Diversified Research Methods Education in LIS: Thinking Outside the Box

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A small number of LIS degree programs have adopted a diversified approach to research methods education, including offering an array of specialized research methods courses in addition to a general introductory course. The current study conducted an in-depth investigation of the diversified research methods curriculum of the LIS program at San Jose State University. The curriculum featured ten different research methods courses, and permitted students to make a selection to fulfill the requirement. Students tended to base their selections on individual interests, and reported a high level of satisfaction with their learning experience. The current study examined different aspects of the diversified curriculum from the student perspective, and reviewed the implications of this curricular model.

Keywords: research methods, LIS education, LIS programs, LIS curriculum

Introduction

In Library and Information Science (LIS), researchers and practitioners traditionally acknowledge the importance of research to practice. According to Jarvis (1999), research should seek "in a most rigorous manner, to understand and create efficient working practice" (p. xi), should create new knowledge and, therefore, should contribute to the growth of LIS as a profession (Powell, Baker, & Mika, 2002). Research methods education is indispensable in preparing LIS practitioners for research, developing a culture that nurtures and offers opportunities for research, and facilitating the connection between research and practice (Haddow & Klobas, 2004). In April 2016, of the 53 ALA-accredited LIS degree programs that offered online information on degree requirements, 62.3% required research methods, while 7.5% either offered the class among a cluster of others from which students could choose or strongly recommended the course as an option. Even though the majority of the programs mandated research methods education, LIS practitioners are often inadequately prepared when conducting research at work. Librarians list unfamiliarity with the research process, lack of confidence, and insufficient knowledge on research methods among the obstacles that hinder their engagement in research (Haddow & Klobas, 2004; Kennedy & Brancolini, 2012). This discrepancy demands reflection on the teaching and learning of research methods in LIS education. As educators, it is imperative that we constantly examine and properly adjust the research methods curriculum to meet the needs of future LIS practitioners.

Library and Information Science is an expansive field that covers a wide variety of domains; thus, graduates of LIS degree programs may gain employment in diverse settings where the culture and practice of research may vary greatly. Consequently, the most appropriate research methods education may depend on the specific professional domain pursued by individual students. While traditional LIS degree programs offer only one course that provides an introductory overview of frequently used methods for data collection and analysis, a small number of programs

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now consider students' diverse needs and offer an assortment of research methods courses with varying foci. These programs include:

- The University of Oklahoma offers two courses, one of which provides a general introduction to research methods, while the other focuses on evaluative research.
- The University of Michigan features eight courses, including Empirical Methods for Health Informatics, Introduction to Statistics and Data Analysis, Microeconomics, Game Theory, Data Manipulation, Exploratory Data Analysis, Needs Assessment and Usability Evaluation, and Research Methods for Information Professionals.
- San Jose State University delivers 10 courses, including General Overview of LIS Research Methods, Research in Youth Services, Evaluating Programs and Services, Action Research, Survey Research, Historic Research and Writing, Ethnography, Assessment of Information Literacy Instruction, Grant Writing and Records Management, and Archival Research.

This diversified approach is an attempt by LIS educators to think outside the box by making research methods classes more relevant. The approach provides students with wider exposure to LIS research and methodology, and prepares them for the varying types of applied research they may need in their future careers. Focusing on the case of San Jose State University's School of Information, the current study involved a detailed examination and evaluation of the new curricular model, which produced a microscopic view of the way in which the diversified research curriculum fulfilled student needs. Hopefully, this work will generate ideas for further discussion on enhancing LIS research methods education, and assist educators and researchers in making informed decisions on research methods curricular development.

