A STUDY OF THE COMPETENCIES NEEDED OF ENTRY-LEVEL ACADEMIC

HEALTH SCIENCES LIBRARIANS

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The purpose of this study was to identify the professional and personal competencies that entry-level academic health sciences librarians should possess from the perspectives of academic health sciences library directors, library and information sciences (LIS) educators who specialize in educating health sciences librarians, and individuals who serve as both LIS adjunct faculty and practitioners in the field of health sciences librarianship. The first six research questions focused on the identification of professional and personal competencies, and the last two research questions focused on comparing and contrasting the three perspectives on the professional and personal competencies. The eight research questions were addressed through four rounds of the Delphi method. Three panels of experts, initially composed of 13 academic health sciences library directors, 8 LIS educators, and 8 LIS adjunct faculty adjunct faculty/health sciences librarianship practitioners, participated in the study, and most participants were female, white, in the age range of 45-64, had less than 20 years of experience in their respective careers, and were members of the Medical Library Association. The data collected from the rounds of the Delphi method were analyzed using descriptive statistics, including measures of central tendency, and non-parametric statistics, including the Kruskal-Wallis and Mann-Whitney U tests. Two major conclusions that can be drawn from the findings of the study are: (1) personal competencies are as important as professional competencies and (2) the professional and personal competencies developed by the LIS educators who specialize in health

sciences librarianship education were preferred over the ones developed by the academic health sciences library directors and LIS adjunct faculty/health sciences librarianship practitioners. Experts in the field of health sciences librarianship have created a comprehensive inventory of both professional (knowledge and skill) competencies and personal (self-concept, trait, and motive) competencies that can be used in professional practice as well as educational planning.

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INTRODUCTION

Background

Academic health sciences libraries face a unique situation at this point in time, as the convergence of new technologies, evidence-based medicine, and bioinformatics has created a complex information environment in which academic health sciences librarians must function. In response to the ever-changing nature of the field of health sciences, Braude (1997) likened the development of health sciences librarianship to the process of natural selection. Changing conditions in both health sciences and librarianship created a new "species" of health sciences librarians that could learn the skills necessary to compete in the health sciences library environment.

As Dalrymple (2003) wrote, "Health sciences libraries operate within the environment of healthcare delivery and are therefore affected by the trends and factors that characterize this environment" (p. 525). Dalrymple continued to explain that three external events changed the role of academic health sciences libraries: the Internet, especially free, public access to MEDLINE; the concept of integrated academic information management systems (IAIMS); and the rise of evidence-based medicine (p. 526). Added to these three events are advances in bioinformatics and molecular biology, and as Lyon, Giuse, Williams, Koonce, and Walden (2004) stated, these advances have created "opportunities and challenges for librarians, because maintaining the high level of skills and competencies necessary to teach the access, retrieval, and use of relevant information is becoming more and more complex" (p. 189).

In 2007, the Medical Library Association released its updated educational policy statement, "Competencies for Lifelong Learning and Professional Success," which demonstrates that the profession is concerned with the competencies that are needed for health sciences librarians to be successful in managing the advances in the health sciences. As academic health sciences librarians continue to evolve to compete in the complex health sciences information environment, it is important to create a comprehensive inventory of the competencies needed to survive and adapt.

Statement of the Problem

The scope of health sciences is ever expanding, and entry-level academic health sciences librarians need to have a certain set of competencies to meet the demands of the field. As Baker, Kars, and Petty (2004) wrote, "Medical or health sciences librarianship is a specialized field, and it is incumbent upon those entering this specialty to possess and maintain essential knowledge and skill sets" (p. 323), and Lyon (2003) added to this point by stating that "as medical practice changes, medical librarians must develop matching skills" (p. 68). Other authors, such as Roper and Mayfield (1993) and Watstein (2004), identified that academic health sciences librarians need to have knowledge and skills not expected in previous years of the profession.

Though there is a body of literature on the competencies needed of medical librarians in general, there is no literature that specifically addresses the professional and personal competencies needed of entry-level academic health sciences librarians. There is an urgent need to identify these competencies to meet the demands of the complex academic health sciences information environment. It is imperative to identify the professional and personal competencies needed of the incoming generation of

academic health sciences librarians to ensure that they are prepared to meet the current and future needs of the profession. To bridge the gap in the knowledge, this research investigated the professional and personal competencies that entry-level academic health sciences librarians need from the perspectives of academic health sciences library directors, library and information sciences (LIS) educators who specialize in educating health sciences librarians, and individuals who serve as both LIS adjunct faculty and practitioners in the field of health sciences librarianship.

Theoretical Framework

The aim of this research was to discover the professional and personal competencies needed of entry-level academic health sciences librarians. The iceberg model developed by Spencer and Spencer (1993) serves as the theoretical framework underlying professional and personal competencies for this study. Spencer and Spencer (1993) identified five types of competency characteristics, including motives, traits, self-concept, knowledge, and skill, which are defined later in the next section of this chapter. According to the iceberg model, skill and knowledge competencies are visible like the top of the iceberg above the water; whereas, self-concept, trait, and motive competencies are hidden like the base of the iceberg under the water. Because skill and knowledge competencies are visible and surface-level characteristics, Spencer and Spencer (1993) proposed that they are easier to develop through training. On the other hand, motive and trait competencies are at the base of an individual's personality and are much harder to assess and develop. Self-concept competencies reside in the middle, as they can be modified but with more time and difficulty. The iceberg model, in some respects, was derived from the work of Boyatzis (1982), who discussed three

different levels of competency (motive and trait level; the self-image and social role level; and the skill level) that are parallel to the work of Spencer and Spencer (1993). Using the iceberg model as the theoretical framework, this study elicited the professional competencies (knowledge and skills) and personal competencies (motives, traits, and self-concepts) from the perspectives of academic health sciences library directors, LIS educators who specialize in educating health sciences librarians, and individuals who serve as both LIS adjunct faculty and practitioners in the field of health sciences librarianship.

<div align="center">Definition of Terms</div>

The terms listed below are defined for the purposes of this study, and they are arranged in alphabetical order.

Academic health sciences library directors: individuals who direct the academic health sciences libraries that serve medical schools in the United States and Canada, listed as members of the Association of Academic Health Sciences Libraries.

Entry-level academic health sciences librarians: information professionals with less than one year of professional experience with a master's degree in library and information sciences or a related field who work at libraries that serve medical schools in the United States and Canada.

Knowledge: "information a person has in specific content areas" (Spencer and Spencer, 1993, p. 10).

LIS adjunct faculty/health sciences librarianship practitioners: part-time faculty members at ALA-accredited master's programs in library and information sciences and practitioners who work as academic health sciences librarians in libraries that

serve medical schools in the United States and Canada, listed as members of

the Association of Academic Health Sciences Libraries.

LIS educators who specialize in health sciences librarianship: full-time faculty members

at a library schools with ALA-accredited master's programs in library and

information sciences that specialize in educating health sciences librarians.

Motives: "the things a person consistently thinks about or wants that cause action"

(Spencer and Spencer, 1993, p. 9).

Professional competencies: the knowledge and skills necessary for successful job

performance (Spencer and Spencer, 1993; Fisher, 2001).

Personal competencies: individual motives, traits, and self-concepts necessary for

successful job performance (Spencer and Spencer, 1993; Fisher, 2001).

Self-concept: "a person's attitudes, values, or self image" (Spencer and Spencer, 1993,

p. 10).

Skill: "the ability to perform a certain physical or mental task" (Spencer and Spencer,

1993, p. 11)

Traits: "physical characteristics and consistent responses to situations or information"

(Spencer and Spencer, 1993, p. 10).

Purpose of the Study

The purpose of the study is to identify the professional and personal

competencies that entry-level academic health sciences librarians should possess,

based on the perspectives of academic health sciences library directors, LIS educators

who specialize in educating health sciences librarians, and individuals who serve as

both LIS adjunct faculty and practitioners in the field of health sciences librarianship.

Each group's perspectives on the professional and personal competencies that health sciences librarians should possess for entry-level positions were also compared and contrasted.

Research Questions

The study addressed the following questions:

1. What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of academic health sciences library directors?

2. What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of academic health sciences library directors?

3. What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences educators who specialize in educating health sciences librarians?

4. What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences educators who specialize in educating health sciences librarians?

5. What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?

6. What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?

7. How do the professional competencies needed of entry-level academic health sciences librarians compare and contrast among the three groups:

    a. academic health sciences library directors

    b. library and information sciences educators who specialize in educating health sciences librarians

    c. library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?

8. How do the personal competencies needed of entry-level academic health sciences librarians compare and contrast among the three groups:

    a. academic health sciences library directors

    b. library and information sciences educators who specialize in educating health sciences librarians

    c. library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?

Significance of the Study

The field of health sciences librarianship is at a crossroads due to the impact of new advances in the health sciences, most importantly bioinformatics. Academic health sciences librarians need to find ways to adapt to these advances in order to serve their user populations. It is imperative that there is a better understanding of the professional and personal competencies that academic health sciences librarians need to have in order to keep up with the new advances in the health sciences.

This study addressed professional and personal competencies that entry-level academic health sciences librarians need, and this can impact library and information

sciences education in terms of curriculum development and revision. The inventory of competencies could be used for recruitment and selection, identification of staff training needs, the development of continuing education courses, the writing of job descriptions and interview questions, and the evaluation of employee performance. It could also assist individuals in deciding if they should pursue this career path. The study may also influence the Medical Library Association's educational policy statement. Lastly, this study could be replicated for other specialized areas of librarianship.

Assumptions

Three major assumptions underlie this study: (1) the experts selected to participate are knowledgeable of the professional and personal competencies that entry-level academic health sciences librarians need to have; (2) the experts selected have computers with Internet access to complete the rounds of the Delphi method employed in this study; and (3) the experts will provide truthful answers to the questions posed in the rounds of the Delphi method.

Limitations

The limitation of the study is that it focused on the professional and personal competencies of entry-level academic health sciences librarians. Also, each academic health sciences library has its own needs in terms of the staffing required, and this study only offers basic guidelines.

