognitive manifestations of each participant while selecting keywords. The immersive and introspective analysis of the procedures employed by the authors in choosing keywords for their theses and dissertations reveals a scenario of discussion and guidelines that help institutions and professionals to improve the quality of subject metadata and support the author in assigning keywords.

This study concludes that author keyword assignment was guided by concepts fundamental to the representation of the meaningful content of the text, and that keywords were ordered based the main theme of the research, as well as an awareness of the need for visibility and retrieval.

Finally, this study's results show that authors act as domain expert indexers, but are unaware that keyword assignment is an indexing process that requires representation by controlled vocabularies. To this end, the study recommends that self-archiving systems include tutorials on keyword assignment with vocabulary control without requiring authors to exclusively use controlled terms. Keywords tend to represent more specific subjects within

the sciences while the indexing terms of a controlled vocabulary tend to be more stable and connect to broader subjects. Keywords and controlled vocabulary indexing terms are complementary and neither should be used exclusively. The better option is a hybrid information representation and retrieval system which allows keywords and controlled vocabulary indexing terms to coexist.

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Appendix A. Introduction to the Verbal Protocol Technique

Procedures: Through the Verbal Protocol, we will observe the patterns and strategies used by the authors while performing subject indexing of keyword assignment to their final graduate papers in the São Paulo State University (UNESP) Institutional Repository. The research volunteers are students from the Graduate Programs in Human and Social Sciences at the Faculty of Philosophy and Sciences (FFC) of UNESP, Marília, who defended their theses or dissertations and are in the process of self-archiving their paper in the UNESP Institutional Repository.

Instructions to authors: The Verbal Protocol (VP) is the data collection technique used in our research. We will be recording this moment. The VP technique consists of the author "thinking aloud" the procedures being carried out, that is, verbalizing the procedures being carried out, in our case, at the moment of self-archiving the thesis/ dissertation in the UNESP Institutional Repository. We highlight that your personal data will be kept confidential, and only the data concerning the research will be used. You will be sent the Informed Consent Form (ICF) of the research, with the researchers' signature, informing about the research, for your authorization.

Appendix B. Specific Notes for Transcribing the Interviews*

italics: author's vocalization

( ): researcher's questions or comments

….: short pauses

…~~: long pauses

(…): omission of a passage that is not relevant in the transcription of the interview

((RI)): author's or researcher's laughter

((RM)): author's or researcher's tone of irony

"…": author's or researcher's paraphrase

{…}: excerpt from the base text† verbalized by the author

[ ]: inclusion in the transcriptions, of description of the author's significant gestures or the researcher's analytical comments

MAYBE: keywords discussed or assigned by the authors to the theses and dissertations

Underlined: specific passage that demonstrates the studied phenomenon

* Adapted from original notes for verbal protocols transcription by Marilda do Couto Cavalcanti, "*Reader-text interaction: aspects of pragmatic interaction*" (Campinas: UNICAMP Press, 1989).

† The base text refers to the information contained in the form used by the authors to self-archive the thesis/ dissertation/ in UNESP Institutional Repository.

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Study on the Realization of Information Rights of University Library Users from the Perspective of Smart Service Quality Evaluation

Xiaojun Xu and Guanghui Cheng

The purpose of this study is to explore the realization of users ' information rights (IRs) in the smart service of university libraries. Based on the LibQUAL model, principal component analysis (PCA) is used to measure the quality of smart services in university libraries. The contribution weight of various services to the realization of IRs is calculated by analytic hierarchy process (AHP), then the degree of IR realization is obtained. Users have the highest right to express information, the lowest right to equality, and other rights tend to be moderate. Suggestions to improve the realization of IRs are put forward at the end.

Introduction

Citizen's information right (IR) has become the basic right of every citizen in modern society. The protection of citizen's IRs has been paid attention to by governments in recent years (Peled and Rabin, 2010). The Chinese constitution clearly states that every citizen has the right to know, the right to express, and the right to intellectual property, all of which belong to the scope of IRs. The reform program promulgated by the European Union in 2012 also gives citizens a new IR: "the right to be forgotten," which gives citizens the freedom to halt the dissemination of their own information on the Internet (Rosen, 2012). In 2016, the U.S. government made changes to the Freedom of Information Act to further improve the relevant legal provisions (Jay Wagner, 2021). These government measures seek to protect citizens' control and use of information resources in the Web 3.0 era. From the perspective of institution building, these initiatives are the basis for improving the public cultural service system in society. As the most important public cultural service institution, the service quality of public libraries is directly related to the degree of users' IR realization. Especially, university libraries have strong knowledge service functions, and the lack of IRs will negatively affect the efficiency of academic research. In addition, the value return of information cannot be realized in the process of information flow. However, the process of IR realization is the process of objective things acting on the subject's perception, which is more subjective and there is no specific measurement standard. When users perceive that their information needs are satisfied, their

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IRs are guaranteed. Therefore, finding a measuring scale for the degree of IR realization can provide a more scientific reference for university libraries to improve the user right protection mechanism (KC, 2023).

Service is the process of interaction between libraries and users in order to meet user needs, and its most basic purpose is to meet users' information needs (Claude, 2002). The purpose of service is the necessary conditions for the realization of IRs, and high quality of service can reflect the degree of users' IR realization, so the evaluation and assessment criteria of library service quality can be used as a tool to quantify the degree of users' IR realization. This is the theoretical premise of this study (Metzl, 1996).

At present, university libraries have realized the upgrade from traditional service to smart service. Smart service refers to the combination of information technology with innovative concepts to integrate and upgrade various systems and services of libraries, to improve the efficiency of resource utilization, and to optimize the management and service of libraries (Shi, 2019). Smart service is based on traditional service and has the characteristics of traditional service, so the evaluation of the quality of smart services can rely on the evaluation methods of traditional library service (Samek, 2014).

This study will reorganize the service quality evaluation questionnaire based on the core questions of the LibQUAL questionnaire, aiming to accurately reflect the content of users' IRs. In addition to adjusting the questionnaire questions, it is necessary to redefine the evaluation dimensions, mainly using the method of principal component analysis (PCA). The division of evaluation dimensions is based on the specific type of service that users can perceive. Using specific service types as the basis for dimensionality reduction allows experts to judge more clearly the contribution weight of various types of services to the realization of IRs (Abdi and Williams, 2010).

After finding the service quality evaluation score of university libraries, how is it possible to establish the logical relationship between the service quality score and the degree of IR realization? There are various types of IRs, and the realization of each type of right is not reflected by only one kind of service content. Rather, there are various types of IRs intersecting with various kinds of service content, and each type of right requires multiple services to cooperate for its successful realization. Therefore, the key issue of measuring the degree of right realization is to compare the importance of different services in the process of right realization, that is, to calculate the proportion of contribution of each type of service to the realization of rights. The analytic hierarchy process (AHP), which measures the relative importance between criteria that are difficult to quantify through the empirical judgment of decision makers (Vaidya and Kumar, 2006), is suitable for the abstract concept of IR.

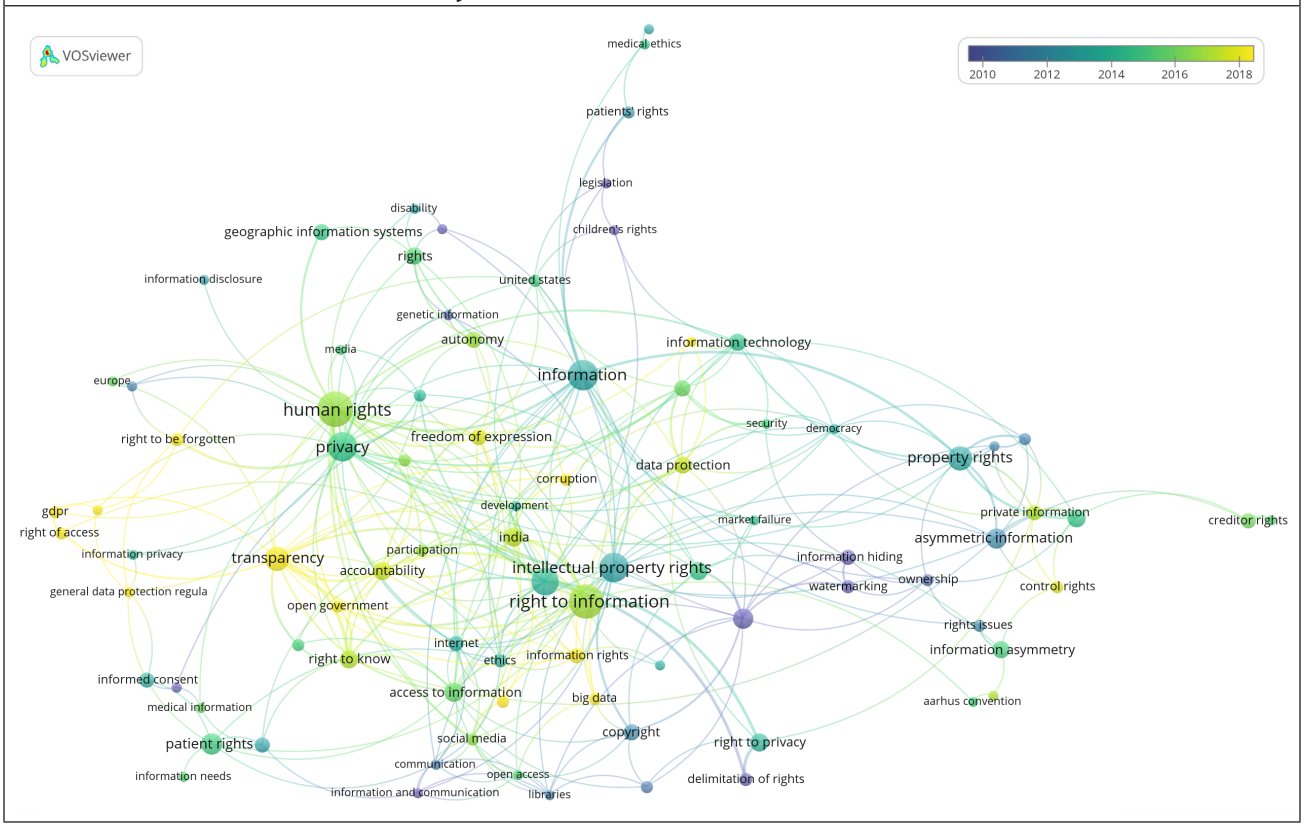
In summary, the research idea of this paper is to evaluate the quality of smart service of university libraries based on the LibQUAL questionnaire, to determine the scores of each type of service through PCA, and use AHP to determine the weight of contribution of each type of service to the realization of each type of IR. This study seeks to find the degree of users' IR realization and to provide reference for the construction of library users' right protection mechanism.

Literature Review

The study of IR is based on information ethics (Ess, 2006). Information ethics refers to the ethical requirements, ethical guidelines, ethical statutes involving information development, information dissemination, management and utilization of information, and the new ethical

relationships formed on this basis. With the development of information technology, the research content of IR has been expanded (Mathiesen, 2004). Figure 1 shows the co-occurrence network of keywords in the Web of Science core collection database containing the keyword "information right." The node size indicates the frequency of keyword occurrence, and the connecting line indicates the relationship of keyword co-occurrence in the article, and the color indicates the average year of keyword occurrence (van Eck and Waltman, 2010).

FIGURE 1
Keyword Co-occurrence Network



An analysis of the keyword co-occurrence network shows that the current research on IR has gone through three stages of development: information intellectual property, information security, and information transparency (Moore, 2005).

Information ethics is the philosophically grounded counterpart of computer ethics (Floridi, 2006), which aims to address the disparity in human right treatment brought about by the digital divide (Floridi, 1999). IR is a legal concept generated by information ethics for the protection of the right and interests of information subjects (Kitch, 1980), and the background of its emergence is that information resources have become a crucial factor of production in the internet era. Therefore, the protection of the added value of information is the beginning of IR research.

Changes in the rules of information dissemination have changed the benefits of information production in a systematic and predictable manner, and information intellectual property right is patent protection for laborers who create information value (Benkler, 2002). As people's natural property right should not be sacrificed for the sake of promoting technological innovation and realizing social benefits, information intellectual property right is supposed to serve as a reward for the laborers who create information value (Spinello, 2003). After the value of

information has been fully affirmed, how to protect the security of information has become the focus of research. The development of the internet has increased the speed of information dissemination but also increased the risk of information leakage (Kruck et al., 2002; Queiroz and de Queiroz, 2010). The privacy of personal information in this context has become the most basic IR (Acquisti, 2004). In the process of social interaction, how to meet the simultaneous needs of maintaining privacy and revealing personal information is the key issue of research (Milberg et al., 1995), and the solution to this problem should start from both legal (Zhang, 2014) and user awareness (Benson et al., 2015). With the development of big data, users play an increasingly significant role in the interaction of information service and raise higher requirements for information transparency, so users' right to know, express and use information resources are also included in IRs (Schudson, 2015).

With the expansion of the connotation of IRs, the theoretical framework has basically taken shape. More scholars began to focus on the practical research of IRs. For example, Srivastava (2010) analyzes the right to information-related laws in India and concludes that guaranteeing citizens' right to information is conducive to reducing public corruption and the gap between rich and poor (Srivastava, 2010). Alkhalidy et al. (2021) find that the right to know is not fully guaranteed in Arab countries due to the prevalence of a culture of secrecy (Kamel Jomaah Alkhalidy and Binti Abdul Halim, 2021). In addition to examining IRs in each country or region, scholars have also focused on different social agents, such as government departments (Dan et al., 2022), individual businesses (Yankovskaya et al., 2019), public libraries (Okuonghae and Obadare, 2020), and so on. Libraries, as important information service institutions in society, are the most important object of research (Alfino and Pierce, 1997). However, most of the existing studies have analyzed the information ethical behavior of staff from the library perspective, and the methods are mostly deductive and inductive, lacking data support (Fallis and Einar Himma, 2007; Ferguson et al., 2016).

There has also been research on enriching the connotation of IR from point to point and applying IR protection to social practice, which provides an important reference for the improvement of the IR guarantee system. When libraries are the focus of this kind of research, the methods of right protection finally point to the improvement of library service. In other words, service is the way to realize the right of library users. Therefore, it is feasible to measure the degree of IR realization from service quality, and it can fill the research gap of examining IRs from the perspective of users' perceptions.

An adequate understanding of IR should be approached from a jurisprudential perspective because IRs are essentially a legal bundle of right with information as an object, which has the dual functional advantages of explanatory and institutional nature as a type of right (Roberts, 2010). From a jurisprudential point of view, IR can be defined as:

> a legal right type that takes information satisfying certain conditions as the object of the right, and it is a legal right bundle composed of several sub-rights. These sub-rights include the right to information property, the right to know, the right to information privacy, the right to freedom of information dissemination, the right to information environment, and the right to information security (Singh, 2010).

If IRs are included in the social ideology, IR can be defined as an institutional arrangement chosen by a democratic government to guarantee citizens' rights relating to information (Raju, 2006).

The social responsibility assumed by IRs in the current digital environment is even more significant (Murthy and Murthy, 2022). IRs in the digital era are concentrated on the two key aspects of access to and distribution of information resources, and the claims of IR are specifically expressed as the right to access information opportunities, the right to use information technology, the right to distribute information resources, and the right to freedom of personal information (Jenkins and Goetz, 2010). The basic principles of IR protection based on right expression can be summarized as the principles of non-discrimination, skewness, and balance of interests (Janssen, 2012). Based on these principles, more diverse classifications of users' IRs can be made. The more conventional classifications include the right to information access, the right to information equality, the right to information choice, the right to information participation, and the right to information security (Roberts, 2001). This classification is based on previous scholars' research on the content framework of IRs and is combined with legal and social ethical and moral requirements (Darbishire, 2010).

The right to access information refers to the user's right to access necessary information in the process of experiencing smart service; the right to information equality refers to the user's right to use all kinds of information and resources in the library without being treated differently by the library; the right to use information technology refers to the user's right to use the means and media for accessing information; the right to use information resources refers to the user's right to use documents and data provided by the library for academic research or related normative benefits; the right to information privacy means that the personal information provided by users to the library should be legally protected; the right to information expression means that users have the right to ask questions to the library to ensure the orderly implementation of library service (Bhattacharyya, 2014).

This paper subdivides the IRs of university students, teachers, and scholars, taking into account the social identity and main responsibilities of university libraries. Considering there is no more authoritative concept of IR content for such groups in academia, the scope of IRs in this paper is defined as right of access to information, equal right to information, right to use information technology, right to use information resources, information privacy right, and right to express information, taking into account the research contents of IR by the authors of the above literature and the current situation of smart service contents of university libraries (Singh, 2012).