Literature Review

Research is "an inquiry process that has specific components" (Hernon, 2001, p. 81), including reflective inquiry (problem statement, literature review, and theoretical framework, logical structure, objectives, and research questions, and hypotheses), procedures (research design and methods of data collection), data gathering/processing/analysis, issues of reliability and validity of study, and presentation of findings. Numerous studies (Bodi, 2002; Fister, 1992, 1993; Lenox, 1985; Luo, 2011; Perkins & Helbig, 2008; Perkins & Slowik, 2013) attest to the importance of research in the advancement of the LIS profession, and offer abundant evidence that research skills such as reference consultations, information literacy instruction, evaluation and management, and promotion and tenure play an important role in LIS practice. Research can improve problem solving and decision making in the workplace, make LIS practitioners critical consumers of the research literature, and equip them to provide optimal information services to researchers in other fields at the individual, organization, professional, and national levels (Neal, 2006; Powell *et al.*, 2002). The specific benefits of engaging in research are also well-documented. These benefits include job promotion, personal acknowledgement, enriched relationships with teaching faculty, increased ability to change and identify/solve problems, and improve library services and programs (Luo, 2011; Perkins & Slowik, 2013).

Despite disciplines within LIS recognizing the value of research, there is still a gap between LIS research and practice. One study analyzed the contents of 1,880 articles in LIS journals and found that only 16% qualified as research (Turcios, Agarwal, & Watkins, 2014). Some academics suggested the need for more research on overcoming the barriers to conducting and applying research in LIS practice, which might gradually bridge the research-practice gap (Chu, 2015). The 2016 Annual

Conference of the Association of Library and Information Science Education dedicated its prestigious President's Panel to this issue from both the researchers' and the practitioners' perspectives (Stephens, Abbas, Garnar, Kennedy, Kenney, & Luo, 2016). One theme that arose from the panel discussion was the need to establish a mutual understanding and definition of research among researchers and practitioners to facilitate better communication. A reasonable path leading to such mutual understanding was research methods education in the professional preparation of LIS practitioners. Offering formal research methods courses in LIS degree programs could enhance practitioners' understanding and appreciation of the practical value of research and equip them with necessary knowledge/skills to interpret/conduct research to solve problems at work (Stoan, 1984).

One prominent area in the literature on research methods education in LIS was curriculum and pedagogy. Surveying instructors in ALA-accredited LIS schools, Stephenson (1990) and Smith and Adams (1992) derived similar findings on the topical coverage in research methods courses. Both found that most instructors required evaluation of research articles and provided basic research methodologies and statistical skills, while about half made practical research experience a mandatory component in the curriculum. In comparing LIS programs in Korea and the US, Park (2004) examined the topics covered in research methods education. Her findings indicated that, while the range of topics covered in Korean research methods courses needed expansion, those in the United States required greater depth of coverage.

Perkins and Helbig (2008) analyzed research methods course syllabi from 25 ALA-accredited programs and provided a detailed break-down of 45 methodological topics taught in those courses. Their findings revealed that the three most frequently covered topics in research methods courses were quantitative research methods/data analysis, critical evaluation of the literature, and written research papers/plans. Regarding research methods pedagogy, Chang and Siao (2012) discussed the development of e-learning materials and the use of those methods in a LIS research methods course, while Ondrusek, Thiele, and Yang (2014) analyzed abstracts written by LIS students for their research proposals. A one-way analysis of variance (ANOVA) detected significantly higher scores in areas related to fluency of description in the research design and the required elements of a research proposal in groups with greater exposure to working examples.

Another notable premise in the literature was the efficacy of research methods courses. To examine the students' perceptions of research methods courses at Brigham Young University, Staples (1982) surveyed library school graduates and found that half had a general understanding of research and research methods, and most used research skills to derive data for problem solving at least once. Student suggestions for improving the curriculum included having more time to complete research projects, adding the requirement of a publishable article, and providing more comprehensive statistics instruction. In addition, Perkins and Helbig (2008) surveyed LIS journal authors regarding their perceptions of the usefulness of the 45 topics identified from research course syllabi to their professional work and found that the three most useful topics were the critical evaluation of literature, written research paper/plan, and the scholarly publication process. The same population cited the three least useful topics as quasi/experimental design, global applications, and multivariate analysis.

In a 2002 study, Powell, Baker and Mika (2002) investigated LIS practitioners' involvement in research with findings revealing that almost 90% of LIS practitioners regularly read at least one research journal, nearly 62% regularly read

research-based articles, approximately 50% occasionally applied research results to professional practices, and 42% occasionally or frequently conducted research related to their job or to the LIS profession. The study also identified factors related to practitioners' research involvement. According to participants, conducting and reading research positively associated with the number of educational activities about research methods, but had no correlation with whether their master's program offered adequate preparation. Luo (2011) conducted a nationwide survey among librarians about the impact of research methods education on their professional practices, and concluded that the research methods course was a valuable component of the MLIS program. Taking the research methods course increased LIS practitioners' research interests and assisted many aspects of their work, such as critically evaluating published literature for application at work, providing better assistance to library users, producing valid and reliable data to facilitate decision making, identifying problems at work and designing studies to solve them, and writing grants and for publication.