Summary

This chapter provides background information, the statement of the problem, purpose of the study, definition of terms, research questions, significance of the study,

and the assumptions and limitations of the study. The following chapter presents a

review of the literature relevant to the study.

CHAPTER II

LITERATURE REVIEW

Introduction

This chapter presents a review of the literature relevant to the study and addresses the following areas: health sciences librarianship education, credentialing of health sciences librarians, and recent trends impacting health sciences librarians. Along with these areas, the chapter also includes a review of the literature related to competencies, competency statements in librarianship, competency studies in librarianship and health sciences librarianship, and competency statements and studies in related fields. Although there is a significant amount of literature about competencies for librarianship, more specifically health sciences librarianship, there is no literature that specifically addresses the competencies needed of entry-level academic health sciences librarians.

Health Sciences Librarianship Education

The development of health sciences librarianship education has been well documented over the years in the *Bulletin of the Medical Library Association*, now known as the *Journal of the Medical Library Association*. The National Library of Medicine (NLM) and the Medical Library Association (MLA) have played a major role in the development of health sciences librarianship education. Roper (1979) and Braude (1997) provided an overview of the history of the education of health sciences librarians, and both start with the specialized training at the University of Minnesota in 1923 to 1924. More than ten years later, the first course entirely devoted to medical librarianship was offered at Columbia University in 1939, taught by Thomas J. Fleming,

the Librarian of the College of Physicians and Surgeons of Columbia University, and the course covered medical bibliography and reference (Doe, 1949). Once Fleming retired from teaching the course in 1946, it was taught by Estelle Brodman and had three components: the literature of medicine, administration of a medical library, and medical terminology (Brodman, 1949). In 1943, the first edition of the *Handbook of Medical Library Practice* was published, with Janet Doe as the editor. Three years later, in 1946, MLA voted to establish a committee to consider the adoption of a training program and standards for medical librarianship. Also in the 1940s, two individuals started training programs for medical librarians, Mary Louise Marshall at Tulane's Rudolph Matas – Orleans Parish Medical Society Library and Eileen Cunningham at Vanderbilt University School of Medicine Library (Hanke & Benzer, 1979).

According to Hill (1972), nine courses in medical librarianship were established between 1951 and 1967. In 1957, NLM began their own internship program, and two new internship programs opened in 1961 in combination with NLM, one at Emory University's A.W. Calhoun Medical Library and one at the University of California Biomedical Library in Los Angeles (Darling, 1963).

In the 1960s, there were more developments in the education of health sciences librarians. NLM announced a one-day symposium on the training goals for health sciences librarians in 1965, and in the same year, the Medical Library Assistance Act was passed, which "provided impetus for medical library education by authorizing federal support specifically for the purpose of training librarians to serve the intensely information-dependent health care field" (Hanke & Benzer, 1979, p. 42). In 1967, the School of Librarianship at the University of Washington-Seattle held the Invitational

Conference on Education for Health Sciences Librarianship. At this conference, Rees from Case Western Reserve University presented his model of medical librarianship education, which included the following four areas: basic principles and techniques of librarianship; structure, organization, and management of medical library resources, facilities, and technology; subject content of biomedicine; and environmental setting of medical practice, medical education, and medical research (Hill, 1972, p. 131). As of 1967, 17 out of 42 library schools offered a course in medical librarianship according to Rees, Rothenberg, and Denison (1968).

By the 1970s, health sciences librarianship education had grown significantly. In 1972, MLA named a full-time director of education. By 1978, 47 out of 64 library schools offered seventy courses in medical librarianship, a sharp difference from the figures reported by Rees, Rothenberg, and Denison in 1968, and these courses were primarily taught by practicing librarians and full-time library school faculty (Roper, 1979).

In the early 1980s, Matheson and Cooper (1982) released their report entitled "Academic Information in the Academic Health Sciences Center: Roles for the Library in Information Management." The authors of this report, a result of a Delphi study, discussed the need for academic health sciences centers to invest in the infrastructure to support their informational support systems, such as libraries. According to the authors, technologically advanced library systems can impact the advancement of medicine in America. As a result of the changing nature of the information environment as discussed in the report, Matheson and Cooper (1982) recommended that librarians "upgrade and refresh" their knowledge management skills and concepts (p. 60). They

also suggested that libraries recruit the best and brightest graduates from schools of library and information sciences.

In the late 1980s, Detlefsen and Galvin (1986) provided an overview of health sciences librarianship education in the 1980s, and they stated that 41 out of 54 American Library Association (ALA) -accredited programs offered one or more courses on some aspect of health sciences librarianship. At this time, they also identified ten full-time faculty members with a specialty in medical or health sciences librarianship, implying that many library schools relied on adjunct faculty to teach health sciences librarianship courses.

The state of health sciences librarianship education in the 1990s was covered by Detlefsen (1993), and her discussion was similar to that presented in 1986 with most library schools using adjunct faculty to teach health sciences librarianship courses. In 1995, the National Library of Medicine released their long-range plan entitled *The Education and Training of Health Sciences Librarians*. The report addresses four areas, including evolving roles of the health sciences librarian, professional education programs for health sciences librarians, lifelong learning programs for health sciences librarians, and broadening recruitment into health sciences librarianship, with specific goals and recommendations for each (U.S. Department of Health and Human Services, 1995).

As a follow-up to the Matheson and Cooper (1982) report, Florance (2002) wrote the report entitled *Better Health 2010* as a response to the American Association of Medical College's program *better_health@here.now*, which was "designed to help medical schools and teaching hospitals make optimal use of information technology and

the Internet to improve the health of people and communities" (p. 1). In the report, Florance (2002) described how the demand for librarians would increase, as they were needed to be trusted intermediaries between consumers and their quest to find health information on the Internet.

In 2006, *Charting a Course for the 21st Century*, NLM's long-range plan 2006-2016, was released. One of the recommendations of the document was to "support training programs that prepare librarians to meet emerging needs for specialized information services." (U.S. Department of Health and Human Services, 2006, Plan for 2006-2016 section, Goal 4 section, para.11). According to the Medical Library Association's Health Sciences Librarianship Courses in ALA-Accredited School Programs from August 2010, there were 47 library schools with one or more courses in health sciences librarianship.

Credentialing of Health Sciences Librarians

MLA is one of the oldest library associations in the United States, being founded in 1898 (Braude, 1997; Funk, 1998b), and it is the only organization specifically for health sciences librarians. The founding members of MLA included four physicians and four librarians. As Darling (1973) wrote, MLA "has been talking about education, standards, and certification for most of its life" (p. 375).

According to Funk (1998b), the medical field has always placed emphasis on continuing education, and "health sciences librarians recognized the need for more intensive subject specific training for their specialty than was offered by the graduate library schools" (p. 207). Based on the need for this training, MLA began offering continuing education courses at their annual meetings in the 1950s.

Funk (1998b) outlined the history of credentialing of health sciences librarians, and it can be traced back to 1948 when MLA offered a certification program "…to help health sciences librarians document their continuing education and other professional activities…" (p. 207). In 1949, MLA established the Code for Training and Certification of Medical Librarians, which included three grades:

- Grade I - required library school training with coursework in medical librarianship

- Grade II – meet Grade I requirements and have a 6-month internship in approved medical library

- Grade III – advanced degree or its equivalent in library science (Hill, 1972).

In 1956, there were minor changes to the code, and major revisions came in 1964 and 1976 (Bell, 1996). A completely new code was approved in 1974, but it did not become effective until 1978. Under the new code, all members had to take a competency examination and meet educational requirements, and the examination had three parts: public services, technical services, and administration (Bell, 1996). This code was revised in 1981.

In 1989, the certification program evolved into the Academy of Health Information Professionals, which today has four levels: provisional, member, senior, and distinguished. The provisional level is especially tailored toward entry-level health information professionals with less than five years of professional experience. However, according to Roper (1998), the Academy of Health Information Professionals was different from the previous certification program because it recognized individuals at all levels of their career, not only at the entry level; was based on accomplishments in

publications, honors and awards, education, and service; and was no longer a competency-based examination.

After examining the education and credentialing of health sciences librarians, it is important to see what trends are impacting the competencies needed of health sciences librarians.

Recent Trends Impacting Health Sciences Librarians

Throughout the literature of health sciences librarianship, there are continuous calls for health sciences librarians to update their competencies to keep up with the changing nature of health care. Presently, several trends in the sciences are impacting the field of health sciences librarianship, such as advances in information technology, evidence-based practice, and genomics and bioinformatics, which are therefore impacting the competencies that health sciences librarians need to have. Cleveland (2011) wrote that the "changing paradigms and trends in health care and health information as well as technological advances" needed to be taken into consideration when producing a well-equipped workforce to meet the demands of the health care environment (p. 62).

In her Janet Doe lecture at the Medical Library Association Annual Meeting, Anderson (1989) stated that "projections of what strengths and skills librarians will need are based on three assumptions: continuing advancements in information technology, growing recognition of the importance of information as a resource, and proliferating applications of information science in health-related disciplines" (p. 328). Later in her speech, she also listed the key attributes that librarians will need in the future, which

are: technical literacy, research competency, service orientation, management abilities, leadership qualities, and organizational knowledge.

Like Anderson (1989), Braude (1993) also believed that information technology was impacting the role of health sciences librarians and was concerned about the education of future health sciences librarians. He wrote, "Information technology is transforming the nature of health sciences information and its management, thereby altering the traditional responsibilities of health sciences librarians" (p. 408). In addition, information technology has changed the nature of reference encounters, and Tu (2007) discussed how information professionals are challenged to deliver information services at the point of need through virtual reference services. She conducted a survey to determine the skills and knowledge that information professionals should possess to conduct virtual reference services in the health sciences, and she found that skills in online searching, reference interviews, interpersonal communication, and problem solving were rated highly.

