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Research

Developing Competency-Based Assessment for Library Professionals

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The assessment process for student learning is often influenced and guided by well-defined standards and competencies dictated by various accrediting bodies that oversee graduate professional programs culminating in the master's degree. When applied in an accredited library and information science (LIS) program, traditional assessment techniques, such as portfolios, grades, and authentic assessments, consistently affirmed student high performance, leaving little room to demonstrate student learning and program improvement. Consequently, the program redefined its assessment plan through the development of a pre-/post-test survey instrument that aligned with learning outcomes, the curriculum, and professional competencies. Pre-test responses were analyzed through SPSS software to ascertain initial findings and effectiveness of the instrument to gauge student learning and workplace performance. Implications for student advisement, curriculum adjustments, program improvement, and strengthening the assessment plan for accreditation emerged. Areas for further development, particularly in the work environment, and research were also identified.

Introduction

Diverse graduate studies permeate the university landscape. Master's work is often considered the essential, terminal degree for a variety of professional programs that derive their value from accreditation. Respective accrediting organizations, professional associations, or agencies issue standards for programs to follow and competencies for students to achieve. Accreditation is awarded or continued according to how well the master's programs demonstrate compliance to standards and how well students demonstrate achievement of competencies expressed as learning outcomes. Even though many indicators of graduate program quality are already in place, effectively demonstrating student achievement of learning outcomes remains a challenge. This study demonstrates

how library and information science (LIS) educators accepted the challenge by creating a survey instrument aligned to program standards, professional competencies, and courses to assess student learning and isolate areas for program and curriculum improvement required for accreditation. Aligning the survey to professional competencies also opened up the possibility of its ongoing use in the workplace.

Literature Review

Despite being associated with accredited universities, professional graduate programs typically fall under the additional scrutiny of accrediting bodies charged with oversight of specific professions. For example, the Council on Social Work Education (CSWE) monitors social work education, specifically the Master of Social Work (MSW) degree, and the American Library Association (ALA) oversees various master's programs for library science throughout the United States and Canada (Applegate, 2006; Calderon, 2013). Likewise, the National Association of Schools of Public Affairs and Administration (NASPAA) reviews graduate public affairs programs for adherence to specific standards (Powell, Saint-Germain, & Sundstrom, 2014). Evidence offered to accrediting bodies by those in charge of these programs often included items that point to the overall satisfaction or quality of the program perceived by others, generally students, alumni, and employers. Some even pointed to the *U.S. News & World Report* rankings for the program. This survey and ranking data, though, were seen as questionable or insufficient. For instance, while current student entrance and exit survey data can be regarded as reflective of student experiences, alumni data can be outdated or incomplete. Also, the methodology behind college, university, or program rankings is under scrutiny (Applegate, 2006; Rogers & Goktas, 2010). Consequently, even though survey data and faculty accomplishments might be referenced by programs seeking accreditation or reaccreditation, the program now must provide evidence of a continuous outcomes assessment cycle resulting in an improved curriculum to enhance learning. Assessment of student learning and mastery of specific standards and professional competencies are primary (Applegate, 2006; Calderon, 2013; Lattuca, Terenzini, & Volkwein, 2006; Pinto, Fernandez-Ramos, Sanchez, & Meneses, 2013; Powell et al., 2014; Rogers & Goktas, 2010).

A clear, evidenced-based approach to learning outcomes assessment for professional graduate programs has not been previously well-defined in the literature (Applegate, 2006; Brown & Benson, 2005; Burke & Snead, 2014; Rogers & Goktas, 2010), and a recent search of the literature resulted in the same findings. The literature showed a noticeable tension between the types of instruments used for a true, effective measurement of student learning. Direct measurements, such as tests or practical experiences, are accepted by higher education as true, valid demonstrations of what content actually has been learned, and indirect measures are thought of as only indicators that some learning has occurred, even though they provide students the opportunity to think seriously about their learning (Applegate, 2006; Calderon, 2013; Suskie, 2004). One form of indirect measures frequently used by professional graduate programs is the self-assessment survey (Applegate, 2006; Calderon, 2013; Pinto et al., 2013). Students are asked to evaluate their knowledge and abilities related to the program-specific competencies issued by the program's accrediting body, thereby calling for a high level of self-awareness and integrity on the part of the student.