In addition to studies on LIS preparation, some researchers investigated the importance of research methods education in other fields, such as psychology, sociology, theological education, and business. Wagner, Garner, and Kawulich (2011) reviewed 195 articles published in 61 journals over a 10-year period to describe the state of the state of the art of teaching research methods in the social sciences. They identified three areas on which future efforts should focus: (a) the role and desirable characteristics of a research methods teacher, (b) the challenges of teaching and learning specific aspects of research methods, and (c) commonalities and differences in research methods among disciplines. In another review of literature on research methods teaching and learning, Earley (2014) examined 89 studies and found the literature focused on the characteristics of students taking a research methods course, teaching methods and techniques, and content and course goals. The lack of research on assessment and student learning created a gap in the literature on research methods courses.

Building on the existing literature, the current study provides an in-depth view of an emerging curricular model that employs a diversified approach to research methods education. It is anticipated that this new knowledge will enrich the understanding of effective teaching in LIS degree programs and, thus, make a unique contribution to the literature on research methods courses.

Description of Diversified Research Methods Curriculum and Study Design

Research Methods is a required course at LIS program at San Jose State University with 10 different research methods courses currently offered on a regular basis. Four of the 10 courses offered every semester include General Overview, Evaluating Programs and Services, Action Research, and Survey Research. The other six are available only once each year, either in the spring or in the fall, due to limitations on instructor availability. Because the LIS program at San Jose State University offers only online courses, all Research Methods courses are entirely online.

Students may take any of the 10 research methods courses to fulfill the requirement, based on their interests, backgrounds, and professional pursuits. For example, if students intend to work with young people in public libraries, they may select the course that introduces the theory and methods of planning and evaluating youth services. On the other hand, if students majored in psychology or sociology as an undergraduate and already have a strong knowledge base in quantitative methods, they might prefer a course focused on qualitative methods like ethnography. Students may enroll in

the research methods course twice for two specializations to expand their repertoire of research knowledge and skills.

Despite the different foci, each of the research methods courses shares four common components:

- The same course-level learning objectives that students should acquire upon completion of the course. The learning objectives include the ability to: (a) Understand the difference between primary and secondary research; (b) Demonstrate knowledge of fundamental principles and processes of conducting research; (c) Articulate the research method(s) covered in the course, appropriately apply them, and understand their strengths and liabilities; and (d) Understand appropriate data collection/analysis tools, and ethical concerns related to research.
- The same program-level competency that students should master upon graduating from the program includes demonstrating a grasp of quantitative and qualitative research methods, the skill to design a research project, and the ability to evaluate and synthesize research literature.
- The same research ethics assignment that accounts for 5% of the total grade, which includes completion of the Collaborative Institutional Training Initiative (CITI) online workshop titled *Students conducting no more than minimal risk researc*h. All San José State University faculty and students

Table 1. Research Methods Courses Offered by the LIS Program at San Jose State University.

Course Focus	Course Description
General Overview	Introduces the research methods frequently used in conducting Library and Information Science research.
Research in Youth Services	Introduces research methods focusing on application in youth research, and critically examining the issues surrounding research involving youth.
Evaluating Programs and Services	Covers research methods most often used to evaluate and assess services in public, academic, and special libraries as well as information agencies.
Action Research	Introduces action research methods that further learning and improve situations within professional settings.
Survey Research	Focuses on the survey research method, one of the most frequently used methods in library and information science research.
Historic Research and Writing	Explores the ways in which historians frame research questions, assess current literature on historical topics, locate and critically use primary and secondary sources, and formulate viable and worthwhile research projects.
Ethnography	Introduces ethnographic research, particularly through the use of technology.
Assessment of Information Literacy Instruction	Introduces research methods in evaluating and assessing the teaching and learning of information literacy.
Needs Assessment and Grant Research	Introduces widely used methodologies for needs assessment and writing grant applications.
Records Management and Archival Research	Offers an overview of research methods in the social sciences and their application to research about and within archives and records centers.

intending to do research with living human subjects must complete this workshop.
- For courses focusing on specialized topics instead of a general overview, a mandatory lecture briefly introduces frequently used methods and designs in LIS research.