Although the roles of academic health sciences librarians continue to evolve to meet the user needs, the methods to measure these roles have not adapted. Scherrer and Jacobson (2002) argued that academic health sciences librarians need to develop new measures for the new roles they are undertaking, and they proposed three new categories of services to be measured, including consultation, outreach, and Web authoring.

McKibbon and Bayley (2004) discussed the role that librarians can play in evidence-based practice (EBP) and how they need enhanced or new skills to be a part of the EBP process. The skills include: improving and honing search skills; having an

understanding of basic epidemiological principles; learning how to function within a clinical environment, and having team skills (McKibbon and Bayley, 2004, p. 52).

Just as advances in genomics and bioinformatics are transforming medicine, they are also transforming the competencies needed of health sciences librarians. According to Lyon, Giuse, Williams, Koonce, and Walden (2004),

As the need for specialized information in the area of molecular biology and genetics becomes more central for the effectiveness of organizations, it is crucial for libraries to quickly align with those needs by having a clear vision for increasing the skills and competencies of their staff in this subject area. (p. 188)

This belief is echoed again by Lyon (2003) when she wrote that health sciences librarians must prepare to deal with information in the areas of genetics and molecular biology. Following in the same vein, Tennant (2005) discussed her work as a bioinformatics librarian at an academic health sciences library at the University of Florida, and she saw the need for libraries to fill the void in meeting the information needs of researchers in genetics, genomics, and bioinformatics. As more and more health sciences librarians are involved in biomedical research, they "are utilizing their traditional library-based skill sets, including analysis, research, needs assessment, and objective data gathering, in non-traditional ways" (Glenn and Rolland, 2010, p. 29).

Dealing with change can be difficult, and as Lyon (2003) stated, "For information professionals, the problem is exacerbated by the necessity to stay ahead of our clients' needs" and the need to be "the first to understand and utilize new resources, data types, and systems" (p. 68). The recent trends in health sciences librarianship point to the need to determine competencies for entry-level academic health sciences librarians,

and competencies will be discussed in more detail in the following sections of this chapter.

<center>Competencies</center>

Competencies are an important part of any profession, as they can be used for hiring and selection decisions, training and development, performance management, compensation, and more. Over the years, the term *competency* has been defined in several different ways. For the purposes of this study, competencies are looked at from two different perspectives: professional and personal. Professional competencies are the knowledge and skills necessary for successful job performance, and personal competencies are individual traits, motives, and self-concepts necessary for successful job performance (Spencer and Spencer, 1993; Fisher, 2001). This view of competencies is built upon the theoretical framework of Spencer and Spencer's iceberg model, developed in 1993. This model proposed five types of competencies, including motives, traits, self-concept, knowledge, and skill, that form an iceberg. Skill and knowledge competencies are at the top of the iceberg, visible above the surface of the water, and self-concept, traits, and motives are at the base of the iceberg, hidden below the surface of the water.

According to Rothwell and Lindholm (1999), competencies are theoretically based in behavioral psychology. Drawing upon the areas of animal behavior, child development, cognitive psychology, psychoanalytic ego psychology, and the psychology of personality, Robert White (1959) built a conceptual picture of competence, which he defined as "an organism's capacity to interact effectively with its environment" (p. 297). Building upon the work of White, McClelland's (1973) seminal

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article, "Testing for Competence Rather Than for 'Intelligence,'" is seen as the basis of the competency movement in psychology, as he raised issues about using intelligence or aptitude tests to determine future academic or job performance and offered alternatives to these tests that involved a competency-based approach.

McLagan (1980) introduced the concept of competency models for human resources development, which she defined as "decision tools which describe the key capabilities required to perform a job" (p. 23). Competency models, in her opinion, have advantages over job descriptions and skill lists. She also listed eight ways that competency models can be used, including: recruitment and selection; assessment; individual development planning; training curriculum design; individual career planning; coaching, counseling, mentoring, sponsoring; succession planning and high potential identification; and career pathing (McLagan, 1980, p. 23).

Following McLagan's pioneering work on competency models, Boyatzis (1982) "wrote the first empirically-based and fully-researched book on competency model development" (Rothwell and Lindholm, 1999, p. 93). He was the first to describe job competency as an "underlying characteristic" of a person, which results in effective or superior performance on a job. Underlying characteristics could include motives, traits, skills, self-image, and knowledge (Boyatzis, 1982, p. 21). He proposed that a competency model of managers should have two dimensions, a discussion of the types of competencies as well as levels of competencies. Boyatzis described three different levels of competencies, including: the motive and trait level; the self-image and social role level; and the skill level (p. 28).

Spencer and Spencer (1993) advanced and expanded these three levels of competencies in the development of their iceberg model. The iceberg model, like Boyatzis' levels of competencies, includes traits, motives, self-concept (similar to self-image), and skills, but also adds knowledge. Spencer and Spencer's work is very important to competency modeling because it was designed with the practitioner in mind, providing step-by-step instructions on how to create a competency dictionary and develop competency models.

Though most work in competencies and competency modeling focused on the individual, Prahalad and Hamel (1990) took a different approach by looking at the core competency of an organization. According to Prahalad and Hamel, a core competency is the strategic strength of an organization and what makes it competitive. They discussed the role that core competencies play in the competitiveness of a corporation and believe that corporations should build upon a core of shared competencies.

The next sections cover educational guidelines for librarianship, competency statements and studies in librarianship, competency studies in health sciences librarianship, and competencies in selected related fields.

Educational Guidelines for Librarianship

Several professional organizations have developed educational guidelines for master's programs in library and information sciences. The American Library Association (ALA) accredits master's program in library and information sciences, and each master's program has to meet the standards outlined in the *Standards for Accreditation of Master's Programs in Library & Information Studies*, which was updated in 2008. The standards are organized into the following categories: (I) mission, goals,

and objectives; (II) curriculum; (III) faculty; (IV) students; (V) administration and financial support; and (VI) physical resources and facilities.

The American Society for Information Science and Technology (ASIST) approved their educational guidelines in 2001, and the ASIST document lists six general areas that programs in information science would likely include in their curricula. The areas included: (1) foundations of information science; (2) information use and users; (3) methods of inquiry; (4) information processing; (5) information technology; and (6) information service provision.

The American Association of Law Libraries (AALL) (1988) developed guidelines for graduate programs in law librarianship. The guidelines are divided into two parts: general competencies and subject competencies. The areas of general competencies provided are: (1) reference and research services; (2) library management; (3) collection management; and (4) organization and classification (AALL, 1988, para. 4). The subject competencies that should be included in the library school curricula include: (1) the legal system; (2) the legal profession and its terminology; (3) literature of the law; and (4) law and ethics (AALL, 1988, para.11).

Other specialized professional associations, such as the American Association of School Librarians (AASL) (2010) and the Society of American Archivists (SAA) (2011), have also developed educational guidelines. After examining the educational guidelines for librarianship, it is important to see how competencies for librarianship have been studied in the literature.

Competency Statements in Librarianship

Librarianship is a varied field, so it is not surprising that several different competency statements exist. The American Library Association (ALA) drafted core competencies for generalist librarians in July 2005, and the document contained competency statements for the following areas: professional ethics; resource building; knowledge organization; technological knowledge; knowledge dissemination: service; knowledge accumulation: education and lifelong learning; knowledge inquiry: research; and institution management. McKinney (2006) compared ALA's core competencies with the curricula of ALA-accredited programs and found that the core competencies most often fulfilled by the required courses in the curricula are knowledge organization followed by professional ethics. Resource building and knowledge accumulation: education and lifelong learning are least often fulfilled by core courses.

In January 2009, ALA's Council approved and adopted as policy the core competences of librarianship, a listing of competences needed for persons graduating from ALA-accredited master's programs in library and information sciences. The areas of competence included are similar to those found in the draft discussed above, but the wording is different. The competence areas are: foundations of the profession; information resources; organization of recorded knowledge and information; technological knowledge and skills; reference and user services; research; continuing education and lifelong learning; and administration and management.

ALA (2002) also published a listing of competencies for library students and professional librarians in the area of intellectual freedom. The intellectual freedom competencies are divided into two sections: content knowledge and communication

skills for the students and working librarians. Most of the competencies relate to knowledge of the First Amendment of the United States Constitution and legal issues.

Specialized areas of librarianship, such as youth services, reference, business reference, research, instruction, and special collections, have developed their own competency statements. The Association for Library Service to Children (ALSC) (2009), a division of ALA, developed competencies for librarians serving children in public libraries in the following areas: knowledge of client group; administrative and management skills; communication skills; knowledge of materials; user and reference skills; programming skills; advocacy, public relations, and networking skills; professionalism and professional development; and technology. In comparison, the Young Adult Library Services Association (YASLA) (2010), also a division of ALA, has a listing of competencies named *Competencies for Librarians Serving Youth: Young Adults Deserve the Best*. The competencies are divided into seven areas, including: leadership and professionalism; knowledge of client group; communication, marketing and outreach; administration; knowledge of materials; access to information; and services.

Another specialized set of competencies is the *Professional Competencies for Reference and User Services Librarians*, developed by the Reference and User Services Association (RUSA) of ALA in 2003. The competencies are organized under five major headings, including access, knowledge base, marketing/awareness/informing, collaboration; and evaluation and assessment of resources, with each having its own listing of competencies. The access competencies included responsiveness; organization and design of services; and critical thinking and

analysis. The knowledge base competencies included environmental scanning; application of knowledge; dissemination of knowledge; and active learning. The marketing/awareness/informing competencies included assessment; communication and outreach; and evaluation. The collaboration competencies included relationships with users; relationships with colleagues; relationships within the profession; and relationships beyond the library and the profession. Finally, the evaluation and assessment of resources and services competencies included user needs; information services; information resources; service delivery; information interfaces; and information service providers.

Like RUSA, the Education Committee of the Business Reference and Services Section (BRASS) (2006) of ALA developed its own specialized core competencies for business reference guide series. Each of the ten guides focused on a different area of business, including accounting; advertising and marketing; banking; company and industry research; insurance; international business; investment and finance; jobs and human resources; small business; and taxation.