Gathering information from the student's perspective can be valuable since it can indicate levels of motivation and confidence (Pinto et al., 2013). Indirect measures, especially the self-assessment survey, however, are frequently viewed as problematic. While self-assessment instruments can work effectively when students collect and reflect on their performance data on an ongoing basis and compare it to data received from direct measures (Colthart et al., 2008), studies revealed that students, especially weaker students, tend to overestimate their abilities (Calderon, 2013; Colthart et al., 2008; Pinto et al., 2013). Conversely, stronger students tend to underestimate their abilities (Colthart et al., 2008). One reason offered for these tendencies is the degree of the students' metacognitive abilities. Researchers concluded that weaker students are incapable of recognizing their true abilities (Colthart et al., 2008). Calderon's (2013) findings offered another possibility by suggesting that direct and indirect instruments really

measure two different constructs. Direct measures demonstrate actual learning while indirect self-assessment surveys indicate a student's learning experiences. The perception of learning is viewed separately from actual attainment of skills and competencies and the survey may really reflect different aspects, such as satisfaction with more social or emotional experiences during the program. Calderon (2013) concluded that further research is needed to identify the factors related to a student's learning experiences.

Some of the authors reviewed in the literature were investigating the use of self-assessment as one way to meet accreditation requirements (Calderon, 2013; Pinto et al., 2013; Rogers & Goktas, 2010). Others embraced the need for a variety of assessments, both direct and indirect, depending on whether formative or summative data was desired. Student artifacts produced during different stages of the program also proved beneficial (Applegate, 2006; Calderon, 2013; Suskie, 2004). Years ago, Brown and Benson (2005) found value in capstone experiences, whereby students engaged in active learning and applied theory to practice in the chosen profession. In many respects, today's internships are rooted in this practice and remain a valuable way for students to demonstrate their learning.

One conclusion that may be obvious for accredited professional graduate programs is that a variety of assessment measures should provide a complete picture of student learning. The next steps in the cycle, data reviewed at established intervals and adjustments to the curriculum, can easily follow. Improvement in student learning should be the logical result, creating an effective assessment plan to satisfy the accrediting body. However, this is not always the case or easily accomplished by many professional graduate programs. Since entrance requirements for graduate school are demanding and call for a grade point average (GPA) of 3.0 or better, the student population is usually composed of high-performing students with strong scholastic aptitude. For example, no discipline-specific requirements exist, and students from all backgrounds can pursue a library science degree. The main requirement is the GPA of 3.0 or better. This leads to the question: How can a program demonstrate a continuous cycle of assessment leading to improved student learning with a student population that is composed of above average, high performers?

Background

An ALA-accredited graduate library science program in the eastern United States maintains a variety of measures for overall program evaluation for accreditation. Data from entrance and exit surveys of current students, alumni surveys, and employer surveys are gathered and reviewed throughout the seven-year reaccreditation cycle. Assessment of student learning is ongoing and a number of different measures have been attempted, such as portfolios, core course exams, standardized tests, grades, and authentic assessments. The result was always the same: The students performed well, frustrating efforts to show improvement in student learning. Consequently, another attempt was made at creating a more meaningful assessment plan during the current accreditation period.

Enhancing the Plan and Developing the Multi-Subject Learning Survey (MSLS)

The development of the assessment plan for the curriculum and learning outcomes, which includes the Multi-Subject Learning Survey (MSLS), matured over a decade (Department of Library Science, 2010). Previous assessment schemes included the use of portfolios, standardized tests, grades, and authentic assessments. Each of these techniques demonstrated both promise and weaknesses. The use of portfolios had the benefit of authentic assessment but was not implemented because the parent university declined to increase the overall number of credits for the program, which was needed for portfolio review. Administration of a standardized test demonstrated promise but was not able to be implemented at the time due to issues with the outside testing agency. Grades for course-specific authentic assessment artifacts proved not to provide useable data given the limited grade range in

graduate-level courses. A more comprehensive approach to an assessment plan was developed to incorporate a range of evaluative techniques.

The current assessment plan includes

- pre- and post-test administration of the MSLS;
- review of competencies for the program with new students during orientation;
- incorporating competency review in the mandatory advising process each semester;
- a capstone experience including artifact collection;
- an employer survey based on the competencies; and
- incorporation of assessment findings into the annual program-planning process.

In addition, considering the use of a standardized test instrument and integration of the assessment process into an analytics software program are under review. This plan incorporates a number of the earlier elements in addition to newly developed assessment techniques.

One of the new elements to be developed was a survey instrument based on learning competencies. The development of the survey included a review of the learning competencies for the program, mapping accreditation standards to the curriculum/learning objectives, and designing and testing the MSLS instrument. Since the program has a specialty accreditation body, the program standards required by the accrediting body were reviewed for application to learning competencies. An extensive project was completed to map the competencies to the current curriculum and learning objectives to be sure that all competencies were covered within the program and to note specifically which courses were required to cover which competencies. Once these elements were completed, the survey instrument was developed to assess student mastery of the competencies during the program.