Research Methodology

LibQUAL Model

LibQUAL is a survey tool of service quality developed by the Association of Research Libraries. It is an online web-based survey in the form of a questionnaire with 22 core questions that measure users' perceptions of service in three dimensions: effect of service, information control, and library as place. The LibQUAL survey has been successfully implemented in libraries in 35 countries. Therefore, the LibQUAL questionnaire can be used as the basis for service quality assessment in this study (Greenwood et al., 2011).

However, there is a clear disconnect between the original content of the LibQUAL questionnaire and the purpose of this study, which is mainly reflected in the following aspects.

In terms of service form, the investigation of service effectiveness in LibQUAL is reflected through offline interpersonal behavioral interaction, especially the personal behavior of librarians; however, the development of information technology has currently enabled librarians to

shift their work form from offline to online (Vijayakumar and Vijayan, 2011). LibQUAL does not fully take into account such changes in communication methods and communication media.

In terms of service content, besides providing basic library service such as book searching, reading, and lending, university libraries should also focus on subject service such as printing, online public access catalog (OPAC), literature retrieval, electronic information resources, etc. The content of subject service is considered in LibQUAL, but due to the differences of the university management system, these contents are not fully in line with Chinese users' behavioral habits in . Further, the object of this study is primarily smart service, and there are great differences in resource contents, service methods and evaluation criteria (Cao et al., 2018).

In terms of survey purpose, the purpose of LibQUAL is to enable libraries to better understand users' experience. However, the purpose of this study is to examine the degree of users' IR realization through service quality scores, which requires formulating questions to both highlight the right realization, and to generate a certain degree of psychological implication with the subjects so that they can form an image perception of the content of IRs in the questions.

Based on the core content of LibQUAL model, it is possible to make a more accurate evaluation of the quality of smart service of university libraries. The results of adjusting the questionnaire questions according to the behavior habits of users in China (Su and Li, 2021), the characteristics of smart service of university libraries, and the connotation of IRs are shown in Table 1 (Zhang, 2021; Zhao, 2020).

Principal Component Analysis (PCA)

PCA is a multivariate statistical method that uses the idea of "dimensionality reduction" to transform multiple indicators into a few composite indicators, where the composite indicators are the principal components. Each principal component is a linear combination of the original variables, independent of each other, and retains most of the information of the original variables. The essence of this method is to seek a comprehensive substitute for the relevant variables through the correlation of the original variables, and to ensure that the information loss in the transformation process is minimized. Based on this principle, the improved evaluation indicator system can be re-dimensioned by PCA, and more specific dimensions can be used to explain the content of smart services of university libraries. In order to facilitate the experts for the weight of IRs in various types of services, this study gives up the abstract evaluation dimensions in LibQUAL but hopes to summarize the content of the main service in the university library smart service with evaluation dimensions.

Analytic Hierarchy Process (AHP)

AHP is a combination of quantitative and qualitative weight calculation method. The advantage of this method is it gives a relatively objective weight to the unmeasurable variables through systematic comparison (Saaty, 1987; Samek, 2014). According to the nature of the problem and the total goal to be achieved, AHP breaks down the problem into different constituent factors, and then gathers and combines factors at different levels according to their interrelated influence and affiliation. This creates a multi-level analysis structure model, so that the problem finally boils down to the determination of the relative importance weights of the lowest level (solutions, measures, etc. for decision making) relative to the highest level (total goal) or the ranking of relative advantages and disadvantages.

TABLE 1
Indicator Improvement Process

LibQUAL Dimension	Indicator	Adjusted Indicator
Service Effectiveness	Employees who instill confidence in users.	Users' personal browsing history and other information is protected.
	Employees who are consistently courteous.	
	Willingness to help users.	When users log in to the lending system, they can push relevant books and magazines to them through their lending records.
	Readiness to respond to users' questions.	Consulting service can be independent of time and space.
	Employees who have the knowledge to answer user questions.	AI computer customer service can meet most of the needs of users.
	Employees who deal with users in a caring fashion.	Provide effective orientation service to familiarize users with smart devices in the library.
	Employees who understand the needs of their users.	You can regularly send users information about the library's recent new book announcements, borrowing status, lecture activities, etc.
	Giving users individual attention.	Ability to push information resources of interest to users.
	Dependability in handling users' service problems.	Security assurance when logging in to "My Library."
Information Control	Making electronic resources accessible from my home or office.	Mobile OPAC service (Library Public Access System) is able to cover all types of groups in need within the university.
	Modern equipment that lets me easily access needed information.	
	The printed library materials I need for my work.	Self-service book loan service.
	The electronic information resources I need.	Construction of the library's own resource base: subject knowledge base, intelligence knowledge base, think tank, etc.
	A library Web site enabling me to locate information on my own.	Online reading and retrieval of digital resources.
	Easy-to-use access tools that allow me to find things on my own	The library's knowledge service can meet the specialized and customized needs of users.
	Making information easily accessible for independent use.	Self-service book return service.
	Print and/or electronic journal collections I require for my work.	Library knowledge service can meet the professional learning, research, and teaching needs of faculty and students.

TABLE 1
Indicator Improvement Process

LibQUAL Dimension	Indicator	Adjusted Indicator
The Library As a Place	Library space that inspires study and learning.	Self-service support service: application for certificates, documents and printing, payment of fees, etc.
	Quiet space for individual activities.	Applying intelligent robots to help users with information queries.
	A comfortable and inviting location.	Online consulting platform construction service is comprehensive.
	A getaway for study, learning, or research.	Library website with a clear menu of features and guided tours.
	Community space for group learning and group study.	Self-service leisure service: telephone, vending machine, audio-visual experience, etc.

The degree of contribution of each type of service to the realization of IRs is one such variable that is difficult to measure directly, and therefore the contribution weight of each type of service to the realization of IRs can be assessed using AHP.

Smart Service Quality Evaluation

Questionnaire Design and Data Collection

At present, the smart service construction of university libraries in Hebei Province, China is at a medium development level compared with universities in other Chinese provinces. The existing service with high popularity includes the construction of special digital resources, online reference consultation service, online electronic library journals, inter-library loan and document delivery, navigation service, and platform mobile service. At present, most universities in Hebei Province have formed a more complete smart service system (Han and Quan Liu, 2010). At the same time, the distribution of the development of smart services in the libraries of various universities in Hebei Province is more balanced, and the gap among the universities is not very large, so the distribution characteristics can further ensure the accuracy of the data collected by the questionnaire (Si et al., 2011).

The questionnaire consists of two parts: one is the basic personal information of users, including gender, age, identity, etc.; the second is the part of users' service quality evaluation of university library smart service, which sets 20, five-level Likert scale questions. Users score their satisfaction with each indicator in each dimension according to their own experience and feeling about the university library smart service, and the satisfaction is divided into "very dissatisfied," "dissatisfied," "average," "satisfied," and "very satisfied." In the scale, "1" means "very dissatisfied," and "5" means "very satisfied." The number changes from "1" to "5" indicates the incremental relationship of satisfaction.

Distribution of Questionnaires

The questionnaires were distributed virtually to students, teachers, and researchers in general full-time universities in Hebei Province from August 2021 to October 2021. We ensured that all participants were anonymous and at no risk.

The questionnaire used a random sampling method, and the survey sample covered all age groups and identities. The age distribution of users was mainly 18-50 years old, accounting for 84.89% of the total sample size, and 50-70 years old accounted for 15.11% of the total sample size. The proportion of males was 56.47% and 43.53% of females. Students made up 44.24% of respondents, teachers were 42.47%, and the remaining 13.29% of respondents were full-time researchers. According to the configuration of various groups within the university, the sample oriented by this questionnaire has good representativeness and can be used to illustrate the general characteristics of users when they are oriented to the smart service of university libraries and to ensure the objectivity of the analysis of the survey results.

Reliability and Validity Analysis

Reliability tests were performed on the collected questionnaire data, and the Cronbach alpha coefficient based on standardized items for this group of data was obtained as 0.891, indicating that the questionnaire is highly reliable and that the scale data have good stability.

TABLE 2
Reliability Test

Cronbach Alpha	Cronbach Alpha Based on Standardized Items	Number of Items
0.890	0.891	20

The content validity test of this questionnaire was chosen to use KMO value and Bartlett's sphericity test. The final KMO value was 0.738, and the *p*-value in Bartlett's sphericity test was significantly less than 0.05, indicating that the overall content validity of this questionnaire is high and that the settings of each individual item can effectively express the information of the corresponding variables.

TABLE 3
Content Validity Test

Kaiser-Meyer-Olkin (KMO)		0.738
Bartlett's Sphericity Test	**Approximate Chi-Square**	3621.194
	Degrees of Freedom	190
	p	<0.001

Dimensionality Reduction Process

If there is a correlation between variables, direct inclusion in the analysis may not lead to correct conclusions due to multivariate covariance. A linear combination of the original 20 indicators was made as a new composite indicator, and this composite indicator is a principal component. In order to maximize the amount of information contained in each principal component, the maximum variance method was used for PCA. That is, the larger the variance value of each linear combination, the more information it contains. The total variance explained after the analysis by SPSS is shown in Table 4.

The eigenvalue is an indicator of the influence strength of the principal component, representing the amount of information of original variables that can be explained on average after the introduction of this principal component; generally the eigenvalue is required to be > 1. The explained variance ratio indicates the proportion of the variance of the principal

TABLE 4
Total Variance Explained

Components	Initial Eigenvalue			Extraction of the Sum of Squares of Loadings		
	Total	Explained Variance Ratio	Cumulative %	Total	Explained Variance Ratio	Cumulative %
1	6.952	34.761	34.761	6.952	34.761	34.761
2	1.886	9.429	44.190	1.886	9.429	44.190
3	1.643	8.215	52.405	1.643	8.215	52.405
4	1.446	7.228	59.633	1.446	7.228	59.633
5	1.263	6.315	65.949	1.263	6.315	65.949
6	1.028	5.319	71.088	1.028	5.319	71.088
7	0.882	4.408	75.496			
8	0.799	3.996	79.492			
9	0.744	3.722	83.214			
10	0.676	3.381	86.595			
11	0.563	2.813	89.408			
12	0.447	2.237	91.645			
13	0.344	1.719	93.364			
14	0.319	1.593	94.957			
15	0.248	1.241	96.198			
16	0.195	0.976	97.174			
17	0.181	0.907	98.081			
18	0.154	0.770	98.852			
19	0.127	0.635	99.486			
20	0.103	0.514	100.000			

component in the total sample variance, and the larger the value, the greater the amount of information of the original variables carried. The cumulative explained variance ratio refers to the explained cumulative ratio of the first *k* principal components. This is how much original information is extracted from the first *k* principal components in descending order of explained variance ratio. Based on the size of the eigenvalues, it is determined that the original variables should be divided into six dimensions, and the cumulative explained variance ratio is more than 70%, which can better explain the information in the original variables.

After determining the number of principal components, the classification of indicators is determined by factor loading. Factor loadings indicate the importance of indicators in the principal components with 0.5 or more indicating that the indicators are suitable for subordination to that principal component. Results of the classification are shown in Table 5.

After the dimensionality reduction of the indicators, each principal component is named according to the content of the indicators. The purpose of PCA is to outline the content of smart services in university libraries, and various division methods have emerged in academia for the specific content of smart services. The functions of libraries can be divided into four parts: resource service, knowledge service, connection service, and value-added

TABLE 5
Factor Loadings After Rotation

	Component					
Indicator	**1**	**2**	**3**	**4**	**5**	**6**
1				0.918		
2				0.585		
3				0.649		
4				0.550		
5		0.524				
6		0.954				
7		0.790				
8		0.620				
9	0.654					
10	0.632					
11	0.802					
12			0.802			
13			0.932			
14			0.535			
15						0.637
16						0.904
17						0.701
18					0.594	
19					0.538	
20					0.534	

service (Hou, 2020). From the role played by artificial intelligence in library service, library smart service can be divided into six categories: mobile service, self-service, intelligent consultation service, personalized recommendation service, knowledge service, and intelligent navigation service (Ziming and Peng, 2015). Scholars have a high degree of consistency in the interpretation of the content of library smart service; they analyze the traditional library service from a horizontal perspective and classify the content of library smart service from the combination of information technology and library service.

Through the interpretation of the literature related to library smart service, the content of each indicator is combined. In this study, the six main components are named as: personalized recommendation service (PRS), self-service (SS), knowledge service (KS), mobile service (MS), intelligent consultation service (ICS), and intelligent navigation service (INS) (Chen and Zhang, 2016). The classification result is shown in Table 6.

TABLE 6
Evaluation Indicator System of Smart Service Quality of University Libraries

Dimension	**Code**	**Indicator**
PRS (Jing, 2021)	A1	You can regularly send users information about the library's recent new book announcements, borrowing status, lecture activities, etc.
	A2	Ability to push information resources of interest to users
	A3	Users' personal browsing history and other information is protected
	A4	When users log in to the lending system, they can push relevant books and magazines to them through their lending records.
SS (Lagerborg, 1997)	B1	Self-service book loan service
	B2	Self-service book return service
	B3	Self-service support service: application for certificates, documents and printing, payment of fees, etc.
	B4	Self-service leisure service: telephone, vending machine, audio-visual experience, etc.

TABLE 6
Evaluation Indicator System of Smart Service Quality of University Libraries

Dimension	Code	Indicator
KS (Aswath and Gupta, 2009)	C1	Construction of the library's own resource base: subject knowledge base, intelligence knowledge base, think tank, etc.
	C2	The library's knowledge service can meet the specialized and customized needs of users
	C3	Library knowledge service can meet the professional learning, research and teaching needs of faculty and students
MS (Little, 2011)	D1	Mobile OPAC service (Library Public Access System) is able to cover all types of groups in need within the university
	D2	Online reading and retrieval of digital resources
	D3	Security assurance when logging in to "My Library"
ICS (Thompson and Edelstein, 2004)	E1	Consulting service can be independent of time and space
	E2	AI computer customer service can meet most of the needs of users
	E3	Online consulting platform construction service is comprehensive
INS (Rennick, 2019)	F1	Library website with a clear menu of features and guided tours
	F2	Provide effective orientation service to familiarize users with smart devices in the library
	F3	Applying intelligent robots to help users with information queries

Smart Service Quality Score Calculation

After determining each principal component, the service quality score of each principal component needs to be calculated as the basis for calculating the degree of IR realization. First, the weight of each indicator in the principal component is calculated, then the average score of the indicators within the principal component is weighted and totaled, resulting in the service quality score of each principal component. The principle of PCA lies in information concentration. The greater the concentration of information, the greater the indicator weights can be, and it is by using this principle that the indicator weights can be calculated. The extent of information enrichment is expressed by the value of factor loading. In calculating the indicator weights, there are three steps:

1. Calculation of the linear combination coefficient (i.e. the factor loading divided by the square root of the corresponding eigenvalue). The linear combination coefficient can be used to express the magnitude of information enrichment.
2. Calculating the composite score coefficient with the formula: cumulative (linear combination coefficient * explained variance ratio)/cumulative explained variance ratio (i.e. the linear combination coefficient is multiplied by the explained variance ratio respectively, then totaled, and then divided by the cumulative explained variance ratio).
3. Calculate the importance weights and normalize combined score coefficients to obtain the weight values of each indicator.

According to the above method, the importance weights of indicators in each principal component are obtained, as shown in Table 7.

Relying on the weights of each indicator, the average values of indicators in each principal component (Table 8) were weighted and totaled to obtain the service quality scores of each dimension: 3.74 for PRS, 3.59 for SS, 3.69 for KS, 3.65 for MS, 3.59 for ICS, and 3.57 for INS.