Ultimately, these shared components, developed and finalized by all research methods instructors, ensured a broad level of curricular consistency. In addition, the university had a research methods curriculum coordinator, whose responsibilities included facilitating communications among instructors, providing support throughout the semester, and conducting curricular reviews every five years to ensure the currency and relevance of the curriculum.

In March 2016, with the approval of San Jose State University's Institutional Review Board, previous research methods students participated in an anonymous online survey to examine their perceptions of and experience with this diversified curricular approach. The main variables investigated in the survey are in Table 2 below. For each variable, the table also shows the survey question(s) measuring that variable.

The survey served as the data collection method based on three determining factors: (a) the study would quantitatively measure variations in perceptions and experience; (b) the self-administered survey was appropriate to reach as many students as possible; and (c) there was enough evidence in the literature and in the author's informal observations to describe the variation for each variable and develop ade-

Table 2. Variables Measured in the Survey and the Corresponding Survey Questions.

Variable	Survey Questions
Topical focus of the research methods course the students selected	Have you taken INFO (or MARA) 285 Research Methods in Library and Information Science (LIS) yet?
	What is the topical focus of the 285 section you took (are taking)?
Reasons for selecting the particular course	What was the main reason for you to choose the 285 section identified above?
Overall satisfaction with the course	How satisfied are you with your overall learning experience in 285?
Benefits of the course	Have you had a chance to use what you learned in 285 to benefit your study or work?
	What are the benefits of 285 you have experienced?
Impact of the course on their interest in research	Has taken 285 increased your interest in research?
Additional topics for the research methods curriculum	Is there any topical focus that you think should be added to the offerings of 285?
Suggestions for improving the curriculum	Please provide any suggestions you may have to improve the curriculum of INFO 285.
Demographics	Which of the following the career pathways, as listed on the page of iSchool Career Pathways, are you most interested in pursuing?
	Which of the following statements best describes your current status in terms of professional practice in the field of LIS?

Table 3. Frequency Distribution of Research Methods Course Selections.

Course Focus	% of Respondents Taking the Course
General Overview	29.5
Evaluating Programs and Services	17.5
Historic Research and Writing	16.3
Survey Research	10.4
Action Research	10.0
Research in Youth Services	6.0
Records Management and Archival Research	5.2
Ethnography	3.2
Assessment of Information Literacy Instruction	1.2
Grant Writing	0.8

quate response categories for each survey question.

The development of the survey questionnaire underwent three stages. The first stage involved examination of relevant literature and curricular documents to finalize the variables and draft the corresponding survey questions. Following the first draft, the researcher scrutinized the questionnaire based on the basic survey design rules discussed in Fink (2016). At the second stage, the survey questionnaire went to all Research Methods instructors for feedback. After revision based on their input, the instructors agreed that the survey questions represented proper measurement of the variables, which established face validity and content validity of the instrument. At the third and final stage, the survey was pilot tested by two student assistants and received minor revision based on their suggestions.

Purposeful sampling controlled defining and recruiting the survey respondents. Only current or previous students in the research methods course by the time of the survey made up the sample. Students who had not taken the course or received a waiver could not participate.

The online survey was administered via Qualtrics, a commercial online survey service. An email including the survey link went to the student listserv, inviting those meeting the inclusion criteria to participate. The survey was available online for three weeks. A week before the survey closed, students received a reminder to encourage more participation.

To analyze the survey data, the researcher employed the Statistical Package for Social Sciences (SPSS) to examine responses to closed questions. Frequency distribution and central tendency measures aided univariate analysis with PRE measure Lambda used for bivariate analysis. The researcher conducted applied thematic analysis to examine responses to open-ended questions.