This portion of the planning process included development of the MSLS instrument, piloting of the instrument, and deployment procedures. The overall goal of the MSLS was to determine perceived knowledge level specific to program competencies by students who have completed the program. The survey questions were developed using accreditation standards, competencies developed by professional associations, and a review of the questions by subject experts. The structure of the survey instrument was inspired by the Technological Pedagogical Content Knowledge (TPACK) instrument (Koehler & Mishra, 2008). TPACK is a self-assessment instrument designed to measure teacher preparation (Archambault & Crippen, 2009). The TPACK survey structure which queries the respondent's self-assessment of ability in domain-specific competencies was modeled.

Several elements were considered to establish the construct validity of the instrument, that is, the extent to which inferences from the test's scores accurately reflect the construct that the test is claimed to measure (Isaac & Michael, 1995). To develop the survey questions, the initial touchstone was the specialty accrediting body's standards. Those standards were then compared to the *Competency Index for the Library Field* (Gutsche & WebJunction, 2009). This publication is a compilation of competency lists from a variety of professional associations, library practitioners, and leaders including the American Library Association, the Special Libraries Association, and subject specialists (Gutsche & WebJunction, 2009, pp. iii-iv). This approach had the advantage of incorporating significant expert opinion in the competency development. The competencies from the index that correlated to ALA program standards were selected for inclusion in the MSLS. The aligned competencies were then reviewed by six knowledgeable subject experts to ensure that items used were relevant, complete, and structured appropriately. The use of competencies developed by professional organizations (including the accreditation body), practitioners, and subject experts were used to establish an acceptable level of content validity.

The instrument was then piloted to demonstrate that the respondents would correctly interpret what each item asks. Piloting of the instrument was undertaken by using a think-aloud method with library science faculty, administration to a test group of library science students, and administration to a control group of students who were

not in a library science program. The library science faculty think-aloud pilot involved interviewing participants while they read and answered the questions. The faculty explained what they were thinking as they went through each of the questions on the instrument. Responses were compared to ensure that the questions were being interpreted in the same way. The instrument was then administered to 45 students enrolled in a graduate-level library science research methods class. Upon completing the instrument, they evaluated it. The last part of the pilot process involved administering the survey to a graduate-level group of students who were not enrolled in a library science program. This step established that scores from students not in a library science program deviated extensively from students in a library science program, which was the expected outcome on a content-dependent instrument. Only minor editorial changes to the instrument were made based on the pilot testing.

In addition, the parent institution holds regional accreditation. As part of the preparation for an institution-wide accreditation review, the university brought in an assessment consultant to assist departments with their specific efforts and ongoing plans. The consultant considered the following elements in reviewing the library science department plan:

- means of assessment are feasible and appropriate given the time and resources available;
- multiple means of assessment are used;
- sufficient data is collected;
- assessment results are matched to intended outcomes; and
- data collected are meaningful, valuable, and accurate.

The department's assessment plan was reviewed in detail by the consultant who considered the plan to be well-structured and effective (D. G. Underwood, personal communication, February 24, 2014). The consultant's review concluded the development, testing, and review phase of the instrument. Deployment of the survey was next considered. The administration of the instrument was written into course descriptions within the program. The instrument is administered as a diagnostic assessment of students entering the program and, therefore, is included in the required introductory course. The MSLS is administered again as a post-test assessment at the end of the program in the mandatory capstone course.

During the time of development, the parent university became involved in the Association of American Colleges & Universities Liberal Education and America's Promise (LEAP) initiative. Elements of that process were incorporated into the assessment plan. LEAP concepts used for campus assessments include

- orientation for students;
- diagnostic assessment;
- advisor/plan of study;
- alignment of curriculum/advisor review;
- capstone experience; and
- post-test survey.

These elements were included in the assessment plan. The competencies for the program used in the MSLS are reviewed during the new student orientation process. The pre-test administration of the MSLS occurs at the beginning of the introductory course to the program and provides a diagnostic assessment. Progress on attainment of the competencies is reviewed with each student as part of the mandatory advising session held each semester prior to registration. Since a capstone course, involving either an internship (LS570) or research project (LS600), is required as part of the program, the MSLS is administered as a post-test during the capstone course. In addition, a research paper is required in the capstone course, and the paper is collected and evaluated as an evaluative artifact. The paper produced from the internship recaps the learning experiences of the internship, reflects on the effectiveness and

usefulness of course content in relation to the internship, and includes any materials created by students during their experiences. The paper produced from the research project reports on the specific research project conducted by students. It follows the general form of research articles, and students are encouraged to submit them for publication. The results of the assessment plan are then used during the annual program review to inform curricular changes.