Research librarians also have their own set of competencies. The Association of Southeastern Research Libraries (ASERL)'s *Shaping the Future: ASERL's Competencies for Research Librarians* was adopted in 2000 and included five statements in regards to the competencies of research librarians. In addition, the document stated that the "attributes of a successful research librarian include intellectual curiosity, flexibility, adaptability, persistence, and the ability to be enterprising" (p. 5). The five statements regarding competencies are as follows: (1) "The research librarian develops and manages effective services that meet user needs

and support the research library's mission"; (2) "The research librarian supports cooperation and collaboration to enhance service"; (3) "The research librarian understands the library within the context of higher education (its purpose and goals) and the needs of students, faculty, and researchers"; (4) "The research librarian knows the structure, organization, creation, management, dissemination, use, and preservation of information resources, new and existing, in all formats"; and (5) "The research librarian demonstrates commitment to the values and principles of librarianship" (pp. 5-6).

The Association of College and Research Libraries (ACRL) (2007, 2008) developed standards and guidelines for instruction librarians and coordinators as well as special collections professionals. ACRL's *Standards for Proficiencies for Instruction Librarians and Coordinators* was approved in 2007, and it is divided into twelve categories of proficiencies, including:

1. Administrative skills
2. Assessment and evaluation skills
3. Communication skills
4. Curriculum knowledge
5. Information literacy integration skills
6. Instructional design skills
7. Leadership skills
8. Planning skills
9. Presentation skills
10. Promotion skills
11. Subject expertise
12. Teaching skills (para. 9).

In addition, ACRL (2008) developed *Guidelines: Competencies for Special Collections Professionals*, and the document listed fundamental competencies as well as specialized competencies for individuals working in a special collections environment.

Several state library professional organizations and state libraries have developed their own competencies for librarians. The State Library of Iowa (2003) developed competencies for public library directors and staff. The competencies relate to eight major areas, including foundations, personal/workplace, board relations, management, public services, collection management, technical services, and technology. Like the State Library of Iowa, the Ohio Library Council (2008) formulated core competencies for public librarians in Ohio. Core competencies are provided along with competencies related to specific aspects of public librarianship, such as children's services and outreach services. Each competency listed in the document is defined, has a listing of associated skills and behavior as well as appropriate training units for that competency. The New Jersey Library Association (NJLA) (n.d.) developed several documents related to competencies, including *Competencies for Library Administrators*; *Competencies for Children's Librarians*; *Core Competencies for Librarians*; *Reference and Information Services Competencies*; and *Core Competencies for Technical Services Librarians*. The State Library of North Carolina (2007) and the California Library Association (2005) have created documents that address technological competencies for librarians.

Specialized library professional organizations, such as the Art Libraries Society of North America (ARLIS/NA), Music Library Association, Special Library Association (SLA), American Association of Law Librarians (AALL), and MLA, have developed competency statements for their memberships. ARLIS/NA has a professional competencies document entitled *Core Competencies for Art Information Professionals* updated in 2010. The major areas of core competencies addressed in the document

include: subject knowledge and expertise; reference and information access; instruction; collection management, development and organization; public service; management and supervision; research and assessment; technology; information policy; and professional advocacy.

The Library School Liaison Subcommittee of the Music Library Association prepared a listing of core competencies for music librarians in 2002. The document contained eight broad competency areas, including: professional ethos; training and education; reference and research; collection development; collection organization; library management; information and audio technology systems; and teaching.

SLA's *Competencies for Information Professionals of the 21st Century* from 2003 includes core competencies, professional competencies, and personal competencies. The two core competencies relate to lifelong learning and professional ethics. The professional competencies include: managing information organizations; managing information resources; managing information services; and applying information tools and technologies. The personal competencies listed range from seeing the big picture to being able to balance work, family, and community obligations.

AALL's *Competencies of Law Librarianship*, approved in 2001, includes core competencies and specialized competencies. The core competencies are for all law librarians, and the specialized competencies cover the following areas: library management; reference, research and client services; information technology; collection care and management; and teaching.

MLA developed its own educational policy statement in 1991, called *Platform for Change*, which was based on the survey conducted by Roper and Mayfield (1993) to be

discussed later in this chapter. *Platform for Change* listed the knowledge and skills that

health information skills medical librarians needed to have, and the knowledge and skills

were categorized into seven areas, including: health sciences environment and

information policies; management of information services; health sciences information

services; health sciences resource management; information systems and technology;

instructional support systems; and research, analysis and interpretation (Medical Library

Association [MLA], 1991).

In 2007, MLA released its updated educational policy statement entitled

Competencies for Lifelong Learning and Professional Success, and it includes seven

professional competencies for health sciences librarians that are similar in nature to the

seven areas of knowledge and skills identified in the *Platform for Change*. The seven

competencies of health sciences librarians listed in *Competencies for Lifelong Learning*

and Professional Success included:

1. Understand the health sciences and health care environment and the policies, issues and trends that impact that environment
2. Know and understand the application of leadership, finance, communication, and management theory and techniques
3. Understand the principles and practices related to providing information services to meet users' needs
4. Have the ability to manage health information resources in a broad range of formats
5. Understand and use technology and systems to manage all forms of information
6. Understand curricular design and instruction and have the ability to teach ways to access, organize, and use information
7. Understand scientific research methods and have the ability to critically examine and filter research literature from many related disciplines. (Medical Library Association [MLA], 2007, para. 2)

In addition to these competencies, the *Competencies for Lifelong Learning and*

Professional Success include personal characteristics for success.

There is overlap in the competency statements in librarianship, as the following competencies (knowledge and skills) have been listed in more than one statement: administration and management, client/user needs, collection management, evaluation and assessment, information organization, information resources, leadership, reference, research, subject expertise, teaching/instruction, and technology.

Competency Studies in Librarianship

The library and information sciences literature contains much discussion on the competencies for librarianship. Each of the studies took a different angle when studying competencies, and the discussion of each study is presented in chronological order.

Creth and Harders (1980) surveyed academic research library personnel officers to determine what qualifications they were seeking for entry-level librarians. According to the results of their survey, "Graduate students would be well advised to see that their curriculum includes some basic coursework in the areas of management skills, automation, and research and writing" (p. 2169).

Preschel (1988) discussed the training and characteristics that employers in the information industry want, and they are divided into four categories, including personal traits, undergraduate and graduate subject education, library and information science education, and on-the-job learning and continuing education. She stated that the most important personal traits include "a logical and orderly mind, the ability to learn from experience, and the ability to extrapolate from learned experience" (p. 358). Also, employers frequently request computer and foreign language skills and knowledge of business and science from undergraduate education.

Chandler (1994) researched the professional preparation competences for law librarianship using the Delphi method with a panel of experts in law librarianship and a survey of private law librarians. She found that most of the competencies ranked "of greatest importance" by the experts were specifically related to the subject areas of law, law librarianship, and legal research, and the survey of private law librarians confirmed this finding. Also, the competences of analytical and problem solving, oral and written communications, and interpersonal relations skills were ranked "of greatest importance" by both groups.

From a personal perspective, Bates (1998) listed the skills that she believed every library school graduate needed to have. Her listing of skills included the following: (1) basic librarianship skills; (2) basic proficiency in online services; (3) basic skills using Internet; (4) an understanding of the information environment and when to use which types of information sources; (5) being comfortable wearing different hats; (6) teaching skills; (7) strong people skills; (8) being able to think like an entrepreneur; (9) leadership skills; (10) being able to embrace change; and (10) being able to reinvent yourself (pp. 30-32).

Using a Delphi study, Feret and Marcinek (1999) determined the skills needed of academic librarians in the year 2005. According to their results, an academic librarian's "most important characteristics are very good interpersonal and communication skills, language proficiency, team-working skills, user friendliness, and customer orientation" (p. 101). Also, the academic librarian should have teaching skills, library and information technology skills, as well as managerial and analytical skills. In 2005, Feret and Marcinek replicated their study to verify the results of their previous study and to explore

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further what competencies librarians need to have for the future. The 2005 study

showed that information technology and communication skills remained at the top.

Also, the role of managerial skills, especially fundraising, will grow greatly in the future.

Xu and Chen (1999) analyzed 133 job advertisements for systems librarians in

American Libraries to determine the knowledge, skills, and qualifications that employers

expect of systems librarians. According to their study, the core requirement for systems

librarians was knowledge of library automated systems.

Fisher (2001), looking at what knowledge and skills employers sought of

acquisition librarians, analyzed position announcements for acquisitions-related jobs in

1975, 1987, and 1999. He also compared these to other studies to develop a listing of

core competency areas. The four competency areas are acquisitions competencies,

technology competencies, management competencies, and personal competencies.

Baruchson-Arbib and Bronstein (2002) conducted a Delphi study in Israel to

determine the future of the library and information science profession in regards to the

changes in information technology. One aspect of the study was to determine the skills

needed of library and information professionals to adapt to the changes in information

technology. The experts believed that library and information professionals need to

have outreach and marketing skills and see themselves outside the walls of the library.

Instructional skills were also seen as important for library and information professionals.

Mahmood (2002), in comparison, focused on the competencies of Pakistani

librarians. He surveyed 150 heads of university and postgraduate-level college libraries

to determine the competencies needed of future academic librarians in Pakistan. The

top competencies identified were information technology skills, interpersonal communication, and leadership skills.

Looking at a specific library setting, Holloway (2003) described the development of core and mastery-level competencies for science/engineering librarians at the University of Arizona Library. The core and mastery-level competencies documents addresses has five areas, including collection development and needs assessment; information resource development; education; reference; and personal competencies.

Based on a review of the literature, Fourie (2004) identified the potential roles of librarians, including a cultural role, teaching role, provision of access to information, space provision, negotiation/lobbying, publishing role, advising role, project management, information organization, archival management, and information retrieval and researching.

Sproles and Ratledge (2004) analyzed entry-level librarian ads published *American Libraries* from 1982 to 2002, and they developed a listing of the qualities of an entry-level librarian from their findings. The qualities include an ALA-accredited MLS degree; high level of computer/automation knowledge or experience; significant level of knowledge of or experience in their area of specialization; high degree of communication and interpersonal skills; high degree of diversity awareness and ability to work well with others; and show evidence of scholarly ability (n.p.)