TABLE 7
Indicator Weights

Indicators	Weighting	Indicators	Weighting
A1	14.93%	C3	34.45%
A2	24.90%	D1	24.46%
A3	35.98%	D2	29.88%
A4	24.18%	D3	45.66%
B1	24.95%	E1	47.29%
B2	25.63%	E2	27.81%
B3	23.30%	E3	24.90%
B4	26.12%	F1	38.16%
C1	32.57%	F2	34.18%
C2	32.98%	F3	27.67%

TABLE 8
Average of Indicator Measurements

Code	Mean	Standard Deviation	Number of Cases
A1	3.80	0.992	278
A2	3.38	1.005	278
A3	3.93	0.917	278
A4	3.78	0.862	278
B1	3.65	0.864	278
B2	3.58	0.903	278
B3	3.85	0.864	278
B4	3.30	1.067	278
C1	3.65	0.802	278
C2	3.55	1.061	278
C3	3.85	0.700	278
D1	3.58	0.984	278
D2	3.60	0.841	278
D3	3.73	0.905	278
E1	3.70	0.853	278
E2	3.35	0.975	278
E3	3.63	0.925	278
F1	3.55	0.904	278
F2	3.70	0.723	278
F3	3.43	1.035	278

Weighting of the Contribution of Each Type of Smart Service to the Realization of Right

After getting the quality evaluation score of smart services of university libraries, the next step is to analyze the degree of IR realization in the service.

The service provided by university libraries contains the content of IR realization, but the relationship between each service and each IR is not one-to-one because the realization of IR involves the intersection of several services. Therefore, it is necessary to determine the weight of each service's contribution to the realization of rights first.

In this study, different types of IRs are analyzed separately using AHP, and the importance of various smart services under each IR is compared two by two. Then, a judgment matrix is constructed, from which the contribution weights of the compared service types to the realization of rights are calculated and tested for consistency. The weights obtained in this way are shown in Table 9.

TABLE 9
Weight of Contribution of Each Service to the Realization of IRs

Type of IR	Smart Service Dimension	Contribution weighting	Type of IR	Smart Service Dimension	Contribution weighting
Right of Access to Information	PRS	0.11	**Right to Use Information Resources**	PRS	0.06
	SS	0.15		SS	0.08
	KS	0.33		KS	0.29
	MS	0.20		MS	0.28
	ICS	0.09		ICS	0.15
	INS	0.12		INS	0.14
Equal Right to Information	PRS	0.11	**Information Privacy Right**	PRS	0.22
	SS	0.13		SS	0.18
	KS	0.10		KS	0.12
	MS	0.13		MS	0.17
	ICS	0.26		ICS	0.23
	INS	0.26		INS	0.09
Right to Use Information Technology	PRS	0.05	**Right to Express Information**	PRS	0.13
	SS	0.19		SS	0.13
	KS	0.11		KS	0.16
	MS	0.28		MS	0.10
	ICS	0.22		ICS	0.35
	INS	0.15		INS	0.15

IR Realization Score

The service quality evaluation scores of various types of smart service in university libraries and the contribution weights of each service to the realization of IRs were obtained by combining the above studies. The following formula was used in this study to calculate the realization degree of each type of IR:

$$A_j = \sum_{i=1}^{6} E_i C_i$$

Where A_j denotes the realization degree of various IRs, E_i denotes the evaluation score of each dimension of smart service, and C_i denotes the contribution weight of each dimension of smart service to the realization of various IRs. The relational operation can place the IR realization score and the user's evaluation score of the university library smart service under the same dimension, with a minimum score of one and a maximum score of five, indicating the increasing relationship of the realization degree of right. The right realization scores of various IRs in all dimensions are summed up to obtain Table 10.

TABLE 10
IR Realization Score

Type of IR	Right Realization Score
Right of Access to Information	3.647
Equal Right to Information	3.581
Right to Use Information Technology	3.621
Right to Use Information Resources	3.641
Information Privacy Right	3.677
Right to Express Information	3.697

Using the final obtained scores of the realization degree of various types of IRs, we can analyze the status of guaranteeing users' IRs in the process of smart service of university libraries. In general, the users' IRs are well protected, and none are neglected, which means that libraries should pay attention to all kinds of IRs. However, this also means that there is no one prominent type of IR that makes users particularly satisfied, and there is still a lot of room for upward movement overall. The IR type with the highest degree of right realization is "right to express information." This shows that the process of smart service construction in university libraries has fully considered users' opinions and suggestions and has also given them more space to express themselves. This is also evidenced by the rising trend of user research in recent years, reflecting the increasingly important position of users in the construction of smart library services. The lowest degree of realization is equal right to information. This can be attributed to the fact that it is common for universities across the country to differentiate rights of users and give them different degrees of authority for different groups. This differentiation system can effectively save money and improve efficiency; is the best way to allocate data resources in university libraries. Given that the realization of information equality right is more abstract than other types of IRs, the guarantee of such right should be more expressed in making users have a good cognitive and emotional image of library service.

Discussion

Next, this paper summarizes the six types of IRs, analyzes the advantages and disadvantages of each user's IR protection, and provides suggestions for the optimization of IR protection in the process of smart service construction.

Right to Express Information

Right to express information is mainly realized through the intelligent consultation service. The score of right to express information realization is 3.697, which is the highest compared to other types of IRs. This reflects that library management fully respects users' opinions; the intended users of university libraries have considerable ability, so the suggestions provided by users to university libraries have certain reference significance.

The most important indicator in the evaluation of users' satisfaction with the content of intelligent consultation service is, "Consulting service can be independent of time and space,"

and the indicator with the lowest score is, "AI computer customer service can meet most of the needs of users." This suggests that the libraries need to: further improve the online consultation service; fully understand the users' demands; make the users solve more problems through intelligent customer service; and improve the level of consultation service while protecting the users' right to express information.

Information Privacy Right

Information privacy right has the strongest correlation with the personalized recommendation service. Users' information privacy realization score is 3.677, which is higher than the realization of several other types of IRs, but still does not reach a level that makes users feel more satisfied overall.

At present, Chinese university libraries actively support information protection laws and social ethics and they fully respect users' information privacy right; however, this may also limit the analysis of users' preferences by smart service. The use of big data and the protection of users' personal information have been controversial in recent years, and there is no easy solution to this problem; it can only be solved by technological progress, or by the improvement of the content of privacy agreements between libraries and users.

Right to Use Information Technology

The main service content associated with the right to use information technology is self-service. At present, Chinese users' use of the equipment is limited to lending books, and the level of utilization of equipment functions is low. If the level of interaction between the technical information involved in the self-service process and the users can be improved, it can not only further guarantee the realization of users' rights to use information technology, but also improve user satisfaction with the self-service.

Right of Access to Information

The right of information access is the basic guarantee for users to exercise their IRs. To fully guarantee users' IRs in the process of smart service construction, university libraries should strive to improve the content system of knowledge service, which is not only the basic function of university library service, but also an important content for users to effectively exercise their IRs.

Right to Use Information Resources

Knowledge service and mobile service have the strongest correlation with the right to use information resources. Knowledge service provides an information resource repository and mobile service provides access, and both are indispensable to guarantee users' right to use information resources together.

Equal Right to Information

The intelligent navigation service contributes a high weight to the realization degree of users' equal right to information. The degree of acceptance of the smart service system varies among different groups due to their knowledge, age, and other factors. To further improve users' equal right to information through intelligent navigation service, it is necessary for university libraries to ensure the accuracy and clarity of intelligent navigation service while focusing

on the improvement of database resources. This requires university libraries to use targeted guidance service when weighing different groups. To realize users' equal right to information, improving the intelligent navigation service is a key process that needs to be developed based on technologies and oriented to the characteristics of user groups.

Conclusion

The service quality of university library smart service in mainland China is good. Users have the highest degree of information expression right realization and the lowest degree of information equality right realization. Information access, information technology use, information resource use, and information privacy rights tend to be moderate in the process of receiving university library smart service; however, there is still much room for upward movement overall.

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Library Terms that Users (Don't) Understand: A Review of the Literature from 2012-2021

Courtney McDonald and Nicole Trujillo

This paper compares website usability—specifically library users' understanding of library terms—for fifty-one original research studies between 2012-2021, with the findings of John Kupersmith's 2011 white paper "Library Terms That Users Understand." Studies reported approximately twice as many terms that users didn't understand than terms users did understand, with some terms appearing in both categories. Analysis of the findings suggests a majority of Kupersmith's guidelines remain applicable to today's online environment, with some adjustments related to technology advances. We propose an additional guideline that acknowledges the role non-library websites play in guiding how users interact with library terminology.

Introduction

Naismith and Stein observed in 1989, "as is true with many professions, librarianship employs many words and phrases that can be considered technical language."[1] To describe library operations, services, resources and workflows, library and information professionals have developed jargon, or specialized vocabulary, hereafter referred to as "library terms." These terms include phrases such as "call number" that are used in many libraries, and specific names adopted within individual libraries and library systems, such as naming a library catalog or search. Users of libraries may not be familiar with these library terms, negatively impacting their use of library services and resources.

John Kupersmith iteratively revised and published a white paper summarizing best practices for using library terms, originally gleaned from findings of library usability research published between 1997 to 2008. He later included studies published from 2009 to 2011.[2] His paper presented seven best practices:

1. Test to see what users do and don't understand and what terms they most strongly relate to.
2. Avoid—or use with caution—terms that users often misunderstand.
3. Use natural language equivalents on top-level pages.
4. Enhance or explain potentially confusing terms.
5. Provide intermediate choices when a top-level menu choice presents ambiguities that

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can't be resolved in the space available.
6. Provide alternative paths where users are likely to make predictable "wrong" choices.
7. Be consistent to reduce cognitive dissonance and encourage learning through repetition.[3]

Acknowledging the enduring usefulness of Kupersmith's white paper, as well as the significant changes in both user interfaces and user expectations since 2011, we wished to provide updated results for library practitioners and library web developers, including a review of whether Kupersmith's summary findings still hold true. In this paper we present an analysis of original research studies conducted between 2012-2021 with findings related to library users' understanding of library terms, and compared these findings with Kupersmith's work.

Research Questions

R1: Have there been changes over time in types of organizations represented, in research questions, or in methodology?

R2: What library terms do users understand?

R2.1: What terms do users not understand?

Literature Review

Usability Research in Libraries

The well-known user experience (UX) consulting firm, Nielsen Norman Group, defines "usability" as, "a quality attribute that assesses how easy user interfaces are to use. The word 'usability' also refers to methods for improving ease-of-use during the design process."[4] Mentions of the importance of usability and usability testing began to regularly appear in the library literature in the late 1990s.[5] By 2003, Vaughn and Callicott comment, "web site usability testing has rapidly become *de rigueur* in libraries across the country… Simple usability testing can be a fast, cheap, and effective means of Web site evaluation."[6]

Libraries' attention to usability appears to have been well-warranted. In a 2007 literature review, Blummer stated, "although many academic library web pages contain relevant resources and services, navigation [and usability] studies revealed users encountered difficulties obtaining materials and services because of the poor design of the sites."[7] Survey studies have continued to find issues with website accessibility, content, and design.

In the later 2000s concerns started to emerge about the prevalence of library usability case studies whose results were sometimes so localized as to not be broadly generalizable, with Emanuel offering recommendations in her 2013 literature review "to make [study] results applicable…beyond a single interface evaluation at one library and be generalizable across different interfaces and among different libraries."[8]

In the mid-2010s, focus shifted from a sole consideration of usability to the broader lens of UX. For example, Bell asserted that, "academic librarians should commit to a total, organization-wide effort to design and implement a systemic user experience."[9] MacDonald's interviews with UX librarians suggested that barriers to embracing this broader approach remained, including cultural resistance and resource limitations.[10] In 2020, Young et al. found that UX maturity in libraries remained in the "low-to-middle" range.[11]

Despite, or perhaps within, the ongoing shift towards a more holistic approach to overall UX, the COVID-19 pandemic renewed library interest in web usability testing. A 2021 *Ameri-*

can Libraries feature article on user-friendly websites commented: "the increased importance of library websites during the COVID-19 era has highlighted common usability shortcomings—and opportunities."[12]

Jargon and Its Impact on End-User Engagement and Understanding

Jargon is "the technical terminology or characteristic idiom of a special activity or group."[13] Though this can be a helpful shortcut for intra-organizational dialogue, many organizations have expressed their concern with using jargon in communications meant for general audiences.

The Plain Language Action and Information Network, an "unfunded working group of federal employees" directs writers to avoid jargon, saying: "readers complain about jargon more than any other writing fault, because writers often fail to realize that terms they know well may be difficult or meaningless to their audience."[14]

Likewise, the Nielsen-Norman Group advocates for clear straightforward writing which, "communicates information succinctly and efficiently so that readers understand the message quickly, without having to decipher complicated sentences or vague jargon."[15] Usability consulting company UserTesting pointed to the damaging effect of jargon on customer experience, saying, "use of jargon can impair clarity, and can be isolating and/or condescending to the reader."[16]

A large-scale study of U.S. readers' comprehension of technical writing presented with and without jargon terms found that, "simply providing definitions or explainers alongside technical language will not reduce the negative effects of jargon use. Instead, practitioners should remove jargon—or other forms of technical language—where possible."[17]

Library Terms (Jargon) and Usability

Naismith and Stein's 1989 study, testing student comprehension of library terms, issued a strong warning:

> Although each profession has its share of jargon, librarianship is such a heavily user-oriented field that any indication of a lack of communication should be given serious attention. The results reported here indicate clearly that there is a communications problem between librarians and patrons. Librarians cannot rely on the patrons to decipher a meaning from the context.[18]

Interest in various questions related to user comprehension of library jargon appeared as a distinct thread in the library literature related to usability in the 1990s and early 2000s.[19]

Kupersmith's aforementioned meta-analysis, "Library terms that users understand," analyzed and presented the results of original research studies published between 1997 and 2008 focusing on those "evaluating terminology on library websites, and suggest[ing] test methods and best practices for reducing cognitive barriers caused by terminology."[20]

In 2012, Majors conducted a usability study of multiple discovery interfaces, and stated: "it is clear that in some areas the library could adopt different public-facing terms that might more clearly suggest to patrons what is meant."[21]

In a 2017 content analysis of signage, websites and documents for four New Zealand public libraries, Fauchelle concluded, "while jargon might be useful when communicating within a

discipline, it is crucial to use language that library clients easily understand."[22] Backowski et al. revised database descriptions to eliminate jargon and found that Plain Language descriptions improved participants' ability to select databases. Referencing "equity and usability" as drivers, they stated, "Plain Language database descriptions offer an opportunity to practice user-centered librarianship."[23]

Methods

Search Strategy

We identified the library and information science bibliographic databases LISTA[24] and LISA[25] as key sources of professional literature. To complement the professional literature—and to include gray literature such as presentations, white papers, and other non-peer reviewed sources—we also searched Google Scholar as recommended by Haddaway et al.[26]

In order to identify as many pertinent research articles for our literature review as possible, we started with the following search structure:

LISTA (via EBSCO) and LISA (via ProQuest)

Terms:

website OR "web site" OR libguides OR site OR "online tutorial" AND librar* AND usability OR "user research" OR "user experience"

Limiter:

2012-2021

Google Scholar

Terms:

(website OR "web site" OR libguides OR site OR "online tutorial") AND (library OR libraries) AND (usability OR "user research" OR "user experience")

Limiter:

2012-2021

We limited terms to studies done on online environments to reflect Kupersmith's original goal of assisting library web developers. As Kupersmith's paper included research up to 2011, we limited the date to papers published in 2012 and beyond.