The overall assessment plan for the program includes administration of the MSLS; incorporation of the learning competencies in orientation and advising; a capstone experience which includes a major research paper used as an assessment artifact; an employer survey which queries graduates' competency; and a process for incorporating the collected data into an annual program review. The MSLS assessment process addresses and evaluates the educational learning outcomes portion of the program.

Data Analysis

After piloting the MSLS instrument during summer 2012, the library science department decided to administer it to students enrolled in LS504, Introduction to the Information Professions, and either of the capstone courses, LS570, the internship course, or LS600, the research project course, using a pre-test/post-test design. Responses to the 35 items could range from 1 to 6, 1 indicating expert ability and 6 indicating no ability as shown in Table 1.

Table 1

Item Responses

Student response to item	Value for computing mean
Expert	1
Very strong	2
Competent	3
Weak	4
Very weak	5
No ability	6

The pre-test results from Fall 2012 through Summer 2013 were downloaded from each Desire2Learn (D2L) course site and uploaded to the D2L accreditation site maintained by the department. The responses to the 35 survey items for each of the 124 participants were entered into SPSS for analysis. Descriptive statistics and item response frequencies were computed.

Category One: Foundational Principles of Librarianship

This category was designed to capture students' self-assessment of their awareness of and ability with basic principles of librarianship. Items included familiarity with the ALA Bill of Rights and Code of Ethics, intellectual freedom, freedom of information, history of libraries and their role in society, the different types of libraries, the laws

related to libraries, communicating the value of libraries to key stakeholders, contributing to problem solving, and the ability to communicate verbally and in writing. Table 2 records the mean scores and cumulative percentages for the nine items in this category.

Table 2

Scores for Category One: Foundational Principles

Knowledge of/Ability in	Mean scores (n=124)	Expert, Strong, Competent % rating 1-3	Weak, Very Weak, No Ability % rating 4-6
1) Familiarity with ALA Bill of Rights/Code of Ethics; relevance to library services	4.1048	38.7%	61.3%
2) Understand and promote intellectual freedom/freedom of information	3.0242	75.0%	25.0%
3) History of libraries/role in society	3.2016	68.5%	31.5%
4) Types of libraries	2.6452	87.9%	12.1%
5) Openness to new ideas/current trends	2.4435	87.9%	12.1%
6) Know/apply laws pertaining to libraries	3.4194	59.7%	40.3%
7) Communicate value of libraries to community	3.0161	70.2%	29.8%
8) Contribute to problem solving	2.3226	96.8%	3.2%
9) Communicate verbally/in writing	2.0806	99.2%	0.8%

The responses for items 1, 2, 6, 8, and 9 were interesting. Many students (61.3% selecting 4, 5, or 6) indicated that they had little or no familiarity with or understanding of the relevance of the ALA Bill of Rights and Code of Ethics while even more (75% selecting 1, 2, or 3) reported their ability to promote intellectual freedom and freedom of information. Almost 60 % stated that they felt competent (3 = 33.9%) or very strong (2 = 25.8%) about their abilities to understand and apply laws pertaining to libraries (item 6) and 96.8%of those surveyed (1 = 10.5%; 2 = 50.8%; 3 = 35.5%) believed strongly in their ability to contribute to problem solving and finding mutually acceptable solutions (item 8). Almost all of the students (99.2% selecting 1, 2, or 3; only 0.8% selecting 4) reported that they could communicate openly and directly, either verbally or in writing. Likewise, responses for items 3, 4, 5, and 7 were informative. Students (68.5% selecting 1, 2, or 3) claimed knowledge of the history of libraries and the roles libraries play in society. They expressed an understanding of the different types of libraries (87.9% selecting 1, 2, or 3) and felt very strong in their ability to remain open to new ideas and current trends (87.9%; 1 = 6.4%; 2 = 56.5%; 3 = 25%). Approximately 70% acknowledged their ability to communicate the value of libraries to the community by selecting 1, 2, or 3 for item 7.

Category Two: Information Resources

This category elicited responses relating to abilities in collection development and management. The three items addressed the ability to define policies, procedures, and criteria concerning the selection, evaluation, deselection, replacement, conservation, and preservation of library materials. Table 3 reflects the mean scores and cumulative percentages for this category.