Results

The survey produced 266 valid survey responses of which 64.7% were from previous students and 35.3% from current students. As shown in Table 3, the course that offered a general overview of research methods was the most popular among students. The popularity of the courses likely related to the frequency of offering—the top five most popular courses are available every semester with the remaining courses offered only once every one or two years.

Table 4 indicates that interest in the subject matter and relevance to their career pursuits ranked first and second as

Table 4. Reasons for Selecting a Specific Research Methods Course.

Reasons for Selecting a Specific Course Focus	% of Respondents
I was interested in the topic of the section.	34.0
The section was relevant to the career path I hope to pursue/current work.	26.1
It was the only section I could get in.	11.9
I liked the instructor/syllabus/assignments.	8.7
It was a rather random choice as I had no particular leaning toward any section.	6.7
The section was highly recommended by my peers.	5.9
I did not like any of the other sections offered concurrently.	2.8
I got into the section involuntarily because of registration mistakes or class cancelations.	1.6
I chose the section because it was offered in the intensive 8-week format instead of the regular 16-week format, which was a better fit for my schedule.	1.6
Other (a combination of reasons)	0.8

reasons for students' choice of a particular Research Methods Course.

Overall, students expressed satisfaction with their learning experience in their selected Research Methods course. They rated their level of satisfaction on a five point Likert scale, wherein 5 represented Very Satisfied, and 1 represented Very Dissatisfied. The average satisfaction rating was 3.9, and almost 70% of the students selected 4 or 5 to indicate their satisfaction level, as shown in Figure 1.

When asked whether they had used what they learned in the Research Methods course to benefit their study or work, 43.7% of the students responded affirmatively. As indicated in Table 5, the most recognized benefit was the ability to interpret research readings in their coursework.

While 59.5% of the students indicated that their interest in research improved after taking the Research Methods course, 40.5% reported no change, some of whom explained that they were already quite interested in research and the course itself simply did not have much influence on their pre-existing interest level. Among those with an increased level of research interest, 57.1% felt they had greater interest in reading research articles to advance

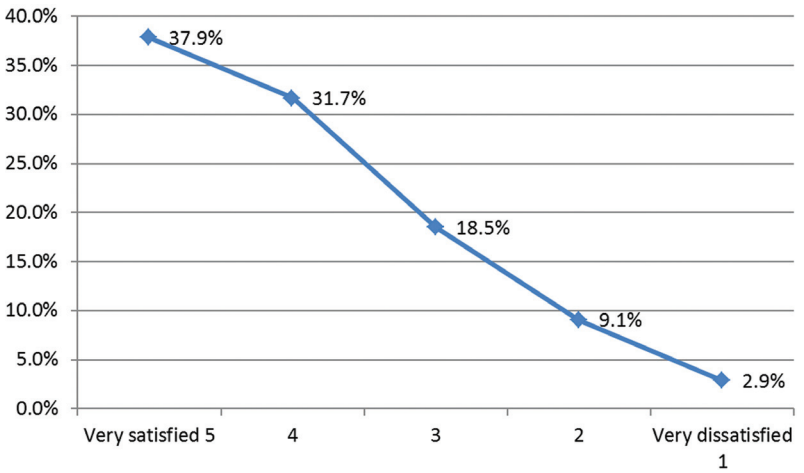

Figure 1. Students' satisfaction with their learning experience in the research methods course.

Table 5. Benefits of Taking the Research Methods Course.

Benefits of the Research Methods Course	% of Respondents
I'm now able to interpret research articles that I'm assigned to read in other classes.	63.0
I used what I learned to design studies or projects required in other classes.	41.7
I used what I learned to evaluate published research findings more critically to inform decisions at work.	39.8
I used what I learned to conduct studies to gather original data to improve practice at work.	32.4
I used what I learned to help write grant proposals or research proposals at work.	12.0
I had an opportunity to carry out the study described in the research proposal I wrote for 285.	12.0
My capability to write and publish improved as a result of the class.	3.7
I feel more prepared and confident to engage in research if opportunities arise in the future.	2.8
I gained a new perspective about conducting research.	0.9

their professional knowledge, 47.6% shared that they acquired interest in using published research findings to inform decision making at work, 51.0% revealed interest in conducting research studies to generate evidence that could help improve practice, 2.0% reported a heightened interest in research writing and publishing, and 1.4% noted more interest in helping others with their research work.