Focusing on Iran, Hayati (2005) surveyed library educators, library managers, and librarians to determine the competencies that professional librarians in that country should have. In the area of general skills, the use of computers and other information technologies; organization of materials; and working in teams ranked the highest. The

study found that there was "no significant difference in attitudes among library educators, library employers, and professional librarians regarding the competencies that professional librarians should possess" (p. 191).

Dole, Hurych, and Liebst (2005) conducted a study to identify if assessment was a core competency required of library leaders, such as directors and upper-level administrators, and they did determine that it was an important competency for library leaders at Carnegie MA I institutions.

Helmick and Swigger (2006) reported on their project to identify competencies for librarians and library practitioners in the western states of the United States. Their project findings showed that the three highest rated competencies were the following: (1) "Create a welcoming, useful, responsive library environment to encourage use and strengthen support of the library by the community"; (2) "Explain such day-to-day library policies as circulation, intralibrary and interlibrary loan processes, reference response and referral, and Internet"; and (3) "Develop and maintain library collections based on the needs of the community served" (p. 63).

Arns and Price (2007) conducted a survey to assess the supervisory skills and managerial competencies valued by new library supervisors. The top three highest ranking competencies included problem solving, planning and goal setting, and oral communication tied with decision making. The top three highest ranking competencies obtained from the master's in library and information sciences coursework preparation included technical competence, written communication, and client/customer service.

Griffiths and King (2008) discussed the future of academic librarians in their presentation given at the American Library Association Annual Meeting in Anaheim,

California. Within their presentation, the authors presented the results of a survey of the competencies needed of academic librarians. From the survey, competencies in the following areas were identified: operations/technical services; user services; management/administration; technology/systems; digital libraries; and general professional librarianship.

Using an emotional intelligence framework, Promís (2008) analyzed job postings published in *College & Research Libraries News* from 2005-2006. She found that the most often mentioned "soft skills" were leadership competencies, collaboration and cooperation, and communication skills; however, overall, most of the job ads were not developed to attract individuals with emotional intelligence skills.

Lester and Van Fleet (2008) and Van Fleet and Lester (2008) looked at the use of competencies statements in curriculum planning in library and information studies education and use in state and public libraries. In regards to using competencies statements in library and information studies education, Lester and Van Fleet (2008) performed a content analysis of the program presentation documents submitted to the American Library Association Committee on Accreditation and surveyed United States and Canadian LIS schools. The authors found that competencies statements are used in LIS schools' curriculum planning and development, but not all LIS schools mentioned competencies statements in their program presentations. Comparing the results of this study with the other study conducted by Van Fleet and Lester (2008) regarding state and public libraries' usage of competencies statements, the authors noted that the respondents from state and public libraries do not extensively use competency statements or think they are absolutely essential.

Using interviews and group discussion, Ammons-Stephens, Cole, Jenkins-Gibbs, Riehle, and Weare (2009) developed a core leadership competency model for the library profession. The model consisted of four over-arching competencies, cognitive ability, vision, interpersonal effectiveness, and managerial effectiveness. An additional category of personal attributes was included in the model in the first iteration, but there was some debate among the group members about whether personal attributes are competencies.

Gonzalez (2010) examined the workforce competencies for urban public librarians through focus groups and found that the critical knowledge, skills, and abilities reported by the focus group members were line with the reference and user services category in the ALA core competencies listing. Also, the focus group members thought that communication skills were important, especially close listening, technical writing, and proficiency in another language.

Like Gonzalez (2010), Partridge, Lee, and Munro (2010) used focus groups to identify the current and anticipated skills and knowledge required for information professionals in the Web 2.0 environment. The major areas of skills and knowledge discussed were technology, learning and education, research or evidence-based practice, communication, collaboration and teamwork, user focus, business savvy, and personal traits.

By analyzing job descriptions from 2000 through 2008, Han and Hswe (2010) identified the required skill set for metadata librarians, which consisted of skills relating to professional work (such as knowledge of metadata standards); skills relating to performance at work (such as analytical skills); and being able to work independently

and in a team environment. Flexibility and the ability and willingness to learn new skills were the most important work performance skills.

Taking a similar approach, Sutton and Davis (2011) analyzed job advertisements on several electronic discussion lists from January 2005 to December 2009 to identify core competencies for electronic resource librarians. Having an ALA-accredited master's degree in library science was the most frequently listed requirement. This requirement was "followed in order by experience with an integrated library system, ability to work collaboratively, familiarity with industry trends, and a customer service orientation" (p. 150).

The general trend in the competency studies in librarianship is that communication and interpersonal skills are very important. In addition, knowledge and skills in the following areas have been mentioned more than once in the studies reviewed: collection management, customer orientation/service, information resources, leadership, management, problem solving/analytical, teamwork/collaboration, teaching/instruction, and technology. After examining the competency studies in general librarianship, it is important to look specifically at the literature related to competencies in health sciences librarianship.

Competency Studies in Health Sciences Librarianship

Many previous studies, which are discussed below, have been undertaken to discover the competencies that health sciences librarians need to have. One way that many researchers have utilized to identify competencies is by looking at the requirements listed in job advertisements, and Schmidt and Swanton started this trend with their 1980 study. In their study, Schmidt and Swanton (1980) analyzed the content

of position advertisements in *MLA News* from 1978 to 1979. Of the positions they examined, 39.6% were entry-level. The most frequently requested experience or training requirement was NLM on-line experience.

As a follow-up to the Schmidt and Swanton study, Stroyan (1987) analyzed 294 job advertisements appearing in *MLA News* in 1986 to determine to what extent employers' found certification necessary or desirable, and it was found that employers requested certification in 25% of the advertisements and required it in 7% of the advertisements. Stroyan also examined the background and training requirements listed in the advertisements, and the most frequently requested was online bibliographic experience or training, which is comparable to Schmidt and Swanton's findings in 1980.

Smith (1997) analyzed position advertisements appearing in *MLA News* in 1991 and 1995 to determine the Internet's impact on the profession. In 1991, she found that only one position advertisement requested Internet skills, compared to thirty-one position advertisements requesting Internet skills in 1995.

Funk (1998a) compared job listings in *MLA News* from the years of 1977-1978, 1986, and 1996 in terms of job titles and new knowledge and skills. Similar to the findings of Smith (1997), Funk (1998a) found that "nearly 44% of the job listings in 1996 required Web, Internet, or information systems knowledge whereas none did in 1986" (p. 381). Funk also determined that the top three knowledge and skills requirements in 1996 were instruction and teaching skills; Web, Internet, or information systems knowledge; and reference skills compared to online searching, knowledge of automated systems, and supervisory skills in 1986.

Surveying health sciences librarians is another method used by researchers to study the competencies needed of these individuals. Qureshi (1990) surveyed health sciences librarians to examine their continuing education and professional development. According to the results of the study, the majority of health sciences librarians learned specialized skills on the job, and they believed the traditional master's degree was not sufficient to prepare health sciences librarians for the health information environment.

Roper and Mayfield (1993) surveyed a sample of the MLA membership "to define the knowledge and skills required for competent professional performance now and in the future and to enable MLA to establish educational policies" (p. 396). MLA's educational policy statement *Platform for Change* was based on the survey conducted by Roper and Mayfield and adopted by the MLA's Board of Directors in December 1991. The two highest ranked knowledge and skills, deemed to be important now and in the future, included oral and written communication and knowledge of health sciences practitioners' needs.

Bowden and Olivier (1995) surveyed members of the Association of Academic Health Sciences Library Directors to determine employers' expectations of entry-level academic health sciences librarians. According to a majority of the employers, the employee skills of problem solving/analytical skills and microcomputer skills were considered "very important." In regards to personal qualities, "more than 79% of the employer respondents indicated that the following qualities were very important considerations in hiring recent graduates: communication skills, enthusiasm, self-esteem, flexibility, service orientation, willingness to be a team player, and interpersonal skills" (p. 238).

Blackwelder and Dimitroff (1996) surveyed health professionals to determine their image of librarians. Within their survey, which was sent to health professionals and health sciences librarians, they asked the participants to list the three most important skills that librarians need to be successful. Communication skills were found to be the most important by both librarians and health professionals. The librarians and health professionals disagreed on the following skills. Librarians ranked interpersonal skills and analytical skills second and third respectively; whereas, health professionals ranked computer/technology skills and subject expertise skills second and third respectively.

A study by Giuse et al. (1997) also examined librarians' skills from the librarian and library user point of views. They researched the knowledge and skill sets for health sciences librarians from the perspectives of librarians and library users through focus groups, email consultation, taxonomy creation, and a formal survey conducted through email and the Web. From their study, the researchers found that librarians most favored personal characteristics; whereas, library users ranked general librarianship skills highly.

Watson (2005) conducted an online survey of Canadian academic health sciences librarians to determine if they found that subject knowledge was important for doing their jobs. According to the findings, more than 90% of the respondents indicated that subject knowledge was "very important" or "somewhat important," but not many respondents believed that having a degree in the health sciences was necessary (p. 459). In order to obtain and maintain subject knowledge, continuing education is the method most often used by Canadian academic health sciences librarians.

Banks, Cogdill, Selden, and Cahn (2005) compared public health and health sciences librarianship competencies to find areas of intersection.   They found several areas of intersection between public health and health sciences librarianship competencies, including areas of analytical skills, policy development, communication skills, community dimensions of practice, basic public health sciences, financial planning and management, and leadership and systems thinking. For each area of public health competency, the authors paired it to the MLA's essential areas of knowledge and discussed potential partnerships between public health and health sciences librarianship.

Petrinic and Urquhart (2007) interviewed 16 librarians in the United Kingdom to determine the educational and training needs of health librarians. The authors found that teaching skills, advanced search skills, project management skills, research methods and statistics were competencies that librarians should possess to work in the health sciences.