Table 3

Scores for Category Two: Information Resources

Knowledge of/Ability in	Mean scores (n=124)	Expert, Strong, Competent % rating 1-3	Weak, Very Weak, No Ability % rating 4-6
10) Recommend policies and procedures for selection	3.4758	51.6%	48.4%
11) Collection development and acquisition process	3.6129	50.0%	50.0%
12) Define criteria for collection development cycle	3.7339	47.6%	52.4%

Students responded similarly to all three items. Slightly over 50% believed they were competent (3 = 30.6%) or better (1 = 1.6%; 2 = 19.4%) with regard to the principles of collection development (item 10) and half (50% selecting 1, 2, or 3) acknowledged ability in collection development and acquisition processes (item 11). Slightly fewer students (47.6% selecting 1, 2, or 3) expressed the ability to define criteria for the entire collection development cycle.

Category Three: Organization of Information

Category Three focused on the general structure and nature of the principles of information organization, systems, software, and bibliographic control standards including the ability to recognize and implement emerging trends. This section was composed of three items and Table 4 summarizes the mean scores and cumulative percentages.

Table 4

Scores for Category Three: Organization of Information

Knowledge of/Ability in	Mean scores (n=124)	Expert, Strong, Competent % rating 1-3	Weak, Very Weak, No Ability % rating 4-6
13) Application of bibliographic control standards	4.2903	23.4%	76.6%
14) Current trends in bibliographic control	3.7661	48.4%	51.6%
15) Structure of information organization principles	3.4919	57.3%	42.7%

Not surprisingly, students (76.6% selecting 4, 5 or 6) acknowledged their weakness with regard to application of national and international bibliographic control standards to organize library materials. Almost half (48.4% selecting 1, 2, or 3) felt they could stay abreast of developing trends affecting bibliographic control and resource management. More (57.3% selecting 1, 2, or 3) recognized their ability to understand the structure and importance of information organization principles and systems.

Category Four: Information Technology

Category Four addressed information technology for libraries. Students were asked to identify their abilities to assess technology trends that affect the library and its users and to advise stakeholders concerning appropriate courses of action for technology. They were also directed to think about their ability to articulate and apply library policies addressing privacy, intellectual freedom, and ethical uses of technology. Finally, students were encouraged to reflect on their ability to analyze community needs for current and future trends in technology. The mean scores and cumulative percentages for the three items in this category are shown in Table 5.

Table 5

Scores for Category Four: Information Technology

Knowledge of/Ability in	Mean scores (n=124)	Expert, Strong, Competent % rating 1-3	Weak, Very Weak, No Ability % rating 4-6
16) Assess technology trends relevant to libraries	3.5565	55.6%	44.4%
17) Articulate and apply technology policies	3.4597	55.6%	44.4%
18) Analyze community needs for technology	3.3468	61.3%	38.7%

Over half of the students surveyed (55.6% selecting 1, 2, or 3) responded positively in their ability to assess technology trends for libraries (item 16), to advise on appropriate courses of action (item 16), and to articulate and apply policies concerning privacy, intellectual freedom, and the ethical use of technology (item 17). Slightly more (61.3%) feel competent (3 = 39.5%) or better (1 = 1.6%; 2 = 20.2%) when it comes to analyzing community needs for current and future technology trends.

Category Five: Reference

Category Five dealt with reference services. The seven items in this section addressed the student's ability to perform an effective reference interview, to understand the information-seeking behavior and needs of users from diverse communities, to demonstrate strong interpersonal communication skills, to recognize opportunities for library instruction, to identify and analyze target audiences for library services, to respond appropriately to diversity and cultural differences of users, and to perform outcome-based evaluations to measure the effectiveness of library programs. Table 6 itemizes the mean scores and cumulative percentages.

Table 6

Scores for Category Five: Reference

Knowledge of/Ability in	Mean scores (n=124)	Expert, Strong, Competent % rating 1-3	Weak, Very Weak, No Ability % rating 4-6
19) Effective reference interviewing skills	3.1613	71.0%	29.0%
20) Address information-seeking behavior/needs of diverse patrons	3.2823	59.7%	40.3%
21) Demonstrate interpersonal communication skills	1.9597	99.2%	0.8%
22) Identify opportunities for instruction	2.5645	87.9%	12.1%
23) Identify, analyze target audiences	3.4274	54.0%	46.0%
24) Respond appropriately to diverse users	2.4758	88.7%	11.3%
25) Perform outcome-based evaluations	3.6532	48.4%	51.6%