Students that responded to the survey had a variety of career pathways. To introduce students to various careers and help students with career planning and course selection, the LIS program at San Jose State University identified thirteen career pathways to represent the diverse career directions students might follow with their MLIS degree. Table 6 provides an overview of the student interest distribution across various career pathways.

When asked about their work status, more than 60% of the students responded that they worked full-time or part-time in the field of LIS, as shown in Table 7.

To understand student experiences with the Research Methods courses, a number of bivariate analyses determined whether the topics of the Research Methods courses correlated with five other variables. The PRE measure Lambda served as analysis. As shown in Table 8, the resulting Lambda values were small, indicating that the bivariate relationships examined in the study were weak. In other words, students' overall satisfaction with their learning experience in the course, including whether their research interest increased after taking the course, whether they used what they learned from the course to benefit their study or work, their intended career pathway, and their status in terms of professional practice in the field of LIS, had little to do with the topic of the Research Methods course.

To enrich the Research Methods curriculum, the survey asked students to suggest new topics. Their suggestions included:

- Quantitative research methods, such as data analytics and statistics
- Research related to technology, such as Web security, Web programming, algorithmic bias, virtual worlds, and digital literacy
- Research in the area of information organization (e.g. cataloging, metadata)
- Research related to management, such as strategic planning, trend watching, evidence-based arguments, budget

Table 6. Career Pathways Students Intend to Pursue.

Career Pathway	% of Respondents
Public Librarianship—A Community Hub for Learning and Literacy	18.0
Youth Services	13.4
Management, Digitization, and Preservation of Cultural Heritage and Records (Archival Studies and Records Management)	11.3
Academic Librarianship—The Information and Learning Commons	10.9
Teacher Librarianship	8.8
Special Librarianship	7.5
Information Organization, Description, Analysis, and Retrieval	6.7
Leadership and Management	5.4
Web Programming and Information Architecture	5.0
Digital Services	4.6
Emerging Technologies—Issues and Trends	3.3
Digital Curation	2.9
Information Intermediation and Instruction	2.1

analysis, and evidence gathering for SWOT analysis
- Research practices in schools, such as the school library, or other aspects of the educational community
- Research related to international studies, race, and diversity
- Conducting interdisciplinary research
- Postmodern research methods (This topic was only offered twice and then discontinued because of instructor unavailability. Students suggested a revival as a regular component of the Research Methods curriculum).

In addition to the new topics, students indicated a desire to see two of the currently available topics offered more frequently—Assessment of Information Literacy Instruction and Grant Writing. They also suggested more emphasis on topics, such as: research ethics, citation styles, differences between qualitative and quantitative research, dissemination of research findings, and practical values of the methods in the current courses.

At the end of the survey, students responded to how to make the Research Methods curriculum more effective in meeting their needs. Of the 266 respondents, 68 offered suggestions. Their input identified six main themes.

Table 7. Students' Work Status.

Work Status	% of Respondents
I work full-time in the field of LIS.	39.5
I work part-time in the field of LIS.	21.8
I currently do not work, intern, or volunteer in the field of LIS.	21.8
I intern in the field of LIS.	8.2
I volunteer in the field of LIS.	6.6
I work full-time in a non-LIS field.	2.1

Table 8. Bivariate Analysis Results.

Relationship		Lambda Value
Is there a relationship between:	The topic of the Research Methods course & students' overall satisfaction with their learning experience in the course	0.06
	The topic of the Research Methods course & whether students' research interest increased after taking the course	0.019
	The topic of the Research Methods course & whether students used what they learned from the course to benefit their study or work	0.035
	The topic of the Research Methods course & the career pathway students intended to pursue	0.121
	The topic of the Research Methods course & students' status in terms of professional practice in the field of LIS	0.019