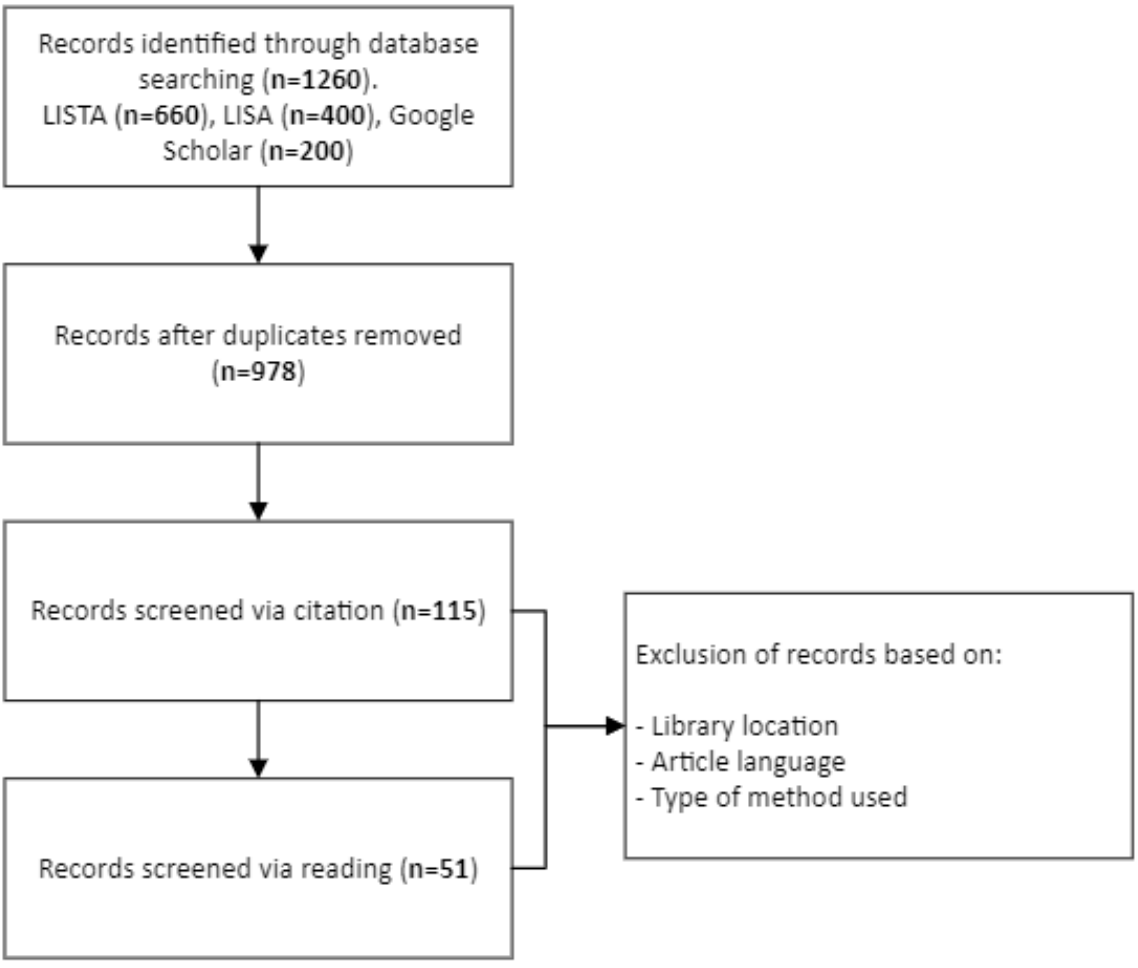
We did the searches on the same day in February 2022 and downloaded results into a shared Zotero Group Library. We added all results returned from the search queries within LISA and LISTA. Following the recommendation of Haddaway et al., we downloaded the first two hundred relevance sorted Google Scholar results.[27]

In sum, we retrieved 1260 results. After deduplication, 978 results remained (see Figure 1: Study Selection).

Screening Strategy

Once we had gathered and deduplicated the documents, we removed documents where the library location was outside North America and the language of publication was not English, as library terminology and services often have a regional element. We then closely reviewed the content of the remaining 115 papers and removed documents that did not report on an experiment involving non-librarian patrons using online library terminology, as our research questions center on directly observed user behavior and not indirect methods such as content analysis and heuristic evaluation. After we finished screening fifty-one articles met criteria (Appendix A).

FIGURE 1
Study Selection



Data Analysis

To analyze the documents, we identified specific demographics and characteristics of interest (e.g., number of participants, methods, etc.) and recorded them on a shared spreadsheet (Appendix B). We also coded Kupersmith's research in an abbreviated form so that we could compare study changes over time. We recorded article findings on a separate spreadsheet tab and assigned values indicating type of platform mentioned, library service task performed, Kupersmith guideline(s) followed, and notes.

To define "Library Service or Task," we developed fifteen categories mapped to library services or tasks, and categorized findings across all studies. This categorization was particularly helpful in analyzing findings based on library-specific themes. Most frequently covered topics were databases / journals / articles (twenty-eight), website navigation (twenty-one), instruction (sixteen) and borrowing (fifteen) (table 1). Although our search strategy did not focus on physical spaces, eight studies mentioned physical spaces in their findings. The full dataset is available to readers (https://doi.org/10.17605/OSF.IO/ZR4AB). As we took notes on the articles, we met to discuss classifications and refine meanings, recording outcomes in a data dictionary.

Findings

R1. Have There Been Changes over Time in Types Of Organizations Represented, in Research Questions, or in Methodology?

Kupersmith reports on forty-seven studies from thirty-one institutions in his table titled 'Library Terms Evaluated in Usability Tests and Other Studies.' He does not articulate his selection criteria. We examined fifty-one studies and have articulated our selection criteria in the previous section on methods.

Fifty-one institutions were represented, though there is not a one-to-one relationship between studies and institutions.

TABLE 1
Number of Studies Assigned to Each Library Service or Task

Library Service or Task Category	# Studies
Databases/journals/articles	28
Website navigation	21
Instruction	16
Borrowing	15
Discovery search	11
Research assistance	10
Books	9
Physical facilities	8
Library catalog	7
Search box	5
Item metadata	4
Citation styles & management	3
Special collections & archives	3
Datasets	2
Images	1

Types of Organizations Represented

To understand the types of organizations represented in Kupersmith and our collection of studies we compared institutions by Carnegie Control and Carnegie Classification.[28]

Carnegie Control indicates whether an institution is public, private not-for-profit, or for-profit. Carnegie Classification categorizes institutions based on number and type of degrees offered.

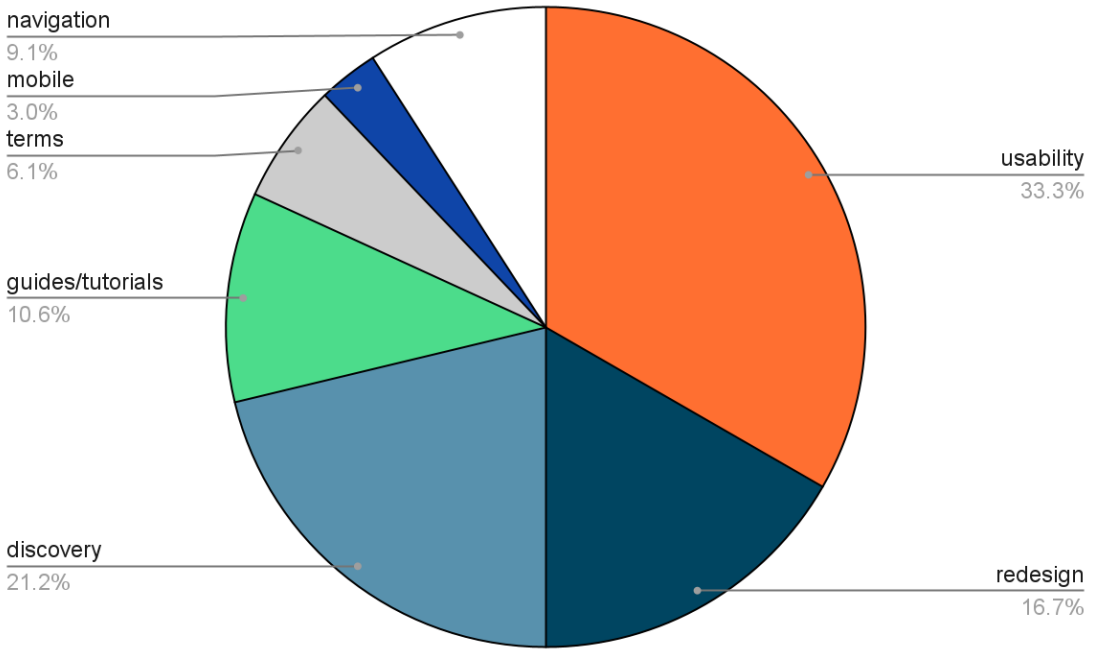
The results were not different enough to be meaningful. In both studies just over 80 percent of institutions were public with the remainder being private not-for-profit (in the current study, two percent of organizations were not institutions of higher education and thus had no Carnegie Control designation). In Kupersmith's paper, a little more than two-thirds of references originated from doctoral universities, with additional groups being Master's Colleges and Universities (16.1 percent), approximately three percent each from Associate's Colleges and Baccalaureate Colleges, and the remainder of institutions not having a Carnegie Classification. The current paper represents a very slightly greater diversity of Carnegie Classification types. Doctoral Universities still account for approximately two-thirds of the references. In addition to Master's Colleges and Universities, Baccalaureate Colleges, and Associate's Colleges, references also originated from Special Focus Four-Year and Doctoral/Professional Universities. Approximately eight percent of our references could not be mapped to Carnegie Classification because their institutions do not participate.

Neither Kupersmith's paper nor this paper includes research originating from public libraries. One study reviewed by Kupersmith was undertaken by the Minitex/Minnesota State Library Standards Review Task Force; its results report on a survey of 7651 library users, including 5021 users of public libraries, 232 K-12, and 202 "other."

Research Questions

Kupersmith did not specifically capture information related to research questions or study goals. As noted in our Methods section, we recorded various characteristics for each reviewed

FIGURE 2
Research Goals by Topic



study, including the research question or research goal. Sixteen of the fifty-one studies reviewed in this paper—approximately 30 percent—articulated a formal research question. The remainder of the studies outlined a variety of goals. Seven high-level categories emerged across all fifty-one studies (see figure 2). Some studies identified multiple topics of interest.

The most common topics of research were associated with usability inquiries, the redesign of a website or web application (before or after it took place), and the assessment of a discovery tool. Less frequently mentioned were tutorials or course/research guides, navigation/information architecture, a specific investigation of terminology, or mobile web interfaces. Frequently, the goal-based studies framed their purpose broadly as assessing usability or user preferences, or in relation to a redesign.

Number of Participants and Types of Research Methods

Looking at study methodology, we reviewed the number of participants and the number and types of user research methods.

The median and mode for number of participants for studies reviewed by this paper and studies reviewed by Kupersmith were quite comparable, as described in table 2. Mean values were not a meaningful measure due to several large outliers.

To understand the type of user research methods used in the study we plotted each method on a graph using the framework proposed by Gordon and Rohrer's 2022 article, "A

TABLE 2
Number of Participants, Comparison of Kupersmith & this Study

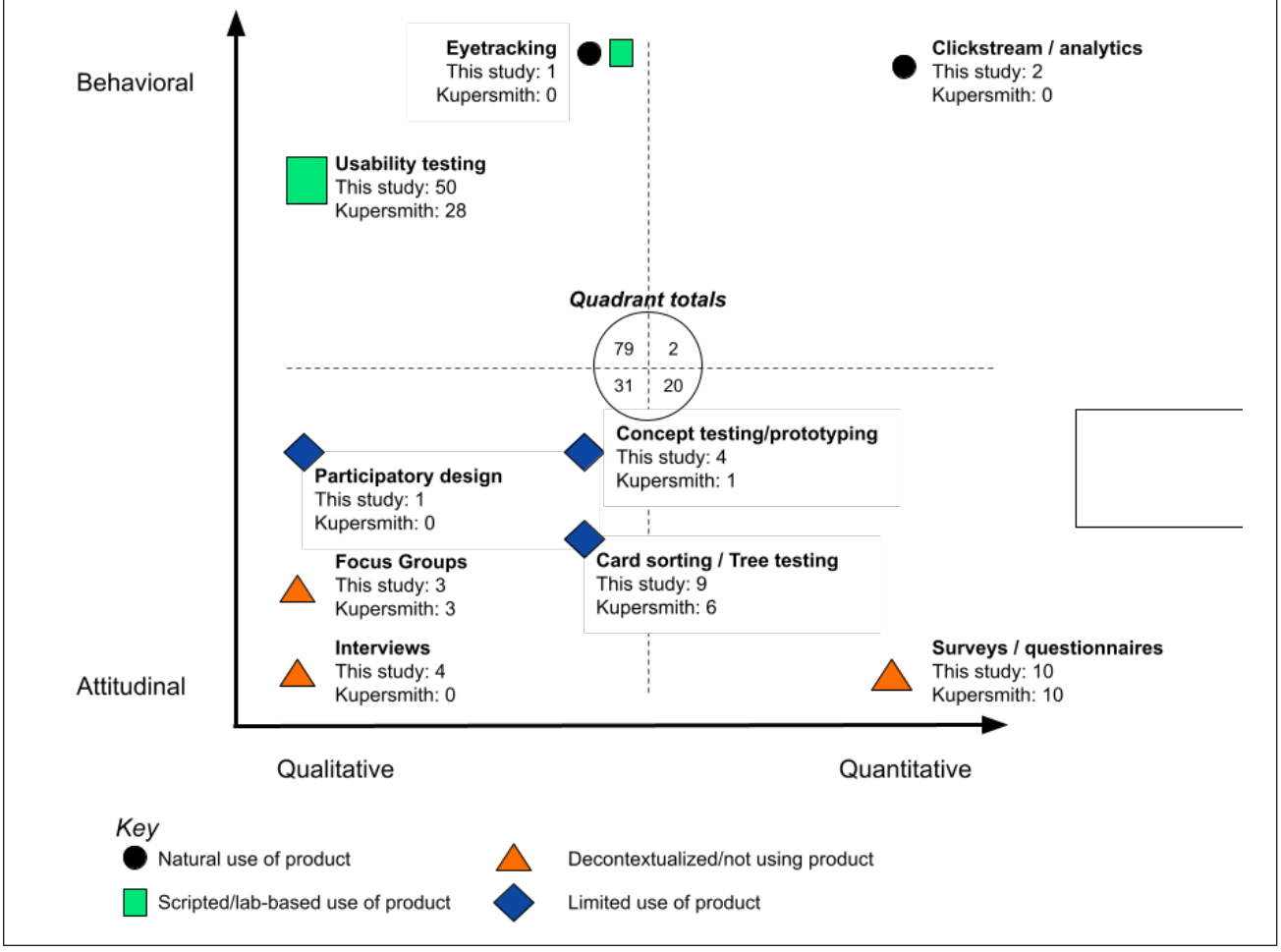
	Total Studies	Median	Mode	Mean
Kupersmith	47	15	9	224.6
This study	51	19	10	27.2

Guide to Using User-Experience Research Methods."[29] This framework identifies studies using the following dimensions:

- Attitudinal versus Behavioral: This dimension "contrast[s] what people say versus what they do."[30]
- Qualitative versus Quantitative: Qualitative methods involve direct observation and data gathering where quantitative methods make use of indirect observation and data gathering. Qualitative "methods are better suited to answering questions about why or how to fix a problem," where quantitative methods "answer how many and how much types of questions."[31]
- Context of product use: This dimension refers to whether study participants engage in a natural use of a product, a scripted/lab-based use of a product, a limited use of a product, or are not using a product and thus providing decontextualized feedback.[32]

The forty-six papers reviewed by Kupersmith reported a total of ten user research methods. Twenty-eight mentioned user observation (i.e., usability testing). Other methods were used much more infrequently: six mentions of card sorting ("a technique that involves asking users to sort information into logical groups"[33]), five each for surveys and questionnaires,

FIGURE 3
User Research Methods Reported in Kupersmith and in this Paper, Presented in Gordon & Rohrer's Three-Dimensional Framework



three for focus groups, two "link choice" studies, and one mention of prototyping. Although heuristic evaluation and design walkthrough were each also mentioned once, they are expert evaluation methods rather than user research methods and therefore do not appear in figure 3. Only three studies used two methods and just two studies reported use of four methods.

The fifty-one studies reviewed in this paper reported a total of eleven user research methods. The overwhelming favorite was usability testing with fifty mentions. Surveys were implemented by ten studies and card sorting by eight. Other methods mentioned were interviews, prototyping, focus groups, advanced scribbling (categorized as participatory design in figure 3), analytics (i.e. Google Analytics), eye tracking, transaction log analysis, and tree mapping. In seventeen studies, more than one method was used; four studies employed three methods; and three studies employed four.

As figure 3 shows, original library research reviewed in this paper and Kupersmith's paper tended heavily to the behavioral/qualitative and attitudinal/qualitative quadrants, revealing a focus on "why" and "how to fix" questions. Use of attitudinal/quantitative methods centered on surveys and questionnaires. The behavioral/quantitative quadrant (what people do) was least represented, with only one study reporting use of log analysis.

In summary, there is not a meaningful change in types of organizations represented, research questions, number of participants and types of research methods between Kupersmith's analysis in 2011 and this one.

R2: What Library Terms Do Users Understand?

Though we were looking for terms users understand, we found far more studies mentioning terms that users didn't understand (table 3). Overall, we identified forty-one unique understood terms in the literature, compared with 106 unique misunderstood terms. Eleven unique terms fell within both categories. As the main goal of many studies was to improve a library website or sites, we think the results tended to highlight pain points such as misunderstood terms. Also, we did not mark a term as understood unless the study indicated that it had been tested, so many improved terms were not included in the understood term list.