Rankin, Grefsheim, and Canto (2008) conducted a systematic review of the literature on informationists. Within the review, the authors discussed competencies for an informationist and provide a model of the competencies adapted from Giuse, Sathe, and Jerome (2006). The competencies are organized into the categories of personal, functional, and knowledge. The competencies listed under personal include communication, professionalism, lifelong learning, quality assurance, proactivity, leadership, customer service, and entrepreneurialism. The competencies listed under functional include locating information, critical appraisal, information synthesis, information management and organization, project management, education, research,

applied informatics, and current awareness. The competencies listed under knowledge include domain, information environment, research design and analysis, technology, organizational, related disciplines, and health policy and regulations.

Taking a look at reference librarians, Wu and Li (2008) analyzed job announcements advertised in *MLA News* to see what qualifications and duties employers desired for reference positions. The authors looked at 247 job announcements for reference positions, and 60% of the positions were entry-level.   The top five responsibilities requested in the job announcements were reference assistance, teaching or instruction, outreach activities, technology, and leadership and management.

Like the competency studies in librarianship, the competency studies in health sciences librarianship pointed to the need for communication and interpersonal skills. In addition, the knowledge and skills mentioned more than once in the health sciences librarianship studies are very similar to those mentioned in the librarianship studies. The knowledge and skills mentioned are: leadership, management, problem solving/analytical, project management, research, searching, subject expertise, teaching/instruction, and technology. Despite the many studies conducted in the area of competencies needed of health sciences librarianship, still the question remains – what competencies should entry-level academic health sciences librarians possess?

Competency Statements in Selected Related Fields

It is important to examine the competency statements in related professions, such as medicine and public health, to health sciences librarianship because health sciences librarians will be serving individuals in these professions. Knowing the

competencies needed of health practitioners may influence the competencies that health sciences librarians should possess to meet the information needs of these individuals.

The Association of American Medical Colleges (AAMC) released a report in 1998 identifying the learning objectives for medical student education. Within the document different adjectives are used to describe physicians, including altruistic, knowledgeable, skillful, and dutiful, and the learning objectives match these adjectives. The most relevant objective to academic health sciences librarians listed in the document is "the ability to retrieve (from electronic databases and other resources), manage, and utilize biomedical information for solving problems and making decisions that are relevant to the care of individuals and populations" (American Association of Medical Colleges [AAMC], 1998, p. 9).

In addition, the Accreditation Council for Graduate Medical Education (ACGME) accredits post-MD medical training programs, and they developed an Outcome Project to place more emphasis on educational outcomes. As part of this project, ACGME (1999) identified competencies in six general areas for residents, including patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice. The area of practice-based learning and improvement specifies that residents need to appraise and assimilate scientific evidence, which is relevant to academic health sciences librarians.

Public health professionals are also concerned about competencies, and the Council on Linkages Between Academia and Public Health Practice released their core competencies for public health professionals in April 2001. Currently, the Council is

working on updating the competencies based on changes to the profession due to September 11, 2001, and advances in information technology. The core competencies cover eight areas: (1) analytic/assessment skills; (2) policy development/program planning skills; (3) communication skills; (4) cultural competency skills; (5) community dimensions of practice skills; (6) basic public health sciences skills; (7) financial planning and management skills; and (8) leadership and systems thinking skills (Council on Linkages Between Academia and Public Health Practice, 2001). Public health professionals are expected to know how to access appropriate data and information sources as well as manage information systems, which is very relevant to academic health sciences librarians.

In 2003, the Institute of Medicine released *Health Professions Education: A Bridge to Quality*, which specifies the five core competencies that all health professionals should possess. The "core competencies that all health clinicians should possess, regardless of their discipline, to meet the needs of the 21st century health care system" are: (1) provide patient-centered care; (2) work in interdisciplinary teams; (3) employ evidence-based practice; (4) apply quality improvement; and (5) utilize informatics (Institute of Medicine, 2003, pp. 45-46). Without a doubt, academic health sciences librarians should possess skills in evidence-based practice and informatics to assist clinicians in meeting their needs.

The National Commission on Certification of Physician Assistants (NCCPA) identifies the competencies needed of physician assistants in their document from 2005. The competencies include medical knowledge, interpersonal and communication skills, patient care, professionalism, practice-based learning and improvement, and systems-

based practice. The competency of practice-based learning is of most importance to health sciences librarians since the physician assistants are expected to "engage in critical analysis of their own practice experience, medical literature and other information resources for the purpose of self-improvement" (National Commission on Certification of Physician Assistants [NCCPA], 2005, p. 4).

Huang (2007) identifies the competencies needed in health, medical, and biomedical informatics based on his study of the literature and current graduate curricula in the fields. The most frequent competencies taught were research skills, knowledge in health information systems, and methods for informatics/computer sciences. The study also indicated that "knowledge or skills in interpersonal communications, social impact of IT [information technology] on health, and data mining may represent important skills for future informaticians" (p. 89).

Based on the literature of competencies in related professional areas to health sciences librarianship, academic health sciences librarians should be able to assist health care professionals in managing, accessing, and evaluating health information. In addition, academic health sciences librarians should have an understanding of informatics and evidence-based practice.

Summary

This chapter presented a review of the literature related to the study in the areas of health sciences librarianship education, credentialing of health sciences librarians, and recent trends impacting health sciences librarians as well as literature related to competencies, competency statements in librarianship, competency studies in librarianship and health sciences librarianship, and competency statements and studies

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in selected related fields. Academic health sciences librarians operate within a complex

health information environment impacted recently by evidence-based practice,

bioinformatics, and technology. Competency statements in librarianship and

competency studies in librarianship, health sciences librarianship, and related health

fields point to the need for an entry-level academic health sciences librarian to have

knowledge and skills in the following 21 areas (in alphabetical order): (1) administration

and management, (2) client/user needs, (3) communication, (4) collection management,

(5) customer orientation/service, (6) evaluation and assessment, (7) evidence-based

medicine, (8) informatics, (9) information organization; (10) information sources, (11)

interpersonal relations, (12) leadership, (13) problem solving/analytical, (14) project

management, (15) reference, (16) research, (17) searching, (18) subject expertise, (19)

teaching/instruction, (20) teamwork/collaboration, and (21) technology.   The next

chapter provides the methodology used in the study.

CHAPTER III

METHODOLOGY

Introduction

This chapter presents the methods and procedures used in the study. The research design, including selection of experts and data collection and analysis of each round of the Delphi method, are described in detail.

Restatement of Research Questions

The study addressed the following questions:

1. What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of academic health sciences library directors?

2. What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of academic health sciences library directors?

3. What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences educators that specialize in educating health sciences librarians?

4. What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences educators that specialize in educating health sciences librarians?

5. What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of library and information

sciences adjunct faculty/practitioners in the area of health sciences librarianship?

6. What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?

7. How do the professional competencies needed of entry-level academic health sciences librarians compare and contrast among the three groups:

    a. academic health sciences library directors

    b. library and information sciences educators who specialize in educating health sciences librarians

    c. library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?

8. How do the personal competencies needed of entry-level academic health sciences librarians compare and contrast among the three groups:

    a. academic health sciences library directors

    b. library and information sciences educators who specialize in educating health sciences librarians

    c. library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?

Theoretical Framework

The study was based on the theoretical framework of the iceberg model developed by Spencer and Spencer (1993), who identified five types of competency characteristics, including motives, traits, self-concept, knowledge, and skill, which were

defined in Chapter I. According to the iceberg model, skill and knowledge competencies are visible like the top of the iceberg above the water; whereas, self-concept, trait, and motive competencies are hidden like the base of the iceberg under the water. Using the iceberg model as the theoretical framework, this study, employing the Delphi method, elicited the preferred professional competencies (knowledge and skills) and personal competencies (motives, traits, and self-concepts) from the perspectives of academic health sciences library directors, library and information sciences (LIS) educators who specialize in educating health sciences librarians, and individuals who serve as both LIS adjunct faculty and practitioners in the field of health sciences librarianship.

Research Design

For the purposes of this study, the Delphi method was used to determine the preferred professional and personal competencies that entry-level academic health sciences librarians should possess. Three panels of experts participated in the study, and each panel completed three rounds of the Delphi method individually. All three panels completed the same questionnaire for the fourth and final round. Throughout the study, the panel members were not aware of other members of the panel in which they were participating, and they did not know that there were three panels of experts completing the process at the same time. The panel members independently completed the questionnaires for each round electronically using the online survey software, SurveyMonkey®. The data collected from the rounds of the Delphi method were analyzed using descriptive statistics, including measures of central tendency, and non-parametric statistics, including the Kruskal-Wallis and Mann-Whitney U tests.

Delphi Method

      The Delphi method was developed in the early 1950s by the RAND Corporation, and its "purpose is to elicit perceptions or judgments held by experts who are knowledgeable in a specialized area" that eventually give way to a consensus on a particular subject (Vásquez-Ramos, Leahy, & Hernández, 2007, p. 112). The Delphi method "uses a series of data collection 'rounds' to capture and structure the knowledge and opinions of a 'panel' of participants on a topic with which they are perceived to have expertise" (Keeney, Hasson, & McKenna, 2006, p. 206). Unlike a single survey, which provides the respondents' views and opinions on an issue, the Delphi method also provides consensus among the respondents (Keeney, Hasson, & McKenna, 2006).

      According to Rowe and Wright (1999), there are four key features of the Delphi method: anonymity, iteration, controlled feedback, and the statistical aggregation of group response, and each of these features is evident in this study. More specifically, in this study, anonymity occurred through the use of questionnaires rather than face-to-face interaction. The questionnaires maintained the privacy of the experts and prevented them from being impacted by external influence or dominant experts. The study consisted of several iterations of questionnaires, and the process of iteration allowed experts to change their view on the topic without the other experts knowing. After the second round or iteration of the questionnaires, the experts received controlled feedback (a simple statistical summary) about each other's opinions within their panel. Finally, in terms of statistical aggregation of group response, the experts' opinion was represented by the aggregate of individual positions on the topic using the statistical

measure of the median. This statistical aggregation represented the opinion of the panel, not just the most vocal individuals within the panel.