- The Research Methods course needs to be more practical, as indicated by comments like "to make it as practical and hands-on as possible in order to allow students to really practice what they learn," and "unfortunately, a lot of this course [General Overview] seems to be geared towards conducting research in the library field and hopefully getting that research published, which I have no interest in pursuing whatsoever. I wish the course would be more about how to conduct research to support changes in your library, or how read and apply research to your library."
- Students should take the Research Methods course as early as possible, as shown in this comment: "I would suggest that this class [Evaluating Programs and Services] be required in one of the first semesters in the program. The information I'm learning about research would have been very helpful if I had learned it prior to some of my previous classes."
- Consider extending the Research Methods course over two semesters because "it [General Overview] is very difficult to understand; the material is too dense; and it is too hard to learn it all in one semester." Even though students recognize the benefits of the course, taking it in one semester can be daunting, as revealed in this comment, "The curriculum is great, it's just incredibly time consuming. I feel like that fact needs to be addressed. The course workload expectations are written the same as all the other courses, but with learning and doing the major research for the assignments in the course [Historical Research and Writing] it is exceedingly overwhelming."
- The waiver requirement for the Research Methods course needs more flexibility. Currently, if students have a previous graduate degree with a completed a thesis, or passed a graduate level-research methods course within the last five years, they can obtain a waiver. However, departments should consider more flexibility, as indicated in this comment, "I appreciate you're trying to be sure everyone gets a proper grounding in research, but not having to write a thesis for my first master's doesn't mean I'm not a proficient researcher or paper writer: I have written a 20 page research paper pretty much every semester of my higher education career and wrote two theses to get my BAs. I have presented at conferences on the work I have done and written WASC reports on data I have gathered and interpreted. I think taking into account the work we have done in our fields would be a better indication of our research and writing skills."

- Although the different Research Methods courses share the same learning objectives, their workload is not necessarily consistent. It is necessary to ensure more consistency across the curriculum.
- Recommendations on how instructors can improve the teaching of the course, such as offering more specific feedback on assignments, being more thorough in explaining assignment requirements, and providing more guidance on the process of selecting research topics and identifying relevant literature.

Discussion

When choosing from the 10 courses offered in the diversified research methods curriculum at San Jose State University, most students based their decision on individual interest and relevance. More than a third of the students revealed an interest in the course topic, and more than a quarter felt the course was relevant to their current or future career. This finding suggested that, for schools planning to employ the diversified approach to Research Methods education, it would be helpful to conduct preliminary investigation about the types of research that interest students, and the types of careers they intended to pursue after graduation. Such information could inform the design of the curriculum and deliver an array of Research Methods courses that reflect student needs.

The overall impact of the diversified Research Methods curriculum is positive. Close to 70% of the students indicated a high level of satisfaction with their learning experience. After taking the Research Methods course, almost 60% reported a noticeable increase in their interest in reading research articles to advance their professional knowledge, applying research to decision making at work, or conducting research to improve their practice. However, only 43.7% of the students actually used what they learned from the Research Methods course to benefit their study or work. One likely reason was that students tended to take this course toward the end of the MLIS program. Even though they recognized the value of the course, they had little chance to experience the actual benefits in the remainder of the program. Some students lamented this and suggested that the Research Methods course be taken as early as possible. The university could address this area by adding a requirement to the curriculum that mandated taking the Research Methods course in the first year or among the first 18 credits.

Another factor contributing to students' less-than-ideal use of the knowledge learned from the Research Methods course was that the course was not practical enough. Some students felt that the course lacked hands-on practice and placed more focus on the scholarly rather than the applied aspect of research. This is a critical issue in research methods education. In LIS practices, the aim of research is to solve problems. Thus, in teaching the Research Methods course, instructors could position it as a class that teaches problem-solving skills, encourages students to talk to LIS professionals and to identify real-world problems that can be solved by research. Courses could be designed around these problems. Inviting practitioners, especially published authors in practitioner-oriented journals, as guest speakers could also demonstrate the connection between research and practice. Through the practitioners' depictions of their experiences engaging in research to solve problems at work, students might develop a more grounded understanding of the practical value of research. Investigating ways in which the course could be made meaningfully practical should be one of the top priorities for all research methods instructors. A diversified Research Methods curriculum has the advantage of multiple faculty perspectives and may benefit from their collective wisdom and expertise in addressing this priority.