Item responses for 21, 22, and 24 showed little room for improvement according to the students. Almost all (99.2% selecting 1, 2, or 3; only 0.8% selecting 4) expressed strong interpersonal communication skills, including active listening (item 21). Most (87.9% selecting 1, 2, or 3) felt they were quite capable in identifying opportunities for instruction to empower users in their own information-seeking abilities (item 22) and in responding appropriately to diversity and cultural differences among patrons (88.7% selecting 1, 2, or 3 for item 24). Fewer students (71% selecting 1, 2, or 3) claimed competencies in reference interviewing skills (item 19) and in addressing the information-seeking behaviors and needs from diverse communities (59.7% selecting 1, 2, or 3 for item 20), drawing some attention to the higher percentage reported for appropriately responding to cultural differences among patrons for item 24. Students reported the least ability in identifying and analyzing target audiences for services (only 54% selecting 1, 2, or 3 for item 23) and in performing outcome-based evaluations to measure the effect of various programs on users (51.6% selecting 4, 5, or 6 for item 25).

Category Six: Research

The two items in Category Six highlighted basic research principles. Students were surveyed on their abilities to acknowledge the fundamentals of quantitative and qualitative research methods and to recognize, interpret, and use research literature. Table 7 lists the mean scores and cumulative percentages for each item.

Table 7

Scores for Category Six: Research

Knowledge of/Ability in	Mean scores (n=124)	Expert, Strong, Competent % rating 1-3	Weak, Very Weak, No Ability % rating 4-6
26) Identify/articulate fundamentals of quantitative and qualitative methods	3.7500	45.2%	54.8%
27) Identify, analyze, and use research literature	2.8387	82.3%	17.7%

Less than half of the students (45.2% selecting 1, 2, or 3) expressed the ability to identify and articulate the fundamentals of quantitative and qualitative research methodology and designs, which is basically in agreement with their reported ability in conducting outcome-based evaluations in Category Five (item 25). However, noticeably more students (82.3%) claimed competency (3= 50.8%) or better (1 = 6.5%; 2 = 25%) for recognizing, analyzing, and using research literature. This particular finding is definitely puzzling given their declared inability to recognize basic research fundamentals.

Category Seven: Lifelong Learning

This category emphasized a commitment to continuing education, stressing the importance of information literacy in libraries. Students responded to three items emphasizing the importance of lifelong professional growth and the need for ongoing information literacy initiatives in libraries. Table 8 shows the mean scores and cumulative percentages for this section.

Table 8

Scores for Category Seven: Lifelong Learning

Knowledge of/Ability in	Mean scores (n=124)	Expert, Strong, Competent % rating 1-3	Weak, Very Weak, No Ability % rating 4-6
28) Importance of lifelong learning/continuing education	2.0323	97.6%	2.4%
29) Scope/importance of information literacy/define goals	3.1371	62.9%	37.1%
30) Understand/apply instructional design principles	3.7016	47.6%	52.4%

Not surprisingly, most students (97.6% selecting 1, 2, or 3) understood the importance of lifelong learning in library work and pursuing personal and professional growth through continuing education. Fewer students (62.9% selecting 1, 2, or 3) reported an understanding of the importance of information literacy and the ability to define

information literacy goals for a library. Slightly more than half (52.4% selecting 4, 5, or 6) acknowledged the inability to apply basic instructional design principles to design training.

Category Eight: Administration

The last category was aimed at determining students' ability for administration and management of libraries. Five items were included in this section and were designed to elicit responses relating to developing and evaluating budgets, to understanding and ensuring compliance of human resource policies and procedures, to developing and applying methods to measure quality of library services, to identifying opportunities to cooperate with other libraries or community organizations, and to fostering an environment based on integrity and high ethical standards. The mean scores and cumulative percentages are itemized in Table 9.

Table 9

Scores for Category Eight: Administration

Knowledge of/Ability in	Mean scores (n=124)	Expert, Strong, Competent % rating 1-3	Weak, Very Weak, No Ability % rating 4-6
31) Develop/evaluate library budgets	4.3468	29.0%	71.0%
32) Understand/ensure compliance to human resource policies and procedures	3.1048	70.2%	29.8%
33) Develop/apply methods to evaluate services	3.7097	46.0%	54.0%
34) Identify opportunities to cooperate with other libraries/community organizations/share resources	3.4677	58.0%	42.0%
35) Ability to foster environment based on integrity and high ethical standards	2.3790	89.5%	10.5%

Students (71% selecting 4, 5, or 6) reported a definite weakness concerning the development and evaluation of library budgets. Students (70.2% selecting 1, 2, or 3) felt better about their abilities to understand and comply with human resource policies and procedures. Less than half (46%) expressed competence (3 = 28.3%) or better (1 = 1.6%; 2 =1 6.1%) in developing and applying methods to measure the quality and value of library services. More than half (58% selecting 1, 2, or 3) believed they could cooperate with other libraries or community organizations to share information resources, and most (89.5% selecting 1, 2, or 3) believed in their ability to foster an environment based on integrity and high ethical standards.