TABLE 3
Terms Identified in Studies, Understood, Misunderstood, or Both

Understood Terms	Both	Misunderstood Terms
[vendor name]	Acronyms	Full book PDF download available
About	Articles	[database name]
Advanced search	Ask a Librarian	About Us
All Databases	Chat Icon	Adobe Digital Editions
Book	Clinical information	Articles & Databases
Check holdings	Full-text	Articles & more
COM 100 (or other class name) Guide	Icon	CAARP test
Contact Us	Library catalog	Call number
Find	List of Journals and Magazines/Journal Title List	Catalog
Find books and media	Peer-reviewed	Chinook classic
Guest	Research Guides	Circulation policies

TABLE 3
Terms Identified in Studies, Understood, Misunderstood, or Both

Understood Terms	Both	Misunderstood Terms
Help		Citation
Hours		Classic Catalog
Include results outside of library databases		Clinical Specialties
Materials		Collections
Medical		ConnectNT
PDF Full Text		Course reserves
Print Books Only		Creation date
Quick Links		Database
Quick Search		Digital commons
Resources		Digital library
Send To		Digital scholarship
Tools		DocRetriever
Services		Document Delivery
Sign in		E-journals
Textbooks		Evaluating what you find
Videos		Expand My Results
We don't have a physical copy at CSUDH, but you can still get it. Sign-in to request it from another library"		EZ Borrow
We don't have a physical copy in the library, but you can still get it		FAQs
		Find it at Pratt
		Get It
		Google Preview
		Guided search
		Guides
		HELIX
		Hold
		How Do I
		How to distinguish between types of periodical
		Identifying and narrowing a topic
		Identifying search terms
		ILL
		Indexes
		Information Literacy
		Instructional support
		Interlibrary loan

TABLE 3
Terms Identified in Studies, Understood, Misunderstood, or Both

Understood Terms	Both	Misunderstood Terms
		Journal
		Journal articles
		Journal titles
		Journals A-Z
		Learn About
		Libguide
		LibGuides
		Library Help
		Library Information
		Library instruction
		Library Location
		Library locations
		Library Service
		Media services
		Member node
		Mobile Databases
		Newspapers
		No full-text
		Novanet catalogue
		OER
		Off-campus access
		OhioLINK
		Originator
		Peer-reviewed Journals
		Periodical
		Placing an item on hold
		Privileges
		PubMed
		Recall
		Reference Resources
		Reference Sources
		Renew Materials
		Request Delivery
		Research Tools
		Reserves
		ROBCAT
		Scholarly/peer reviewed
		See Online Tutorials

TABLE 3 Terms Identified in Studies, Understood, Misunderstood, or Both		
Understood Terms	**Both**	**Misunderstood Terms**
		SO Journal Title/Source
		Subject Guides
		Subject Librarian
		Title
		To request to have this resource delivered to you (ILLiad) please sign in.
		Top Resources
		Topic Guides
		Tutorials
		Use our Spaces
		User Groups
		Using the Library

We found understood terms generally aligned with two of Kupersmith's findings:

1. *Use natural language equivalents on top-level pages*. Understood terms generally used natural language and target words like "Find books."
2. *Enhance or explain potentially confusing terms.* When hard to understand terms were provided extra text or mouse overs for context, users were successful.

These two findings were explicitly referenced in all but four of our fifteen library service categories (search box, citation styles & management, datasets, images). We cover these terms and findings in more depth in the discussion section of this paper.

In addition, we identified a third theme that aligns with Nielsen Norman's Heuristic #4: Consistency and standards, which advises following industry-wide conventions so that users may apply learned behaviors from one situation to another.[34] Many of the studies we reviewed found that participants had no problem with terms that appeared across many other sites like "Hours," "Services," "Help," "About," "Tools," "Services," and "Advanced Search."[35] Terms commonly used in libraries, such as "ask a librarian," and "library catalog'' were also understood in limited capacity.[36] Other recognized specific terms were frequently-used academic terms such as "peer-review," and widely-recognized database names like "PubMed" and "Google Scholar."[37] Users clearly brought mental models from other experiences to the library website.

R2.1: What Terms Do Users Not Understand?

As previously noted, the list of terms users didn't understand was larger by far than the list of understood terms (see table 3).

Articles, Databases and Journals

The not understood terms appearing with the greatest frequency were "journals" (twelve), "articles" (ten), and "databases" (ten). This generally agrees with Kupersmith's findings. Lemieux and Powelson described participants searching for articles by navigating to the e-

Journal list instead of the main discovery service search.[38] Becker and Yannotta discovered a similar situation, where students didn't know to first go to a tab labeled databases in order to use the databases to search for articles.[39] Even participants using a discovery search had problems; when users were asked to find a journal article, they selected the journal format filter, which then displayed results only at the journal title level.[40] As the terms "database" and "journal" often confuse users trying to find articles, designers should take care when they use these terms and identify easy ways of recovery if users should accidentally use the wrong search.

Circulation and Library Catalogs

The second most misunderstood group of terms related to circulation and library catalogs. These included "library catalog," nicknames of library catalogs, such as "ROBCAT," terms related to functions and services of the catalog (e.g., "reserves," "circulation policies," "placing an item on hold," "interlibrary loan"), and specific library location labels.[41] This agrees with Kupersmith's finding that users misunderstand "Library Catalog" and "Interlibrary Loan."

One reason for the difficulty of understanding the term "library catalog" may relate to a growing confusion between the library catalog, which searches just books, and a library discovery service, which searches books and articles. Two studies observed users assuming that the main search box, or discovery search, contained all library resources and not understanding why they would need to search other places.[42] Conversely, in another study where participants were asked to find physical books, they did not use the "catalog only" filter, which would have increased their success of finding books within a discovery service, because they did not equate the catalog with books.[43]

Local nicknames for library catalogs, such as "Chinook classic," "classic catalog," "HELIX," and "ROBCAT,'' were also found to be ineffectual in conveying the contents or purpose of a library catalog.[44] Recognizing that not all users know that the library catalog is the main repository for books, some researchers dealt with this issue by renaming the library catalog "books," or "books and media."[45]

Interlibrary Loan

Interlibrary loan was especially challenging for users to understand as librarians and users had different perceptions of the service. Sundt and Eastman's card sorting study showed most participants sorted interlibrary loan under a resource-related category instead of a service-related category, which is where librarians tended to locate it.[46] Swanson et al. noted that, when asked to get books from various systems, "[participants] did not recognize the difference between interlibrary loan, placing an item on hold at the main campus and requesting delivery of items to our satellite campuses. Internally, these three services involve different staff members and processes."[47] The authors ultimately recommended placing all of these services on one "order items" page to conform to the user's expectations. Valenti observed that users tasked with finding a book outside the library went to the menu labeled "find" or navigated directly to the other library's website.[48] Studies repeatedly showed that, for many users, interlibrary loan services were associated with the task mindset of requesting something that the library doesn't have, which was at odds with the librarian separation of interlibrary loan and circulation services.

This difficulty interpreting interlibrary loan options persisted in discovery services. Participants in Comeaux's study on the Primo discovery system, upon viewing a message "no full-text," were expected to click a link labeled "services" and then navigate a list of options; however, "part of the difficulty was the students' tendency to view "No full-text" as a dead end."[49] Those who continued demonstrated confusion on several points related to terminology and process: they did not equate services with interlibrary loan; did not understand what the term interlibrary loan meant; and they had to choose between multiple interlibrary loan service options (depending on the user's affiliation). A later study looking at a multi-campus Primo implementation found that success requesting items from interlibrary loan was predicated on several factors: whether the library showed interlibrary loanable items in the default search; whether the library showed interlibrary loan options before the user logged in; and whether the library used sufficiently clear language for users unfamiliar with interlibrary loan or ILLiad.[50] Clear terminology, previous familiarity, and placement of this term were critical for task success.

Research Assistance

The final large category of misunderstood terms relates to librarian research assistance services, both in person and virtual.

Multiple studies mentioned "subject librarian," or "find a public specialist" as not effectively conveying to participants that librarian experts offered assistance with in-depth research questions.[51] In one particularly dispiriting example, Chase et al. reported that, when asked to find information about research assistance, participants navigated away to a non-library site (specifically, the institution's research foundation) or were otherwise not able to find the information.[52]

Many studies found that participants struggled to conceptualize the idea that librarians would create research guides to support their research process, what these guides would contain, and how such guides might help them.[53] Denton et al. observed that users did not have a mental model for this type of help, noting the continual poor performance of their help guides on their library website despite making changes to what terms they employed.[54] In a study by Conrad and Alvarez, "students expected the "research guides" link on the homepage to direct them to a list of book and article results for the specific subject or discipline referenced."[55] Other studies also found that users expected "research guides" to themselves be databases, or a list of links to online resources, more akin to a bibliography, rather than process-oriented narratives.[56] Actions taken to rectify this problem included:

- Using course names in the titles of guides.[57]
- Grouping guides together under a common heading, like "tutorials."[58]
- Including the word help in the title (e.g., "help finding books"), to try and signify the guide's purpose to users.[59]

Other studies suggested making research/course guides more "googlable" to align with user behavior to search the internet for help when running into difficulties.[60]

Discussion

Reviewing fifty-one articles from 2012-2021, we find ample evidence that library jargon continues to present challenges to users. While many of the findings repeat those of Kupersmith's paper, the studies examined offered further nuance and examples that might help librarians understand the complexities at play when choosing terms to use on the library website.

Conflicting Findings

We found many examples of conflicting evidence in the articles. In particular, eleven terms were noted as both understood and misunderstood (see table 3).

Industry and Branded Terms

Terms used throughout the industries of higher education and libraries such as "peer reviewed," "resource," "full text," and "article,'' discussed earlier in this paper, could both be understood or misunderstood based on a user's previous exposure to the term. Likewise, specific course names, generic names for library services or popular branded databases held meaning for users, but only with previous exposure. Otherwise, names that were library-specific, whether databases or catalog nicknames, tended to cause confusion.

Icons

There were conflicting findings about the use of icons instead of terms to convey meaning. Users preferred icons to words when they were easy to understand but were frustrated when they couldn't tell the icon's meaning. Galbreath et al. and Jacobs et al. both mention that commonly used icons (e.g., pin icon, email icon, and chat icon) were easy to use in a discovery system.[61] However some icons hindered task completion: those that caused users to guess the incorrect format;[62] those where inconsistent mouseover language was used;[63] and those that exhibited unexpected behavior.[64] As icon use continues to become more ubiquitous, designers should take care to choose icons with the same care that they give to terms, avoiding inconsistent, unclear or poor-quality icons, and following best practices related to consistency, labeling, legibility, contrast and clickability.[65]

Kupersmith's Summary Findings and Guidelines

As mentioned in the introduction of this paper, Kupersmith presented seven best practices, all of which we found to hold true. In this section we discuss evidence supporting the continued relevance of all seven.

Test to See What Users Do and Don't Understand and What Terms They Most Strongly Relate To

The number of articles identified through our search strategy suggests that libraries continue to vigorously test, acknowledging that only a proportion of testing undertaken in libraries is subsequently submitted for publication. Beyond libraries, regular user testing is generally accepted as a standard and best practice.

Avoid—or Use with Caution—Terms that Users Often Misunderstand

In our discussion of R2 earlier in this paper, we delved into understood and misunderstood terms, finding that misunderstood terms (total: 106) occurred approximately twice as often as understood terms (total: forty-one). Our findings supported Kupersmith's further comment related to this recommendation: "if you must use terms frequently cited as problematic in usability studies …expect that [a] significant number of users will not interpret them correctly."[66]

Study participants were very clear that local 'nicknames' and many library acronyms are not meaningful or understood.[67]

Previous interactions with library employees (e.g., instruction, assistance at a desk) appear to be influential in term comprehension and/or future task behavior. For example, Gillis noted, "one participant even noted that she had always used the link under the Favourites menu since she had been instructed to do so earlier on by a librarian."[68]

For users who are less familiar with library processes, some frequently used terms (e.g., "resources," "information") resulted in ambiguities that impacted their ability to interact with library websites. In Mitchell and West's study, which focused on distance students, participants struggled to understand or interpret labels or terms.[69] Sundt and Eastman's card sorting study supports our earlier finding that associations to broad terms such as "resources" and "services" are mapped differently by librarians and users.[70]

Use Natural Language Equivalents on Top-Level Pages

The Nielsen-Norman Group found as early as 1997 that, when looking at information on the web, people are task-focused and scan instead of read; they re-validated their results in 2020.[71] Using natural language and target words aligns with these findings.

Participants in Sundt and Eastman's card sorting study preferred the word "find" in high level navigation.[72] In the Paladino et al. study, participants preferred "find books and media" instead of "library catalog."[73])Other examples of target words or action terms useful to users were "contact ss," "check holdings," "include results outside of library databases," "send to," and "sign in."[74] Understanding what tasks users wanted to complete were an essential part of constructing these terms.

Enhance or Explain Potentially Confusing Terms

Kupersmith recommended expanding text or labels, or adding enhancements to text or links (e.g., mouseovers) to clarify meaning. This recommendation points to the tension in web writing to be concise, yet not so concise readers cannot understand.

Echoing back to the previous recommendation, clear and concise natural language labels were preferred, though slightly longer explanatory text was acceptable when unavoidable. Lierman et al. found that, "several [users] noted specific instances in which they would not have understood the nature or purpose of a database without the description that was provided."[75]

As discussed previously, participants' and librarians' ideas of clear language differed. Conerton and Goldenstein noted, "one interviewee commented that a tab labeled "articles" should be labeled "search databases" because the page did not offer a list of articles."[76] Dease found that "some users were unable to determine which [homepage] shortcut to [specific library resources to] click on by looking at the icon and label alone. One user in particular

TABLE 4
Examples of Original and Expanded Terms

Original Term	Expanded Term	
Journal Title List	List of Journals and Magazines	Becker and Yannotta, 2013
Expand My Results	Include results outside of library databases	Jacobs et al., 2020
To request to have this resource delivered to you (ILLiad) please sign in	We don't have a physical copy at CSUDH, but you can still get it. Sign-in to request it from another library.	Jacobs et al., 2020.

could not determine the difference between books and databases and referred to them as 'librarian words.'"[77]

Numerous studies cited examples where language was clarified to better indicate link meaning, of which a few selections appear in table 4.[78]

Interestingly mouseovers were rarely mentioned by study participants or employed by study authors as a solution. This might be due to new accessibility and usability issues with mouseovers which are especially problematic on touch devices.[79]

Provide Intermediate Pages

Specifically, Kupersmith recommends that, "when a top-level menu choice presents ambiguities that can't be resolved in the space available … have your Find Books link lead to a page offering the local catalog, system or consortium catalog, e-books, WorldCat, etc."[80]

Current practice in top level navigation seems to confirm Kupersmith's advice is frequently followed, with categories such as "find" leading to intermediate pages with additional information and links. Task-based groupings are preferred over 'user type' groupings.[81] Some findings suggest that the same confusion and ambiguity regarding categorization can recur with groupings for intermediate pages so careful consideration and testing is advised.[82]

In response to "confusion in selecting from the different delivery services that our library offered," Swanson et al. created a single page titled "order items" to provide access to three delivery and request options.[83] Dease described revisions to information architecture to address "duplicate content and … critical information that was difficult to find."[84] Brown and Yunkin found that 'pop-up' menus with multiple choices were not clear: "many users did not recognize that popup lists functioned as menus … users did not seem to understand the difference between library "Information" (label in the first popup) and a library "Service" (label in the second popup), indicating that navigation was not intuitive."[85]

Provide Alternative Paths

Kupersmith's suggested action on the part of libraries—creating cross-references "where users are likely to make predictable 'wrong' choices" —was not explicitly addressed in many of the studies. However, numerous findings reporting continuing user confusion about library collections and services suggest that careful attention should be given to this type of contextual linking.

Users frequently struggle to distinguish between the purpose, destination and scope of search boxes or tabs and tend to assume more rather than less comprehensive coverage.[86] Azadbakht et al., 2017 reported, "participants from all groups, especially undergraduate students, assumed that any search box on the Libraries' website was designed to search for and within resources like article databases and the online catalog, regardless of how the search box was labeled."[87]

Results suggest that users expect information about specific library policies related to materials (i.e., loan periods) to be available from links referencing the materials themselves, such as "books and media."[88] This conflicts with libraries' frequent practice of making use of the categories "resources" (for databases, collections/materials) and "services" (for physical facilities, borrowing/request functions).