Regardless of which topic students chose when taking the research methods

course, it bore no relationship to their overall satisfaction with their learning experience in the course; whether their research interest increased after taking the course, whether they used knowledge from the course to benefit their study or work, the career pathway they intended to pursue, or their status in terms of professional practice in the field of LIS. This means that no particular course topic stood out. This finding suggested that the diversified Research Methods curriculum was consistent and balanced, which might be because all courses share three key components—course-level learning objectives, program-level learning objectives, and research ethics training requirements.

Yet, as some students pointed out, there were still inconsistences of workload in the different courses. Some courses seemed more time-consuming than others. It might be necessary to explore what led to such perception. Students may take two research methods courses, and their preparedness based on their prior knowledge may influence their learning experience. Or students may form the perception based on conversations with others taking different research methods courses. Once the LIS program identifies the cause of the perceived workload inconsistencies among different courses, the department can address the issue and ensure that all instructors have a mutual understanding regarding the expected workload for students and design their readings/assignments accordingly.

Participants suggested a number of new topics for inclusion in the Research Methods curriculum. A diversified Research Methods curriculum should constantly evolve in response to student needs. Still, it is understandable that a single LIS degree program may not offer all the Research Methods courses students desire due to a lack of faculty expertise. For instance, even though students indicated strong interests in courses focusing on quantitative research, there might not be qualified instructors in the program. In that case, the program might investigate whether other departments on campus (e.g., psychology, sociology, or education) offered courses on quantitative research methods at the graduate level, and if so, allow students to take those courses to fulfill the Research Methods requirement.

In addition to new topics, students commented on revising the waiver requirement, the emphasis in each course, and means of creating a more pleasant learning experience. These suggestions provide useful notions to improve the curriculum and deserve consideration by all instructors. For instance, at San Jose State University, the Research Methods course coordinator could organize regular meetings among the instructors to discuss these suggestions (and other ideas), reflect on the curriculum and pedagogy, and develop ideas to optimize the teaching and learning of research methods that are both actionable and sustainable.

As previously mentioned, at the time of this study, there were only three LIS degree programs that employed a diversified approach to research methods education. These three programs might consider offering some of their specialized research methods courses through the Web-based Information Science Education (WISE) Consortium, and allow students in other LIS programs to enroll. Such exposure could broaden the impact of the diversified curricular model and raise awareness among LIS educators. This study serves as a springboard to encourage more discussion about the model and its successful implementation. Professional organizations, such as the Association of Library and Information Science Education, might consider facilitating such discussions at their annual conferences in order for the LIS research methods curriculum to grow and improve.

Meanwhile, findings of the current study help fill a void in the literature. As discussed in the literature review, Park's (2004) study suggested that topics of the research methods course in the United

States needed greater depth of coverage, and Earley (2014) concluded that the literature lacked research on assessment and student learning in research methods courses. The diversified research methods curriculum described in this study provides a mechanism to offer more in-depth coverage of research methods topics (e.g., ethnography, survey research, historical research, etc.), and the survey of students' experience with and perceptions of the diversified curriculum contributes to bridging the gap identified in Earley (2014).

Limitations

There were limitations in the study that need acknowledgement. First, the study was about the diversified research methods curriculum in one LIS program. Because there are two other LIS schools that also employ this diversified approach, it would be helpful to conduct similar curricular research at those schools, comparing the findings to generate enhanced understanding of the emerging model of research methods education. Secondly, the sample of survey respondents was a purposeful sample, thus limiting the generalizability of the study. Finally, since the focus of the study was to measure variations of students' perceptions of and experiences with the diversified research methods curriculum, it was unlikely to capture a nuanced view. Qualitative methods like focus group interviews might further explorations of this issue.

Conclusion

The drive for offering a variety of research methods courses stems from the fact that students enter the MLIS program from diverse backgrounds and with different interests; thus, the traditional *one size fits all* approach that offers a singular introduction course on Research Methods can hardly meet their needs. This study provides an in-depth examination of the diversified Research Methods curriculum at San Jose State University, which represents an emerging model of research methods education in LIS programs. Findings of the study may help LIS educators develop a solid understanding of the model and encourage outside the box thinking in the design of their own research methods curriculum. Future research may build upon this study and further pedagogical innovations in research methods education.

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