Discussion

Pre-test results for Category One on Foundational Principles appear to indicate unfamiliarity with key ALA documents for libraries. The differences in the response frequency for the first two items suggest that students believe they can promote intellectual freedom and freedom of information but do not necessarily associate it with the Library

Bill of Rights and Code of Ethics. The topics should definitely remain in the curriculum, particularly in the introductory course for the program. It is unclear as to how the students would have gained knowledge about laws pertaining to libraries unless, perhaps, they have experience working in a library. Even so, the knowledge would be somewhat limited to a specific task or practice. Their confidence in problem solving and communicating effectively is admirable but remains to be demonstrated through coursework and real-life situations.

Student responses for Category Two concerning Collection Development of Information Resources could relate to the paraprofessional experiences of the students. Many Master of Science in Library Science students work in various positions in libraries when they are enrolled in the program. This could contribute to their perception that they know something about collection development, especially with regard to carrying out established selection policies and the acquisition process.

Generally, the results for Category Three on the Organization of Information are not surprising. Knowledge and ability in bibliographic control standards would not be expected for new students beginning the program, even though some could have some paraprofessional cataloging experience. Also, understanding the importance of the principles of information organization and of staying abreast of new developments are traits expected of new students entering the field of library and information science.

The expressed knowledge and ability in Category Four on Information Technology suggests that students are capable of assessing technology trends for libraries, developing policies, and analyzing community needs. The authors know from student advising experience, however, that students procrastinate in taking the required technology course, frequently indicating a dread or fear of technology. This initial positive perception might flow from successful experiences as a library user and the belief that they know library technologies.

Apparent inconsistencies are noted in Category Five on Reference. Students indicate competence or very strong ability in interpersonal communication skills, identifying opportunities for instruction, and responding appropriately to diverse users. Lower abilities are expressed, though, for reference interviewing skills, addressing information needs of diverse users, and in identifying target audiences for programming. Students perceive even less ability in performing outcome-based evaluations for library programs. Students believe they possess the basic and beginning skills for reference and instruction and acknowledge the need to develop them further through coursework and applicable experiences.

Additional inconsistencies are seen in Category Six on Research. Student inability to articulate the fundamentals of quantitative and qualitative research is understandable and also matches the weakness identified in Category Five concerning performing outcome-based evaluations of programs. The fact that students indicated competency or better with regard to analyzing and using research is somewhat troubling since it is difficult to comprehend how they can analyze and use it if they cannot express the fundamentals of research methodologies. This point reinforces the need to emphasize basic research design when reviewing relevant article literature in coursework.

Not surprisingly, students acknowledge the importance in lifelong learning as expressed in Category Seven. Students are competent in discerning the importance of information literacy but express less competence when it comes to applying instructional design principles for training. This reinforces the decision to add an instructional strategies course to address how students approach information literacy instruction.

Finally, key results are noted in Category Eight on Administration. Understandably, students report a definite weakness in developing and evaluating library budgets. Weakness was also felt with regard to developing and applying methods to measure the value of library services and programs. This relates to what was indicated in Categories Five and Six concerning the inability to formulate outcome-based program evaluation and to express fundamentals of basic research design. The fact that students strongly perceive their ability to foster an environment

based on integrity and high ethical standards could explain why they report competence in complying with human resource policies and procedures despite the lack of administrative opportunities.

Conclusion

Data analysis of post-test results is warranted to determine any significant changes in student responses. Data are being collected as students pursue their capstone course, the timing of which varies according to their individual schedules. Curriculum indications from the pre-test results support maintaining the content of the introductory course to include topics concerning the Library Bill of Rights, the ALA Code of Ethics, and other relevant material; reinforcing research methodologies and interpreting research literature at every opportunity; continuing with the instructional strategies elective; and maintaining the management course content with regard to budget and human resource policies and procedures. Additional indications support the need to maintain instruction on the interpretation of bibliographic standards for organizing and cataloging information; introducing developing areas for bibliographic standards, such as the Resource Description and Access (RDA) framework; continuing with reference and instruction topics, such as interviewing and program-planning skills; and expanding student knowledge of emerging library technologies through the required technology course.