Similarly, placing links to specific help at points of need to better integrate into the user's help-seeking process might address misunderstandings and lack of information about subject-

specific research supports noted earlier in this paper. Conrad and Alvarez discovered that users did not gain awareness of available library services from navigation text, in particular services related to physical spaces.[89]

As discussed in previous sections, it should not be assumed that users understand the purpose or content of different library resources, nor that they distinguish between various levels of content types (article, journal, database).[90] Librarians should understand which content types get confused and offer clear pathways from one to the other.

Be Consistent

This finding is also widely accepted as a best practice in information architecture, website design and learning theory; for example, Nielsen's heuristic on this topic was cited earlier in this paper ("Consistency & Standards").

Participants noted inconsistencies in tab names, icon types and application and functionality (e.g., a visualization for relevancy mirrored the style commonly used for ranking in commercial sites) in multiple studies.[91]

As previously found, participants' familiarity with terms strongly impacted task success emphasizing the importance of consistent use of known terms. Lierman et al. found that, "in general, users latched on quickly to terms in subpage and box titles that seemed relevant to their tasks, and some expressed feelings of increased confidence and reassurance when seeing a familiar term featured prominently on an otherwise unfamiliar resource."[92]

The relationship between electronic resources/services and physical resources/services was not always clear, increasing the importance of consistency and alignment of terms used online and in physical spaces. Becker and Yannotta made changes to terminology in order to increase consistency across modalities, using the phrase "checkout policies" online to mirror language at their physical circulation desk.[93]

In addition to Kupersmith's original seven guidelines, we propose an eighth guideline.

Follow Industry-wide Conventions

When encountering terms common in other websites like "about," users generally were able to apply past comprehension to the new term, as long as the term correctly aligned with their expectations.

This eighth guideline reflects a new theme identified in the literature, where libraries were able to adapt terms used on other websites in such a way that the user could use their previous mental models to successfully complete the tasks. It also reflects a common finding in many of the studies we reviewed: users brought their past experiences to the library website and these experiences informed what they did.

Gaps in the Research

The library literature primarily represents studies done in academic libraries, with few special libraries and, in this literature review, no public libraries. This is reflective of the library science field as a whole, as public libraries are underrepresented in the literature.[94] However, evidence such as case studies, online reports, and project descriptions show the importance these other library organizations place on user studies.[95] Dedicated efforts to publish studies including public libraries and special libraries, and a greater attention to the gray literature in future literature reviews, would allow us to contrast and compare organizational findings.

We found only a few studies that used behavioral/quantitative methodologies like analytics or text mining. Using these methods alongside qualitative interviews or usability tests would enlarge the sample size and provide complementary evidence. For example, going through chat transcripts and focusing on words used around a particular service or policy might help libraries identify term alternatives to test in a usability study or identify task-based questions.[96] Comparing the clicks on different term options for the same menu item or service using A/B testing could provide a larger sample from which to make a final decision.[97] More research identifying ways analytics can best inform usability testing, and vice versa, could offer time-strapped organizations clearer ways to continually evaluate the user experience.

A majority of studies focused on one organization with one website or platform configuration. An interesting exception is the multi-campus comparison of local configurations to a discovery service done by five campuses in the California State University Libraries system. This study, organized by a cross-campus team focused on discovery and usability, compared population and terminology configuration differences in a way challenging to do with a single platform.[98] Multi-campus or consortial involvement in usability studies can provide a larger and more representative sample size of users, spaces, and terminology choices. It could also provide an alternative to A/B testing, as seen in a more recent article done by the same consortium.[99]

Like Kupersmith's review, our scoping included studies discussing library terms online, and excluded studies done on physical spaces. But terminology is not found only in the online world. Research around signage and wayfinding contain valuable additions to how library users perceive and use library terminology.[100] Additionally the service design approach, which uses design thinking methods to create or reimagine a service, could identify terminology that makes sense to users across many platforms and channels such as emails, signs, language at the service desk and websites.[101] This omnichannel model, becoming more accepted in business studies, provides a way to examine how physical and online environments interact.[102] In the future, we see literature reviews on library terminology including studies that represent library terms users understand in both physical and online environments.

Conclusion

This review finds that Kupersmith's guidelines are still relevant to today's *academic* library websites, with a few minor exceptions due to technological advancements. We emphasize academic, as the majority of studies featured academic libraries, and no studies featured public libraries. We added an additional guideline, "Follow industry-wide conventions," to highlight how context guides users' understanding of library terminology. Librarians should look at evidence that they currently collect, such as chat, emails, and reference conversations, to better understand what services users expect to encounter and how they would describe those services. Future reviews should consider library terminology use beyond the website and examine how the different modes of communication clarify Kupersmith's guidelines.

Notes

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Student Life, Diverse Institutional Histories, and Archival Policy: Inclusion of Student Life Archival Material in University Archives' Collecting Statements

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Current literature outlines the importance of—and strategies for—collecting student life material in institutional archives but does not address the inclusion of this material within collecting statements. This study examines publicly available collecting statements from Association of Research Libraries (ARL) institutions' university archives, seeking mentions of student life archival material, diversity, and proactive approaches for collecting said material. Findings suggest that while many ARL institutions mention student life in these policies, most do not make the connection to how this material relates to diversity within the university archives, nor do they provide a proactive approach for collecting this material.

Introduction

University archival collecting practices and policies originated in service to administrative priorities. Yet administrative documentation alone can never convey the rich, complex, multiple histories of any institution. Given the history of higher education, and the predominantly white administration of large research institutions, student bodies are generally far more diverse than their faculty and administrators. Commitment to social justice requires expanding the scope of archival collections to include and uplift the voices of those the institution aims to serve: its students.[1] In addition, student success is at the forefront of university missions, so collections of student life materials document their growth on a holistic level beyond the academic realm.

The primary interest of this study is in materials that document shared student life, as well as the collective student experience on campus outside the classroom. Diversity in archival collections goes beyond having a complete record; it is a way to welcome people into a space that has not historically acknowledged and uplifted marginalized voices. Making archives inclusive spaces for teaching and learning means that students will see their experiences and perspectives reflected in the collections. As an undergraduate student, the lead author visited her institution's university archives with a student organization and had the opportunity to

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see her experience on campus reflected in the institutional history. This powerful moment is a guiding principle in her philosophy as a University Archivist, as is awareness of her privileged place in society that allowed the moment to happen. Not all students have this connection when they visit their institution's archives. Many students have the opposite experience, seeing no representation of themselves or the communities they represent. Representation and connections to the record are vital for students to feel welcome in the archives and included as part of an institution's shared histories. When students connect with something in the archives, it highlights the value of primary source research and sparks students' curiosity and engagement. The second author occupies a similar position of privilege as a white, second-generation college graduate but had no exposure to university archives as a student.

While many archival professionals have discussed methods, strategies, and case studies for collecting student materials, no study to date has been found that examines how publicly available statements address the records of campus life outside the classroom. This study investigates the ways large research universities express collection policies concerning the records of student organizations and campus life in statements that were publicly available on their websites as of the summer of 2021. This paper defines *student life archival material* as non-academic student records generated outside the classroom. In the words of John Straw, "Student life encompasses the social, recreational, cultural, political, religious, and all other aspects of the student experience beyond the classroom."[2] This includes the records of official student organizations as well as unofficial materials and evidence of the student experience more broadly and excludes individual student academic records, theses/dissertations, and generally, campus-wide student publications such as yearbooks or newspapers. This study's specific research questions were as follows:

- To what extent do members of the Association of Research Libraries (ARL) provide official archival collections policies or other statements to the public on their websites?
- To what extent and in what ways do such public-facing materials address records relating to students outside of the classroom?
    - Do the policies mention diversity or underrepresented groups?
    - Do the policies specify proactive outreach to student organizations or provide resources to guide the student organizations?

Literature Review

This study is situated in the larger literature examining how collection development policies for university archives evolved, as well as what purpose such policies serve.[3] Jennifer Marshall established how the seminal work of Faye Phillips in 1984 generated consensus about the value of collection policies to guide selection priorities in college and university archives. Cynthia Sauer provides evidence that most institutions with formal policies developed them in the 1980s and 1990s, stating:

> by the 1990s collection development policies and collection management strategies were moved to the shrine of archival theory—something that all repositories should have. Their actual use and development, however, was all but ignored as archivists' attention turned to other issues and challenges.[4]

Accordingly, in 2001, Marshall identified only 38 policies available to the public online (out of 884 college and university archival programs whose websites were accessible (<5 per-

cent)), and, furthermore, found few similarities in the content of policies. Marshall surmised that these public-facing documents might have been designed to address donors rather than to inform decision making.[5]

Ellen Swain traced how the emergence of social history in the 1960s eventually led some archives to turn their attention to the records of student extracurricular activities and organizations to flesh out institutional histories from the perspective of those with less power on campus.[6] The passage of the Family Educational Rights and Privacy Act (FERPA) in 1974 led to concerns among college and university archivists about how it might limit their ability to document the student experience. It is worth noting that there is a significant literature on the challenges of archiving individual student academic records and other identifiable material affected by FERPA; however, that particular topic is outside the scope of this paper.[7]

In 1978, the Society of American Archivists declared:

> From both a research and an administrative standpoint, institutions of higher learning have a special obligation to preserve the records of individual students, student organizations, and campus life. Students are the most important products of higher education. Student records are essential to an understanding of the educational process over time. The impact of higher education in America and the changing lifestyles and experiences of college students can be studied and evaluated only if institutional files are maintained and made available for research use.[8]

Decades on from this assertion, it is not clear how many university archives have collecting policies for student records beyond those mandated by institutional needs. Jessica Wagner's work suggests that the extent of archival collections on student life is small; in a convenience sample survey, 72 percent of respondents said they had no collections policy for student materials.[9] This study found no other studies investigating collections policies for student life materials across institutions.

Numerous case studies address collections of student life materials at individual institutions; some of these mention their collection development policies.[10] At Kent State, La'el Hughes-Watkins stated that,

> Before engaging in outreach efforts, it was critical to strengthen the policy's language regarding efforts to acquire archival materials of historically underrepresented people and communities. Creating a clear policy sets a tone and provides official documentation of an archives' philosophy.[11]

Similarly, Aleksandr Gelfand noted the repercussions of a lack of a focused policy for collecting online materials from student groups: a collection that grows too fast to be adequately curated, described, and preserved.[12]

There are even more case studies about how individual institutions within and outside the ARL have reached out to student organizations to fill collections gaps in this area.[13] This suggests that a wide variety of university archives are dedicated to representing student voices, including Adelphi University, California Polytechnic University Pomona, California State University-Chico, Indiana State, Iowa State, Kent State, New York University, Princeton,

University of California Los Angeles, University of Illinois Urbana-Champaign, University of KwaZulu-Natal in South Africa, University of Nebraska-Lincoln, University of Northern Colorado, and Washington State University Vancouver. Archivists in these institutions have focused on a range of materials including oral histories and the online presence of student organizations, as well as a range of approaches to collecting such materials including web scraping and collaborative partnerships with student groups.

This study fills a gap in the literature documenting the growth in archival collections policies that address student life materials, particularly considering the diverse views of campus life that such materials offer.

Methods and Data

This study examined collection development policies and other public-facing statements from 114 higher education institutions within the Association of Research Libraries (ARL), excluding two member institutions that do not have a university archives program and one member institution whose website was not in English. The lead author collected the dataset in December 2020 and updated it in summer 2021. Data collection involved navigating institutional websites for archival programs to search for publicly available documents describing the collecting priorities for the institution. The study looked only at public materials to avoid comparing internally and externally directed policies. This approach also resulted in a dataset of materials that students at these institutions could readily review if interested. In other words, the documents examined are statements from the institution to the public declaring their collecting policies and practices.

It is possible that this approach missed relevant documents; the project was instructive about how differently library websites are structured and how difficult they can be to navigate, an issue that Marshall also noted.[14] The authors welcome correspondence from archivists at ARL institutions whose material was inadvertently omitted from the study.

Additional data gathered about the 114 institutions are described in table 1. After this data collection,the content from the 92 institutions that had available policy documents or

TABLE 1
Institutional Data Points

Data Gathered	Definition/Source
Organizational status of university archives program	• Standalone unit • Part of larger special collections unit
Private/public status	Carnegie Classifications[15]
Geographic region	U.S. Census categories
Enrollment numbers and library expenditures	• U.S. institutions: IPEDS 2018-19[16] • Canadian institutions: CARL FY2017-18[17]
Commitment to documenting historically marginalized student movements	Membership status in Project STAND[18]
Availability of online archival collections policy	• No policy or statement available to download • Official archival collections development policy posted publicly • Statement other than a formal policy on a webpage or research guide

TABLE 2
Qualitative Coding and Definitions

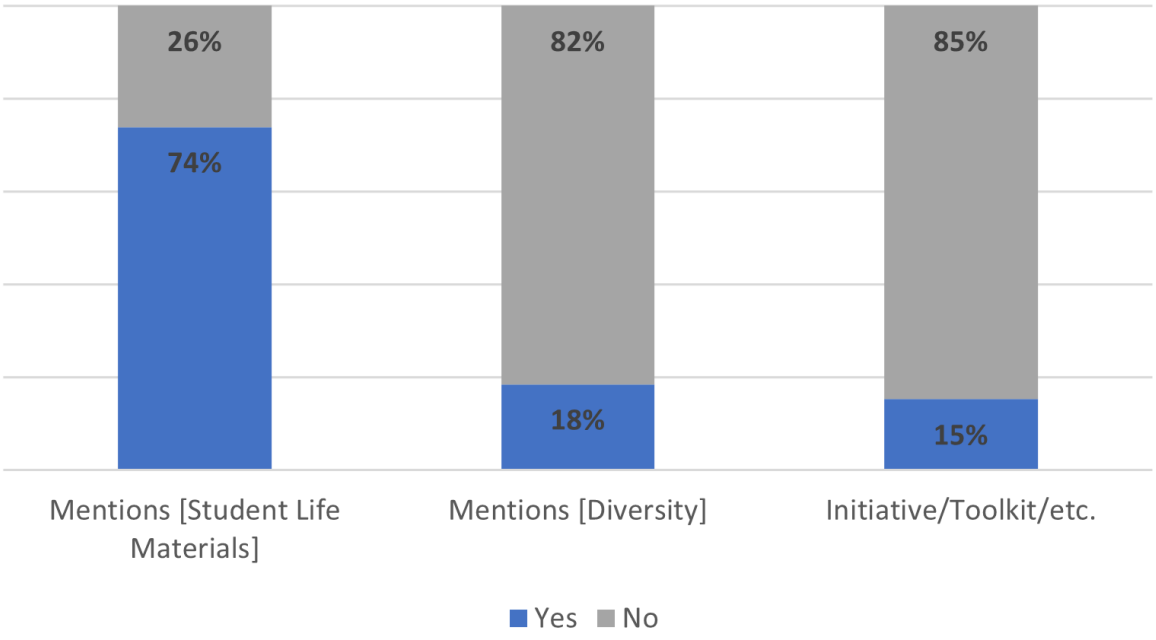
Coding Element	Definition and Terms
Does the archival collection development document mention student life material?	Included: Mentions of non-academic student records generated outside the classroom. Excluded: Mentions of general, campus-wide publications such as yearbooks or newspapers.
Does it mention diversity in the context of student life material?	Included: *DEI, diverse, diversity, EDI, marginalized, minoritized, minority, underrepresented*. Excluded: Diversity in terms of varying topics or formats, rather than creator identities.
Does it include proactive approaches for collecting student life material?	Included: Special initiative, project, research guide, or toolkit.

statements were then coded for mentions of three elements: student life materials, diversity, proactive approaches (table 2). Finally, the lead author examined in-depth documents from four (4) institutions that were coded *yes* on these three elements. This analysis included summarizing specific initiatives, projects, and/or toolkits made available, noting the role of students as outlined by the policy, and delineating why this type of work is important to each institution based on the language of the document.

Findings

Of the 114 ARL institutions included in the dataset, 92 included viable policies or statements that could be analyzed. Of these, about 66 percent (*n*=61) provided public access to the official collection development policy (either via download or posted to the website), and about one-third (*n*=31) provided a statement describing the institution's collecting priorities. Across all

FIGURE 1
Key Elements in Publicly Available Collection Policies (*n*=92)



types of documents analyzed, about 75 percent (*n*=68) mentioned student life materials in some way, but only 18 percent (*n*=17) emphasized diversity as a reason to collect these materials, and only 15% (*n*=14) outlined proactive approaches. Note that of the 26 percent (*n*=24) that did not mention student life materials, there was one institution that did mention diversity. Table 3 lists the 27 institutions (roughly a third of the total 92 institutions analyzed) whose policies mentioned student life, diversity, proactive approaches, or any combination of these three elements. The first four institutions are considered to have exemplary statements, while the remaining institutions are not ranked in an order of distinction.