The statistical measure used to aggregate the individual positions on the professional and personal competencies on Likert scales used in Rounds 2 and 3 in this study was the median, which is the exact middle point of a frequency distribution. The median was chosen instead of the mean, an arithmetic average, "because the median response is less likely to be affected by biased responses" (Hallowell & Gambatese, 2010, p. 106), and according to Hsu and Sanford (2007), the use of the median score for Likert-type scales is strongly favored in the literature. The interquartile range (IQR), the difference between the upper and lower quartiles, is a measure of variability designed to be resistant to the effect of extreme data points (Vaughan, 2001), and it was used to determine the level of consensus among the panel members. For the purposes of this study, consensus was defined as being achieved when an IQR of 1 or less was reached.

Reliability and Validity

Reliability "is concerned with obtaining consistent, stable research results with replication" and validity "refers to the extent to which a research instrument measures what it is designed to measure" (Williamson, 2002, p. 334). Cronbach's alpha reliability coefficients were used to measure the internal consistency of the professional and personal competency items in the Round 2 and Round 3 questionnaires, and there was a high level of reliability, which is discussed in more detail in Chapter IV. The experts involved in this study generated the majority of the content of the questionnaires, which demonstrates the validity of the study. According to Goodman (1987), content validity

can be assumed if the participants in the study can be shown to be representative of the area of knowledge being studied.

Selection of Experts

The Delphi method relies on the experts to provide judgment about the topic being addressed in the study, so the selection of experts is very important.   Two key aspects that need to be considered when assembling an expert panel include panel size and expert qualification (Rajendran, 2007). Panel size in Delphi studies has varied widely, as Rowe and Wright (1999) reported ranges in peer-reviewed studies from a low of three members to a high of 98 members. In additional, the number of panels ranged from one to four panels with most studies only containing one panel. Also, Powell (2003) noted that expert panels do not need to be representative samples for statistical purposes, as representativeness is based on the qualities of the expert panel rather than its size. In terms of expert qualification, there is no agreed upon standard for determining if a professional is an expert in his/her field. This study has used a combination of professional work and teaching experience, authorship, and professional leadership positions as criteria to determine the expert qualification.

The three panels of experts in this study consisted of: (1) academic health sciences library directors; (2) library and information sciences (LIS) educators who specialize in educating health sciences librarians; and (3) LIS adjunct faculty/practitioners in the area of health sciences librarianship. The panel size and criteria for selection for each group is discussed in the following sections.

Selection of Academic Health Sciences Library Directors

Academic health sciences library directors are individuals who direct the academic health sciences libraries that serve medical schools in the United States and Canada. The Association of Academic Health Sciences Libraries membership directory was used to identify academic health sciences library directors (Association of Academic Health Sciences Libraries, n.d.). In February 2010, there were 151 directors listed in the directory.

The criteria for the selection of academic health sciences library directors included that the participant: (1) must direct a library that is a member of the Association of Academic Health Sciences Libraries; (2) be a Distinguished Member of the Academy of Health Information Professionals (AHIP) of the Medical Library Association; and (3) have served as a member of the Board of Directors of the Medical Library Association. These selection criteria for the academic health sciences library directors were chosen because they demonstrate their expertise in the field of academic health sciences librarianship. The Academy of Health Informational Professionals is a "professional development and career recognition program" of the Medical Library Association, and distinguished member is the highest level of academy membership (MLA, 2008, para.1). A distinguished member of the Academy of Health Information Professionals has achieved a high level of academic preparation, professional experience, and professional accomplishments. Members of the Medical Library Association's Board of Directors have been elected by the membership and are considered leaders of the association.

Using the above criteria, 22 academic health sciences library directors were selected to be invited to participate in the study. One director was excluded based on her service on the dissertation committee. A total of 13 academic health sciences library directors agreed to participate in the study.

Selection of LIS Educators Specializing in Educating Health Sciences Librarians

LIS educators who specialize in health sciences librarianship are full-time faculty members at a library schools with ALA-accredited master's programs in library and information sciences that specialize in educating health sciences librarians. LIS educators were selected by visiting the Web sites of ALA-accredited library schools to identify faculty members who specialized in educating health sciences librarians. The information obtained from the Web sites was verified using the Association of Library and Information Sciences Education's (ALISE) "Directory of LIS Programs and Faculty in the United States and Canada" and the MLA's listing of health sciences librarianship courses and verified by looking at the library school's Web site. As of February 2010, there were 29 LIS educators who specialize in educating health sciences librarians.

The criteria for the selection of LIS educators specializing in educating health sciences librarians included that the participants: (1) must be a full-time faculty member specializing in the education of health sciences librarians at a library school with an ALA-accredited master's program and have taught for at least three years; (2) have at least written or collaborated on three publications indexed by PubMed[®] and/or Wilson Library Literature & Information Science Full Text; and (3) served in a leadership role in one of the following professional organizations, which are the preeminent organizations for health sciences librarianship and library and information sciences: Medical Library

Association; Association for Library and Information Science Education (ALISE); or American Society for Information Science and Technology (ASIST). These selection criteria were chosen because they indicate that the LIS educator has experience, knowledge, and leadership in the profession. Using the above criteria, 14 LIS educators were selected to be invited to participate in the study. One LIS educator was excluded based on her service on the dissertation committee. A total of 8 LIS educators agreed to participate in the study.

Selection of LIS Adjunct Faculty/Health Sciences Librarianship Practitioners

LIS adjunct faculty/health sciences librarianship practitioners are part-time faculty members at ALA-accredited master's programs in library and information sciences and work as academic health sciences librarians in libraries that are members of the Association of Academic Health Sciences Libraries. LIS adjunct faculty/practitioners were identified through MLA's listing of health sciences librarianship courses and verified by reviewing the library school's Web site and ALISE's "Directory of LIS Programs and Faculty in the United States and Canada." Additional adjunct faculty/practitioners were identified through review of the Web sites of the ALA-accredited library schools as well. As of February 2010, there were 13 LIS adjunct faculty/practitioners.

The criteria for the selection of LIS adjunct faculty/health sciences librarianship practitioners included that participants: (1) must be an adjunct faculty member at a library school with an ALA-accredited master's program teaching a course related to health sciences librarianship; (2) have taught in the area of health sciences librarianship for a school of library and information sciences at least three times; (3) work in a

supervisory position within an academic health sciences library that is a member of the Association of Academic Health Sciences Libraries; and (4) have at least written or collaborated on two publications indexed by PubMed® and/or Wilson Library Literature & Information Science Full Text. These criteria were chosen because they indicate that the LIS adjunct faculty/health sciences practitioners have experience in teaching and working in health sciences libraries as well as knowledge of the profession through their publication record. Using the above criteria, 10 LIS adjunct faculty/health sciences librarianship practitioners were selected to be invited to participate in the study, and a total of 8 agreed to participate.

Institutional Review Board

Following University of North Texas guidelines for research, appropriate documentation was submitted to the Institutional Review Board (IRB), and approval was given to conduct the study (see Appendix A). Modification requests were submitted to and approved by the IRB for each round of the Delphi study. An extension to conduct the study was requested and approved by the IRB.

Pilot Test

A pilot test of all four rounds of the Delphi study was conducted and included six participants composed of two academic health sciences library directors, two LIS educators, and two LIS adjunct faculty/health sciences librarianship practitioners. The pilot study helped to clarify the questions asked on each round's questionnaire, and the questionnaires were modified based on feedback received during the pilot test.

Four rounds of the Delphi method were completed during the study, and each of

the questionnaires was administered using SurveyMonkey®, online survey software.

Each panelist was assigned a unique identifying number to track his/her participation

throughout all four rounds of the study. Figure 1 provides an overview of the four-round
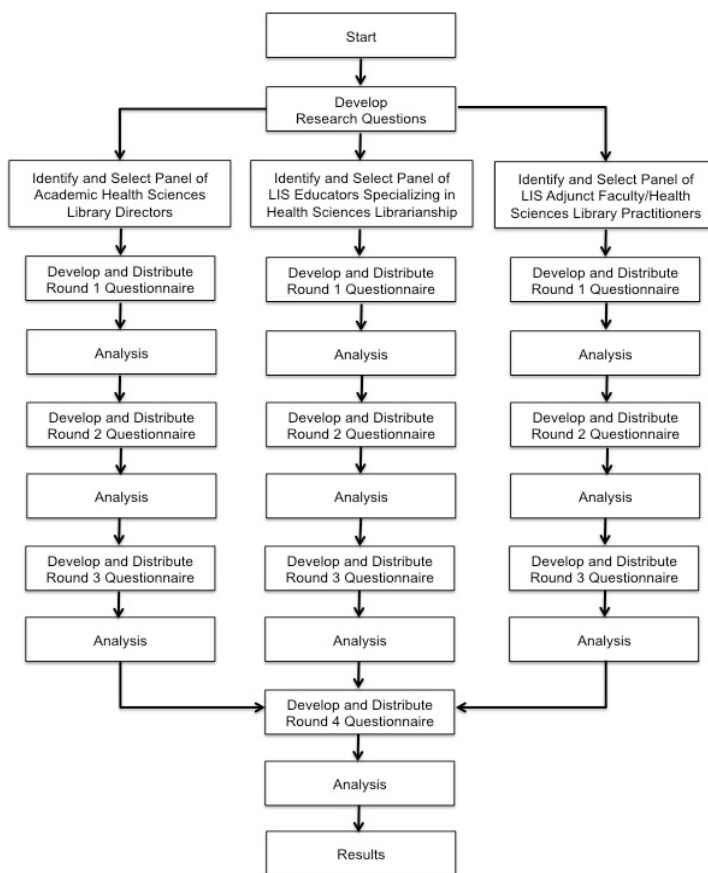
Figure 1. Flow of the four-round Delphi method used in this study.

process of the study. The data collection and analysis procedures for each round are discussed in the subsequent sections.