Use of the *iSkills*™ Assessment offered by the Educational Testing Service (ETS) is also under consideration, especially since off-campus testing is now offered (ETS, 2014). If used as students enter the program, it could provide additional diagnostic data concerning the information literacy and technology skills of new students, thereby giving direction to course review and curriculum development. One avenue for research after the post-test analysis of data is identifying the data for students currently working in a library and comparing it to the overall pre-/post-test analysis. This information could help determine if students are accurate in their perception of abilities, are over-confident in their self-assessment, are incapable of recognizing, or are unwilling to admit their true abilities. Further possible research concerns the administration of the Multi-Subject Learning Survey (MSLS) to librarians in the workplace as an additional mechanism for evaluation of workplace performance and defining areas for professional development.

Nonetheless, the MSLS instrument is significant because it can direct student self-awareness and advisement according to expected learning outcomes, and it can affirm or suggest curriculum content which, in turn, contributes to program improvement. Ultimately, the MSLS solidifies the overall assessment plan for accreditation. Furthermore, it can contribute to the employer's body of knowledge when evaluating workplace performance and planning professional development opportunities for practicing librarians in any library setting.

References

Applegate, R. (2006). Student learning outcomes: Assessment and LIS program presentations. *Journal of Education for Library and Information Science, 47*(4), 324-336. doi:10.2307/40323824

Archambault, L., & Crippen, K. (2009). Examining TPACK among K-12 online distance educators in the United States. *Contemporary Issues in Technology and Teacher Education, 9*(1), 71-88. Retrieved from http://www.citejournal.org/vol9/iss1/general/article2.cfm

Brown, A. H., & Benson, B. (2005). Making sense of the capstone process: Reflections from the front line. *Education, 125*(4), 674-692.

Burke, S. K., & Snead, J. T. (2014). Faculty opinions on the use of master's degree end of program assessments. *Journal of Education for Library and Information Science, 55*(1), 26-39.

Calderon, O. (2013). Direct and indirect measures of learning outcomes in an MSW program: What do we actually measure? *Journal of Social Work Education, 49*(3), 408-419.

Colthart, I., Bagnall, G., Evans, A., Allbutt, H., Haig, A., Illing, J., & McKinstry, B. (2008). The effectiveness of self-assessment on the identification of learner needs, learner activity, and impact on clinical practice: BEME Guide no. 10. *Medical Teacher, 30*(2), 124-145. doi:10.1080/01421590701881699

Department of Library Science. (2010, August). Program presentation [Program Presentation for American Library Association Accreditation]. Clarion University of Pennsylvania, Clarion, PA.

Educational Testing Service (ETS). (2014). *iSkills*™. Retrieved from http://www.ets.org/iskills/about

Gutsche, B., & Hough, B. (Eds.). (2009). *Competency index for the library field*. Dublin, OH: OCLC, Online Computer Library Center. Retrieved from http://www.webjunction.org/documents/webjunction/Competency_Index_for_the_Library_Field.html

Isaac, S., & Michael, W. B. (1995). *Handbook in research and evaluation: A collection of principles, methods, and strategies useful in the planning, design, and evaluation of studies in education and the behavioral sciences* (3rd ed.). San Diego, CA: EdiTS.

Koehler, M. J., & Mishra, P. (2008). Introducing TPCK. In American Association of Colleges for Teacher Education, Committee on Innovation and Technology (Ed.), *Handbook of technological pedagogical content knowledge (TPCK) for educators* (pp. 3-30). New York, NY: Routledge.

Lattuca, L., Terenzini, P. T., & Volkwein, J. F. (2006). *Engineering change: A study of the effect of Ec2000: Executive summary*. Baltimore, MD: ABET. Retrieved from http://www.abet.org/engineering-change/

Pinto, M., Fernandez-Ramos, A., Sanchez, G., & Meneses, G. (2013). Information competence of doctoral students in information science in Spain and Latin America: A self-assessment. *The Journal of Academic Librarianship, 39*(2), 144-154. doi: 10.1016/j.acalib.2012.08.006

Powell, D. C., Saint-Germain, M., & Sundstrom, L. (2014). Using a capstone case study to assess student learning on NASPAA competencies. *Journal of Public Affairs Education, 20*(2), 151-162. Retrieved from http://www.naspaa.org/JPAEMessenger/Article/VOL20-2/03Powell-Saint-Germain-Sundstrom.pdf

Rogers, S. W., & Goktas, R. K. (2010). Exploring engineering graduate student research proficiency with student surveys. *Journal of Engineering Education, 99*(3), 263-278. doi:10.1002/j.2168-9830.2010.tb01061.x

Suskie, L. (2004). *Assessing student learning: A common sense guide.* Bolton, MA: Anker.