One finding from the data is that policies that do not mention collecting student life

TABLE 3
Institutions that Mentioned Student Life, Diversity, or Proactive Approaches in Publicly Available Collection Policies

Institution	Mentions Student Life	Mentions Diversity	Mentions Proactive Approach
University of Cincinnati	✓	✓	✓
Colorado State University, Fort Collins	✓	✓	✓
Kent State University at Kent	✓	✓	✓
Pennsylvania State University, Main Campus	✓	✓	✓
University of California, Irvine	✓	✓	
University of California, Los Angeles	✓	✓	
Georgia Institute of Technology, Main Campus	✓	✓	
University of Illinois Chicago	✓	✓	
Indiana University, Bloomington	✓	✓	
Iowa State University	✓	✓	
Purdue University	✓	✓	
Rice University	✓	✓	
University of Rochester River	✓	✓	
Tulane University	✓	✓	
University of Virginia	✓	✓	
Wayne State	✓	✓	
University of Buffalo SUNY	✓		✓
University of Chicago	✓		✓
Columbia University in the City of New York	✓		✓
University of Illinois Urbana Champaign	✓		✓
Johns Hopkins University	✓		✓
University of Manitoba	✓		✓
University of North Carolina at Chapel Hill	✓		✓
University of Pittsburgh	✓		✓
Princeton	✓		✓
Texas A&M	✓		✓
Rutgers University, New Brunswick		✓	

materials often do not mention students in any capacity, including as users of the archives. That is, of the policies that do not mention collecting student life materials, 83 percent use the word *student* three times or fewer. Many of the ARL institutions based in Canada focus more on records management and retention schedules, or do not have a formal university archives program.

Out of the institutions that mention both collecting student life material and materials from diverse/underrepresented populations, four institutions describe proactive collections strategies, such as guidelines/toolkits for gathering archival materials from students and/or a special initiative for collecting this material. These exemplary institutions—based on publicly available statements—are: Kent State University, Pennsylvania State, Colorado State University—Fort Collins, and the University of Cincinnati. These are all public universities, serving between 26,000 and 48,000 students. They are not the institutions with the highest total library expenditures, falling within $491-990 per full-time equivalent (FTE) student. These university archives programs are situated within a larger special collections unit, rather than a standalone unit.

Kent State University has several collection development initiatives listed in its collection development policy. The 300+ Initiative works to bring in records from the university's student organizations and educate student groups, "on the significance of preserving historically significant materials."[19] The Kent State University Black Campus Movement Project aims to collect records related to the Black Campus Movement Project that occurred on campus in the 1960s and 1970s, as well as general records related to Black student life on campus.[20] The third initiative is its LGBTQ Collection, which seeks collections that document LGBTQ experiences on campus and in the northwest Ohio region. These specific initiatives are targeted efforts to "enrich the historical record of Kent State University," and demonstrate a commitment to collecting stories from historically marginalized communities.

Within Colorado State University's collection development policy, there is a Student Activities section under its collection areas of specific interest. This section discusses a variety of records related to student life on campus and connects its collecting focuses to the university's larger diversity initiatives. Connecting the university archives program with university-wide initiatives is essential for any university program because it shows a commitment to common goals. The policy specifically states that a new focus for the program's outreach will be to work with the university's Student Diversity Programs and Services cluster; in addition, the policy lists specific cultural and resource centers on campus. Beyond the Student Activities section, the overall mission of the University Archives and the oral histories section mention student-related activities and students.

Pennsylvania State University is the largest of the four institutions that included all three elements. It is also the biggest spender of the four, with $990 total library expenditures per FTE. Its collection development plan mentions students throughout as users and donors. The plan has a specific section dedicated to the University Archives; it specifically references student and campus life records, in addition to records it retains based on retention schedules. In addition to highlighting students, the section mentions a specific interest in records from "students representing historically marginalized communities."[21] Beyond the collection development plan, the archives provide guidelines for student organization records, which give groups information about preserving their history and donating records to the university archives.

Finally, the University of Cincinnati website includes a page on "Collecting Student Life

Archives."[22] The archives' website states that, "collecting student life is critical to preserving the diverse history of the university" and it provides three options for collaboration with the University Archives.

These four institutions all clearly state the importance of student life records, as well as the potential role they can play in building a more complete and diverse institutional record within university archives. The institutions all have targeted initiatives focused on doing this work and have stated their commitment via a public facing document. Furthermore, Kent State, Penn State, and the University of Cincinnati all provide ways for students to collaborate with the archives and state a willingness to educate students on the importance of preserving their histories.

Discussion

This study shows that few large research institutions address diversity or proactive collection strategies for student life materials in public-facing statements about archival collection development. While it is encouraging that almost three quarters of institutions with online policies mention student life, the majority do not also mention diversity in relation to student life and/or proactive approaches to preserving this material. Even more discouraging, the number of institutions that mention student life drops to 60 percent when including institutions that do not have any policies online. If archives seek to include underrepresented voices, to diversify archival records, and to actively build engagement with underrepresented student groups then—at a minimum—student life materials must appear in collection development policies. Providing students and student organizations with tools and information regarding their records lets students know that their histories matter and can be part of the institutional record. Giving student organizations options, including providing a home for their records or providing organizations with the tools to preserve their own records, shows a commitment to authentic collecting and honoring student organizations' histories.

As noted above, institutions may still be collecting student life material and prioritizing the collection of this material even if there is no public-facing collection policy, and/or if public facing documents or statements make no mention of collecting student life materials. However, if institutions do not include this information in a public facing document or statement, they are not calling attention to its importance. The content of archival collection policies or statements indicate what is crucial to the mission and vision of the given institution. Not including student materials in a collection development policy suggests that an institution is not committed to collecting student life materials. It is difficult to assess whether institutions are starting to place more importance on collecting student life materials because the existing studies are not directly comparable. Wagner (2013) used a convenience sample in 2012 and, although all 110 respondents reported collecting student life materials, only 28 (25 percent) included student life materials in their collecting policy.[23] In the current study of 92 ARL libraries, 74 percent of publicly available policies mention student life materials, but only 18 percent of those mention diversity, and only 15 percent delineate proactive collection strategies.

Archival materials that illustrate student life on campuses may also come to the archives via administrative units on campus, such as surveys, student affairs records, or the records of cultural centers and similar units. However, this type of material is often mandated by record retention schedules and they show student life through the lens of the institution, rather than a student's own perspective. Publications such as yearbooks or student newspapers also

illustrate student life and do typically include students' own perspectives; however, these records come to the archive through the institution rather than students, making them a default collection of student life material, rather than a proactive effort.

In addition to the findings from the content analysis, the data collection for this project highlighted how different and difficult library websites can be to navigate, as well as how wide a range of material provided online is. Special collections and university archives units are situated under a variety of different tabs on library websites, including services, tools, libraries' collections, among others. It was fascinating to observe the range of organization structures, such as institutions where university archives are external to the university library but records management is internal to the library.

As noted previously, a limitation of this study is the possible omission of collection policies or statements that are available online, but that the lead author was unable to locate. In addition, focusing only on ARL institutions excludes the valuable efforts of other kinds of institutions toward archiving student life materials.

Conclusions

Archival collections policies are the heart and backbone of any institution's mission, outlining what they prioritize and deem important. Model policies should address student life materials; the Phillips model mentions students only as potential clientele.[24] A core value of the Society of American Archivists is to, "Respect the diversity found in humanity and advocate for archival collections to reflect that rich complexity."[25] This does not mean that archivists should be collecting diverse collections for the sake of having diverse collections—which should be considered colonial collecting and which can result in tokenizing—rather, authentic collecting needs to be put into practice. This work needs to become normalized to the point where this collecting happens naturally and collaboratively to ensure that placing records with the institution does not become another way to oppress students, silence their voices, or violate their privacy and sense of safety. Rising to this new priority will stretch severely limited resources, yet it is crucial for institutions to fund such efforts.[26]

Stakeholders in academic libraries beyond the archives can also benefit from considering student life in their practice. Liaison librarians, instruction librarians, student success librarians, and collection development librarians (to name a few) should all be looking for ways to make students feel welcome in the library. Specifically, these groups can help promote the collection and use of student life archives. Moreover, the habit of reflecting on student life holistically, with an emphasis on historically marginalized groups, can serve broader goals of diversity, equity, and inclusion.

Further Research

Examination of ARL institutions is important to get a sense of how predominantly white universities are working to diversify their archives. Further research could solicit policies from institutions directly to account for institutions that have policies but are not making them publicly available. It would also be valuable to examine how archival collection development policies change over time. Would a similar analysis in 5-10 years show changes in what large research institutions say about student life materials?

However, assessing their public-facing policies is only the first step. A survey of, or interviews with, archivists at these institutions would clarify what progress they have made

in collecting student materials and how students have responded to the collections policies practices. This further research would allow for a more in-depth look at the number and size of collections related to student life. Do institutions with exemplary policies also have significant holdings of student life material, or are they still working to acquire collections? Perhaps some institutions have many collections related to student life even though their policies lack the elements addressed in this study. This is important, because collecting statements are not the only way to welcome and include people in an archive; the actual collections are what is most important and where people will find their histories reflected.

Looking beyond the ARL institutions will provide a more complete picture of how student life is reflected in archival collections, especially in the case of Historically Black Colleges and Universities and smaller regional institutions. Finally, student life records are only one avenue to diversifying archives. Other populations on campus are also omitted from the institutional record, such as staff and contract workers. Research exploring how institutions document the role of these essential groups on campus would contribute to the larger project of diversity in institutional archival collections.

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Creators in the Academic Library: Collections and Spaces, Rebecca Zuege Kuglitsch and Alexander C. Watkins (eds.), ACRL, 2023. 278p. Softcover, $72.00. 9780838939826 (Review 2 of a 2-volume title)

Creators in the Academic Library: Collections and Spaces, edited by Rebecca Zuege Kuglitsch and Alexander C. Watkins, is the twin pillar to the work by the same editorial team of *Creators in the Academic Library: Instruction and Outreach*. This second volume, *Collections and Spaces,* presents a similar approach of partnerships between faculty, staff, administrators, and students. Whereas *Instruction and Outreach* addressed the collaboration of faculty and students to design effective library instruction, this volume offers insight into the best practices of utilizing spaces, materials, methods, tools, and services. Kuglitsch and Watkins bring together an expansive group of authors, providing a combination of different perspectives that cover the concepts both of library as *space* and library as *resource*—with the two elements linked seamlessly throughout the narrative. Rather than compartmentalizing the aspects of collections and spaces into separate library related topics, the text fuses the two and presents both as a form of service to patrons.

The emphasis placed on equity in many of the chapters demonstrates the importance of representation and diversity in higher education. The chapters "I Got So Much Magic, You Can Have It," "Creating Equitable Access to Creator Spaces, Tools, and Resources," and "MakeHERspace: Cultivating an Inclusive Creation Environment in the Library" center on the variety of current and potential patrons who should be represented when planning library spaces and resources. In creating inclusive environments, the authors lay a foundation for forming collaborations between library staff and users to create impactful services and safe spaces.

Collections and Spaces also examines the role of the creator and innovative activities within librarianship. The work develops continuously, chapters flowing seamlessly into the next, building a consistent thesis throughout the text. The core principle is that the library is not only a catalyst for invention, but is a fulcrum for the creators themselves. "From the Formal into the Informal: Connecting with Creator Students through Societies" directly addresses the need for intersectionality in instructional methods looking at the benefits of peer-led teaching in communities of practice in combination with research. Moving beyond traditional physical spaces, librarians can connect with student societies through instruction as well as outreach. This technique begins by centering the physical library but then extends beyond the traditional brick-and-mortar building to a virtual, online setting (p. 199).

"Special Collections as Muse," by Harmeyer and Grimm, studies the novel use of collections to inspire students and spark further interest in given areas of study. The authors utilize special collections resources as a means of outreach and advancement, in addition to the role archivists play as repositories of knowledge. Partnerships between archivists and students can enhance classroom learning by linking to the historical past via materials available in special collections (p. 15)—an intersection between collection development as well as recognition of lived experience, and teaching. In a similar way, "Throwing It All at the Wall" is an excellent case study of addressing patron needs, developing a technology equipment collection, and study-

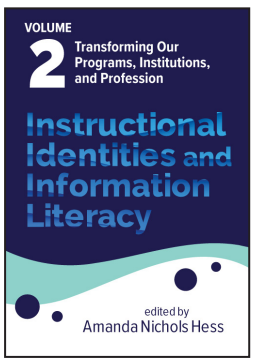
ing usage results. Data collection then results in a cost analysis determining future funding for expanding the most highly utilized materials. In this way the editors link the importance of space and collections in strategic planning.

One of the most compelling connections between the chapters is the fact that all of the case studies compiled by the editors highlight the fact that the straight-forward steps taken by the authors could be easily applied to the reader's own library. Inspiration for developing spaces and collections is not solely found within the classroom and research consultations. Rather, physical and digital library spaces—along with a library's collection—can provide unique insights into service, instruction, and outreach roles.

The use of the library in facilitating pathways for projects focusing on environmental preservation is particularly compelling. Embree and Gilman's "Creators for the Earth: The Academic Library's Role in Supporting Sustainability Creators and Practitioners Across All Disciplines," and Cassidy and Scully's "How Collaborative Innovation Aided in the Fight Against COVID-19" provide powerful examples of librarian efforts advancing information literacy in connection with social responsibility. A few libraries built pollinator gardens, increased their recycling efforts, or added books promoting sustainability and environmental responsibility (p. 215). Texas Tech University Libraries supplemented their personal protective equipment (PPE) during the pandemic using their 3D printer in their makerspace area making face shields (p. 94).

The target audience of Kuglitsch and Watkins's Volume 2 is similar to that of *Creators in the Academic Library: Instruction and Outreach*—library professionals in higher education institutions, primarily in research university environments. Showcasing the ability for collaboration among library and other university departments, the chapters present both examples and overarching ethical approaches to creative projects in academic libraries. The chapter contributors utilize clear and direct language, and define methodologies and assessments through the structure of the ACRL Information Literacy Framework. The book can be used as a guide for initiating similar projects or for generating ideas that transcend the norms of traditional library space in order to develop new services. A comprehensive book, Volume 2 is best read as a companion to Volume 1. — *Andrew Beman-Cavallaro, Assistant Librarian University of South Florida*

Instructional Identities and Information Literacy: Transforming Our Programs, Institutions, and Profession, Volume 2, Amanda Nichols Hess (ed.), ACRL, 2023. 200p. Softcover. $65.00. 9780838939468 (Review 2 of a 3-volume title)



Transforming Our Programs, Institutions, and Profession is the second in a three-volume work edited by Amanda Nichols Hess, the Coordinator of Instruction & Research Help at Oakland University Libraries in Rochester, Michigan. This second volume of *Instructional Identities and Information Literacy* focuses on higher-level change, moving on from Volume 1, which addressed individual instructional identity. The transformations discussed in this volume include departmental changes, institutional changes, and changes to academic librarianship as a discipline.

This edited work is composed of chapters written by a variety of instruction and academic librarians in the field. Like the first volume, Volume 2 is divided into three separate sections—Part I: "Program-Level Transformation," Part II: "Institution-Level Transformation," and Part III: "Profession-Level Transformation,"

—each one describing the experiences of librarians in applying transformative learning theory to their own programs, institutions, and library practice. *Transforming Our Programs, Institutions, and Profession* continues the series' overarching theme applying Mezirow's transformative learning theory to the library, programs, and the profession. Adjusting Mezirow's initial philosophy, the editors use a "broader and more all-encompassing view of transformative learning to think about how our mindsets, attitudes, and behaviors might change around our work as information literacy instructors" (p. viii).

Librarians and contributors describe their own experiences while also incorporating other pedagogies, theories, and tools including constructivism, learner-centered design, critical and feminist pedagogy, collaborative design, social emancipatory transformative learning, and curriculum mapping. The wide variety of tools and theories used in combination with transformative learning theory emphasizes how these methodologies can be applied to a variety of situations and experiences in developing instructional identities.

Part I, "Program-Level Transformation" contains five chapters examining transformations in library science programs, expanding student outreach, and generating support for new instruction methods. Contributors encourage instructors to look for learning opportunities inside and outside the classroom, to form partnerships with other academic departments, and to self-reflect on what did and didn't work. These shared practices can be adapted and applied by different instructional departments or academic libraries that are looking to make improvements or implement policies to support information literacy.

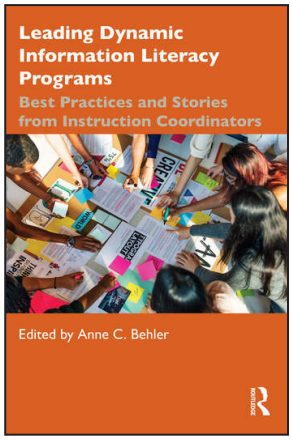
Part II, "Institution-Level Transformation," is comprised of five chapters outlining changes at the institution level. These chapters explain the experiences of a small reference and instruction department in influencing departmental change, the use of professional development to increase faculty information literacy, integration of information literacy into the general education curriculum, developing a shared instructional identity, and the creation of a scaffolded instructional program in the university. Working with colleagues who also are developing their own transformations, educators may find encouragement and support. These experiences could be considered as next steps from Part I because authors also address making changes to their institution which can involve politics and the need for advocacy of information literacy as part of the process.

Part III, "Profession-Level Transformation," is the shortest section with three chapters that focus on changes to the profession, including the framework's applicability to community college libraries, diverse communities, and reluctant professionals. Are junior colleges different from universities? Are different instructional identities required considering the biases and -isms that students may encounter? Should instructors bring their own personal experiences to the classroom? These three chapters are particularly impactful to all of those in the academic library world as they discuss issues that apply to a variety of environments, populations, learning formats.

Like the first volume in this series *Instructional Identities and Information Literacy*, Volume 2 is a wonderful tool for any instruction librarian working in an academic setting. Contributors' experiences present diverse perspectives on transformative learning theory, applicable to not only libraries, but other academic units. Mezirow's transformative learning theory in conjunction with ACRL's Framework for Information Literacy in Higher Education provides a toolbox for educators use in developing their own instructional identities. This volume would be at home on the shelf of any academic instructional librarian, especially those who

are looking to make a change or reflect on their own department or institutions' instructional identity, as well as in the library collection of any university with a library and information science program.— *Stephanie Cicero, Interim Library Director/Research and Instruction Librarian Roberts Wesleyan University*

Leading Dynamic Information Literacy Programs: Best Practices and Stories from Instruction Coordinators. Anne C. Behler, ed. Milton Park, UK: Routledge, 2023. 186 p. Paper, $48.99 (ISBN: 978-0-3674-6279-6).



Before and since the COVID-19 pandemic, information literacy (IL) instruction has had to evolve in the face of new and existing challenges. Edited by Anne C. Behler, *Leading Dynamic Information Literacy Programs* addresses these challenges through a selection of case studies from various IL coordinators who develop, evaluate, and implement IL programs. The volume is divided into five major subject areas: situating IL in higher education (Part I), building a community around IL (Part II), integrating IL into curriculum (Part III), assessing and improving IL programs (Part IV), and innovating IL structures and practices (Part V).

In Part I, Maybee traces the history of alternatives to IL, including transliteracy, media literacy and digital literacy. Despite these alternatives, IL continues to reign supreme, as evidenced by the ACRL *Framework for IL in Higher Education* published in 2015. While the *Framework* acts as a helpful starting point, Maybee offers insights from the field of "critical pedagogy" (p. 19) with the goal of better preparing learners to navigate the modern information landscape. In the following chapter, MacDonald frames IL as a means of developing the "educated citizen" (p. 27). In this way, IL coordinators could position their work as a required component of higher education which would be a useful bargaining chip in conversations with administrators who are unsure of the library's place in the institution.

Waltz opens Part II by using the analogy of a "junk drawer" (p. 46) to describe community sentiments around IL. Much like a messy kitchen drawer, the work of IL can feel nebulous and disorderly for many in academic libraries. To reorganize the drawer, Waltz emphasizes the importance of delineating the roles of everyone involved in IL and how their work contributes to the larger vision for the institution. Similarly, in the subsequent chapter, Gammons et al. share a case study from the University of Maryland where IL instruction was struggling due to being isolated as a single unit; the chapter authors propose communities of practice as a solution. These groups empower library staff and other campus stakeholders to cultivate a community of questioning, learning, and practicing as it relates to IL.

Part III continues the discussion with Wightman advocating for curriculum development and design roles to be integrated into the work of academic libraries. Strategically speaking, the library can play a more integral part in student success when integrating IL instruction into curriculum development at the institutional level. For this assimilation process to be effective, libraries should take a multi-modal approach to IL instruction, as the next chapter explores. If librarians want to avoid being perceived as "tedious and repetitive" (p. 101), they should heed Cook's recommendation to diversify how IL is delivered, including instruction that is both responsive to student needs and offered incrementally, unlike the traditional one-shot model.

Part IV sees Kirker and Blinstrub delve into the assessment of IL programs to determine if students, faculty, and librarians are meeting expectations and goals. While assessment typically exists to evaluate student learning, it is also important to assess the teaching practices of information literacy instructors. The authors provide a practical toolkit where they plot examples of assessments along a four-stage "curriculum map" (p. 130), with each stage growing in complexity compared to the last. The recommendations offered in this chapter could propel the library toward being more adaptable and responsive to the changing objectives and values of its home institution.

Lastly, in Part V, Brown and Souza-Mort explore IL innovations at Bristol Community College. Other IL instructors and coordinators will find their suggestions of "chasers" and "multi-sessions" (p. 139) easily applicable to their own professional practice. Librarians who might feel reluctance would benefit from the adventurousness and willingness to fail that Brown and Souza-Mort embody in this chapter. Closing out the text, Behler investigates how Penn State University paused IL instruction to revitalize the program. This reboot process enabled the library to renew its vision for IL and to determine how IL instruction can be done more strategically. This chapter implores readers to be adaptable, because libraries and IL programs must be able to "pivot" (p. 160) in the face of institutional changes or even global pandemics.

The strength of *Leading Dynamic Information Literacy Programs* lies in its practicality, sharing vignettes of real-world IL programs from which readers can glean useful nuggets of information. Newcomers to the field of IL will benefit most from Parts I and III. Part I serves as a foundational piece for those who want to acquaint themselves with the current state of IL in higher education, while Part III offers aspirational goals for how IL can manifest in curriculum. Parts II, IV and V might be of most interest to veterans who are seeking to breathe new life into the community, culture, and structure of IL in their own institutions. The introduction concisely describes Dyson's "four ways" (p. 1) of library instruction, but the text could have taken a deeper dive into the current trends in IL programs—future editions might include a summary table that outlines the most popular IL instruction methods and their key characteristics, with notes indicating how the chapter authors embody these methods. Overall, readers will appreciate Behler's organization of the text and the bite-sized case studies in each chapter, allowing readers to easily pick up and put down the book at their leisure.

As Waltz asserts, "every academic library deals with instabilities" (p. 46) when it comes to IL. These uncertainties can stem from changing priorities in higher education, strained student and faculty relations, or the library's culture. Behler and the chapter contributors expertly address these concerns, sharing their stories of hardship and success in a digestible manner with a focus on feasibility. Whether experienced or new to the field of IL, coordinators and instructors alike will find the stories shared in this volume valuable in innovating or grounding their IL practice. — *Aleksandar Golijanin, York University Libraries*

Delivering the Visitor Experience: How to Create, Manage and Develop an Unforgettable Visitor Experience at Your Museum, Rachel Mackay, Facet Publishing, 2023. 224p. Softcover, $40.98. 9781783305490

Working in visitor focused roles since she was sixteen, serving as a consultant for various projects and institutions, such as the Jewish Museum London, and named as one of the world's top fifty museum influencers in 2020, Rachel Mackay has twenty years of experience working with museums and heritage organizations. Her new book outlines how museums can offer a

patron-centered experience from development to opening debut and through the duration of an exhibition. Divided into three sections, *Delivering the Visitor Experience: How to Create, Manage and Develop an Unforgettable Visitor Experience at Your Museum* starts with defining what a visitor experience is. Mackay writes, "for me, Visitor Experience is the name given to the people in the museum who look after the overall on-site visitor journey, ensuring that people who come to visit our museums have a safe, easy and enjoyable visit" (p. xvii). *Delivering the Visitor Experience* guides museums through the process of creating a notable user experience at a heritage institute.

The book is written for a managerial audience in an easy-to-digest manner. While Mackay's book focuses on UK museums, using acronyms and laws that are specific to Great Britain, content can extend beyond Europe and apply to any related setting. Topics such as forming hiring committees with diverse members, or inspiring a passion for learning in employees may not be traditionally included during the planning and implementation of an exhibition; Mackay, however, emphasizes such topics importance. Mackay argues that it is imperative to the success of a museum not only to attract and hire the right candidates, but to provide onboarding that properly imparts the museum's mission and vision to new employees from their first day. She emphasizes that you cannot replace a paid position with a volunteer, because an employee will be more committed to the museum's values. Finding the right mix of employees is vital to the museum's operation—a crucial point that Mackay explores in the book, describing a variety of situations and concerns at length.

Delivering the Visitor Experience packs in a lot of information while also managing to avoid becoming a dry textbook by including case studies, as well as Mackay's anecdotal experiences. Examples are typically short and to the point, highlighting and underlining the chapter's main concept. The case studies provide solid background information to give proper context and include situations from a range of institutions—larger museums and smaller heritage institutions. In the case study of Mary Rose Museum, a museum that focuses specifically on King Henry VIII's warship relics, the importance of advocacy and how it plays into the visitor experience is stressed. Mackay writes, "by going through those three phases [creating, managing and developing the experience]; doing the legwork of learning from other organisations, gathering evidence from visitor feedback and co-ordinating a response from management team, [the museum] was able to advocate for the visitor and improve the overall experience" (p. 126).

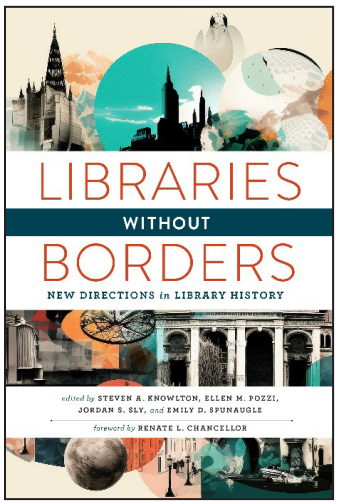
Many academic institutions oversee or have close affiliations with galleries, libraries, archives, and museums (GLAMs) at their institutes. For example, the University of Calgary houses archives, a library system supporting research and the curriculum, a military museum, and an exhibit gallery under its domain. Because museums are under the GLAM aegis, they reflect many of the same tenants as librarianship. Seeing work as a collaboration between staff, volunteers, trustees and the audience illustrates the need for all parties to work together to create a memorable user experience (p. 139), which is similar to how library departments coordinate work to provide patrons with comprehensive services and resources.

There is also a strong focus on soft skills; throughout the book Mackay notes that the staff can be taught the content of the job, but that soft skills should be sought out when hir-

ing. Mackay suggests making positions accessible by not requiring master's degrees, which generally emphasize tangible, hard skills. Hiring workers who have a passion for learning (a soft skill) is more important than technical requirements, which can be taught. Mackay writes, "Visitor Experience was seen as the way into a museum career, rather than a specialism in itself" (p. 179).

Mackay ties everything back to the user experience; she states, "museums and cultural organisations exist not just to preserve the past, but to have an impact on the future through inspiring change in their visitors" (p. 85). In *Delivering the Visitor* Experience, Mackay offers an engaging, comprehensive guide to building and enhancing the museum visitor's experience. In addition, the formatting of the book is done well with charts and diagrams used necessarily when illustrating particular points. The eBook format is interactive, with the contents of the book appearing on the left-hand side in a non-intrusive manner. *Delivering the Visitor Experience* will be useful to any institution interested in putting together an unforgettable gallery presentation. — *Kaia MacLeod, Indigenous Cataloguing Librarian, University of Calgary*

Libraries Without Borders: New Directions in Library History, Steven A. Knowlton, Ellen M. Pozzi, Jordan S. Sly, and Emily D. Spunaugle (eds.), ALA Editions, 2023. 216p. $69.99. 9780838936634



From calls for censorship of library materials to debates over community inclusion and confronting racial injustice, libraries in the United States face considerable challenges today. *Libraries Without Borders: New Directions in Library History*, from ALA Editions, provides instructive historical context to these and other current conflicts. Collectively, the essays in this book present a discussion of the evolving ways libraries have defined themselves through their communities, collections, services, and social responsibilities.

The book is an outgrowth of the 2021 Library History Seminar, sponsored by the Library History Round Table of the ALA, designed around the theme of Libraries without Borders. As the editors describe in their introduction, the theme encouraged authors to consider how libraries, or rather the people involved in running libraries, worked across defined boundaries to extend services and information through their communities, redefining those borders in the process. Because of its own historical context, *Libraries Without Borders* itself stands as an example of how librarians pushed beyond the limitations sometimes inherent in librarianship. The conference was first scheduled for August 2020, and as conference organizer Bernadette Lear describes in the book's afterword, pandemic travel restrictions meant the conference met virtually, but a year later than scheduled. Additionally, as the 2020 George Floyd protests prompted conversations on race in America, conference organizers chose to continue the conversation into the history of library institutions, as seen in Renate Chancellor's keynote essay.

The book's organization follows these library borders in four parts, arranged almost concentrically, narrowing from the outside in. Part one, "Community Formation and Centers of Literacy," looks at the creation of new libraries in response to community needs, in part by defining the locale and the population served. Chapters here examine how libraries choose what to collect and promote, in the cases of advocacy for local public libraries in the 1960s

Civil Rights era, and collections outreach to build a new Catholic library in the 20th century. Part two brings the boundary within the walls of the library and its host institution, looking at the expansion of a new library service (bibliographic instruction) in academic libraries. Part three, "Boundary-setting and Conflicts in Library History," reviews debates within LIS around the social responsibilities to promote equity in access, specifically conflicts over the public perception of library fines and library anti-censorship advocacy. Part four positions the boundary within the practice of library history itself with a how-to chapter on conducting library history research and a necessary critique of the lack of diversity in voices represented in LIS history.

The primary strength of this collection is its placing contemporary challenges within an historical context. Renate Chancellor's forward, adapted from the conference's keynote address, sets the collection's tone, critically examining how LIS as a profession has advanced or ignored equity and social justice. Turning attention on ALA itself, Chancellor traces a history from state library associations' exclusion of Black, Indigenous, and People of Color (BIPOC) librarians in the twentieth century to today's calls for removal of books featuring the experiences of BIPOC individuals. Chapter one, "Locating Activism and Memory," also examines libraries' roles in devaluing or preserving knowledge from African American communities, specifically by sharing and situating narratives of library advocacy from the Civil Rights era. Addressing the similar challenge of confronting censorship, Emily D. Spunaugle's chapter, "Defining the Boundaries of Propaganda," examines how librarians—from small public libraries to the Library of Congress—tried to ease governmental restrictions on information from foreign countries in the 1930s-1950s. Kelly Hangauer's chapter, "Uncharted Waters," explores the development of bibliographic instruction as a new service in academic libraries, echoing ways librarians today navigate how instruction services should respond to generative AI and other changes in the information landscape.

An additional strength of this book is its breadth not only of content, but also methodology. A tour through the chapters is a demonstration of the wide range of methodological approaches currently used in LIS historical scholarship. Chapter one for example, mentioned above, applies an autoethnographic approach, looking at authors' family histories or micronarratives. The next chapter, by Henry Handley, uses a more traditional archival approach, reviewing correspondence and newsletters to describe how a Catholic research center built its collection through targeted outreach. John DeLooper applies another creative approach in "Better Late than Never," analyzing media narratives of fine enforcement and returns of long-overdue materials to better understand how patrons perceive library practices and policies. The book ends with an example of critical historiography, in which authors Loriene Roy and Rea N. Simmons note the ways BIPOC voices have been sidelined in library history; they make efforts to rectify this by incorporating numerous examples of indigenous librarians, past and present, whose stories should be told to enrich LIS literature.

This book is highly recommended for LIS educational programs as well as academic libraries more broadly. It may be too library-specific for general collections, but it is a valuable read for any librarian interested in conducting historical research. Overall, it stands as a valuable and timely contribution to the understanding of how libraries evolve to meet the times and needs of their communities. — *John Taylor, United States Institute of Peace Librarian George Washington University Libraries & Academic Innovation*