Round 1 Questionnaire

On February 1, 2010, an electronic mail message was sent to the selected individuals inviting them to participate in the Delphi study and to complete the first round questionnaire (see Appendix B). Thirteen out of 22 (59%) academic health sciences library directors, 8 out of 14 (57%) LIS educators, and 8 out of 10 (80%) LIS adjunct faculty/health sciences librarianship practitioners agreed to participate in the study and completed the first round questionnaire.

Typically, the first round questionnaire in a Delphi study is qualitative (Keeney, Hasson, and McKenna, 2006), and the questionnaire for this study was designed to be open-ended so as not to introduce bias into the research. The Round 1 questionnaire was composed of two parts. Part I included questions that asked the participants to list at least ten professional competencies and ten personal competencies needed of entry-level academic health sciences librarians. Part II included demographic questions about gender, age, race/ethnicity, professional association membership, previous professional library experience, education, job titles, and teaching experience (see Appendix C for the directors' questionnaire, Appendix D for the educators' questionnaire, and Appendix E for the adjunct faculty/practitioners' questionnaire).

The professional and personal competencies obtained from the three panels of experts were entered into spreadsheet software creating three spreadsheets, one for each panel of experts. Two individuals and I reviewed each panel's listing of professional and personal competencies to identify unique responses. Professional and

personal competencies were color-coded to identify similar concepts, and competencies

containing more than one concept were separated into more than one competency (i.e.

"interpersonal communication and political skills" was divided into "Excellent

interpersonal skills" and "Political skills"). In addition, the wording of some competencies

was slightly modified to provide clarity (i.e. "medical terminology" was changed to

"Knowledge of medical terminology"). This process resulted in final listings of

professional and personal competencies for each panel of experts.

Round 2 Questionnaire

For the second round, the three panels of experts were contacted by email and

invited to complete the Round 2 questionnaires on April 8, 2010, and the deadline given

for completion was April 19, 2010 (see Appendix F for email message, Appendix G for

the directors' questionnaire, Appendix H for the educators' questionnaire, and Appendix

I for the adjunct faculty/practitioners' questionnaires). After sending reminder messages,

2 of the 13 directors did not continue in the study, leaving 11 directors (85%)

participating in the study. Eight (100%) LIS educators and eight (100%) LIS adjunct

faculty/health sciences librarianship practitioners completed the Round 2

questionnaires.

The questionnaire for each panel of experts asked them to rate the professional

and personal competencies their panel identified in the first round on a scale from 5 to 1

where 5 is *critically important*, 4 is *very important*, 3 is *important*, 2 is *not very important*,

and 1 is *not important*. The professional and personal competencies were presented to

each expert in random order generated by SurveyMonkey[®]. Randomization, as

discussed by Hallowell and Gambatese (2011), is a way to help reduce judgment-based

bias of experts in studies utilizing the Delphi method. Median ratings and interquartile ranges for each professional and personal competency listed by each of the three panels of experts were calculated and entered into spreadsheet software.

Round 3 Questionnaire

For the third round, the three panels of experts were contacted by email and invited to complete the Round 3 questionnaires on June 24, 2010, and the deadline given for completion was July 1, 2010. The email message sent to the panels of experts was similar to the one sent for Round 2 (see Appendix F for the Round 2 email message). After sending reminder messages, all of the panelists who completed the Round 2 questionnaires continued in the study; therefore, 11 out of the original 13 (85%) academic health sciences library directors, 8 (100%) LIS educators, and 8 (100%) LIS adjunct faculty/health sciences library practitioners completed the Round 3 questionnaires (see Appendix J for the directors' questionnaire, Appendix K for the educators' questionnaire, and Appendix L for the adjunct faculty/practitioners' questionnaires).

In the third round, the three panels of experts were given the median rating for each professional and personal competency from the second round and then asked to re-rate the competencies on the same scale used in Round 2. The professional and personal competencies were presented to each expert in random order generated by SurveyMonkey®. Median ratings and interquartile ranges for each professional and personal competency listed by each of the three panels of experts were calculated and entered into the Excel spreadsheets mentioned previously.

Round 4 Questionnaire

For the fourth round, the three panels of experts were contacted by email and invited to complete the Round 4 questionnaire on September 7, 2010, and the deadline given for completion was September 17, 2010. The email message sent to the panels of experts is similar to the one sent in Round 2 (see Appendix F for the email message). After sending reminder messages, 11 out of the original 13 (85%) academic health sciences library directors and 8 (100%) LIS adjunct faculty/health sciences librarianship practitioners completed the Round 4 questionnaire. However, one of the LIS educators did not continue in the study, which means 7 out of the original 8 (87.5%) LIS educators completed the Round 4 questionnaire (see Appendix M for the questionnaire).

Members of the three panels of experts completed the same fourth round questionnaire to select the listing of professional competencies and the listing of personal competencies that were the preferred ones of the three developed by each panel. After reviewing the median ratings and interquartile ranges for each professional and personal competency collected from the third round questionnaires, competencies with a median score of 2 - *somewhat important* or below and/or interquartile range greater than 1 were eliminated to form the final listings of professional and personal competencies developed by each panel of experts. The results of the fourth round questionnaire were analyzed using simple descriptive statistics.

After the completion of the fourth round of the study, the data were analyzed using non-parametric statistics, including the Kruskal-Wallis and Mann-Whitney *U* tests, to compare and contrast the three panels of experts' perspectives on the professional and personal competencies needed of entry-level academic health sciences librarians.

Summary

This chapter provided an overview of the research design for the Delphi study of the professional and personal competencies of entry-level academic health sciences librarians, and the next chapter contains the results of the study.

CHAPTER IV

RESULTS

Introduction

This chapter presents the results of the study, which collected data from the three panels of experts through four rounds of the Delphi method. The chapter contains a description of the data collected from each round and relates the results of the study to the research questions.

The purpose of the study was to identify the professional and personal competencies needed of entry-level academic health sciences librarians as determined from the perspectives of academic health sciences library directors, library and information sciences (LIS) educators who specialize in educating health sciences librarians, and LIS adjunct faculty/health sciences librarianship practitioners. To accomplish this, the following research questions were developed:

1. What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of academic health sciences library directors?

2. What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of academic health sciences library directors?

3. What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences educators who specialize in educating health sciences librarians?

4. What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences educators who specialize in educating health sciences librarians?

5. What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?

6. What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?

7. How do the professional competencies needed of entry-level academic health sciences librarians compare and contrast among the three groups:

    a. academic health sciences library directors

    b. library and information sciences educators who specialize in educating health sciences librarians

    c. library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?

8. How do the personal competencies needed of entry-level academic health sciences librarians compare and contrast among the three groups:

    a. academic health sciences library directors

    b. library and information sciences educators who specialize in educating health sciences librarians

    c. library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?

To generate the responses to these research questions, the Delphi method, consisting of four rounds with three panels of experts, was used.

Round 1

The first round questionnaires for each panel of experts were composed of two parts. Part I included questions that asked the participants to list at least ten professional competencies and ten personal competencies needed of entry-level academic health sciences librarians. Part II included demographic questions about gender, age, race/ethnicity, professional association membership, previous professional library experience, educational background, job titles, and teaching experience. The results from each panel of experts' questionnaires are reported in the subsequent sections.

Academic Health Sciences Library Directors

In Part I of the questionnaire, the academic health sciences library directors listed 131 professional competencies and 137 personal competencies. These competencies were analyzed and condensed to 88 professional competencies and 94 personal competencies after removing duplicate or similar items. The competencies were also modified for clarity of thought when needed; however, in most cases, the language used by the panelists was kept intact. For example, one panelist listed "organization skill," and it was modified to "organizational skill." The frequencies of the 21 professional competencies that were repeatedly listed by the academic health sciences library directors are included in Table 1.

Table 1

Frequency of Professional Competencies Repeatedly Listed by Academic Health Sciences Library Directors in Round 1

Professional Competency	Frequency
Written, oral, and web-based communication skills	11
Ability to effectively teach library users	6
Knowledge of and use of current, new, and emerging technologies having an impact on services/resources	5
Project management skills	5
Ability to conduct research in librarianship	4
Ability to meet the information needs of users	3
Excellent interpersonal skills	3
Knowledge of cataloging and metadata	3
Knowledge of issues and trends in health sciences environment	3
Oral presentation skills	3
Reference interview skills	3
Strong technical/computer skills	3
Flexibility	2
Health sciences subject knowledge	2
Knowledge of database searching basics	2
Knowledge of database structure	2
Knowledge of health sciences information resources and services	2
Knowledge of the 5-step process for evidence-based librarianship	2
Networking skills	2
Understanding of basic management and leadership principles	2
Understanding of user information behaviors	2

As seen in Table 1, the academic health sciences library directors listed communication and instructional skills most frequently, and the frequencies of the 28 personal competencies that were repeatedly listed by academic health sciences library directors are included in Table 2.

Table 2

Frequency of Personal Competencies Repeatedly Listed by Academic Health Sciences Library Directors in Round 1

Personal Competency	Frequency
Ability to work well with users and colleagues, individually or in teams	8
Flexibility	5
Service-orientation	5
Intellectual curiosity	4
Interest in lifelong learning and professional development	4
Strong communication skills, both written and verbal	4
Comfortable with ambiguity	3
Open-minded	3
Passion and enthusiasm for the profession	3
Professional ethics	3
Self-confidence	3
Sense of humor	3
Strong interpersonal skills	3
Ability to cope with change	2
Ability to learn new skills quickly	2
Ability to take risks	2
Compromise	2
Creativity	2
Generous	2
Honesty	2
Initiative	2
Listening skills	2
Optimist	2
Patient	2
Personal motivation	2
Positive attitude	2
Respect for confidentiality	2
Self-starter	2

Interestingly, communication and interpersonal skills along with flexibility also appeared in the listing of personal competencies that were repeated by academic health sciences library directors as seen in Table 2. In terms of personal competencies, the most frequently listed included ability to work well with users and colleagues, flexibility, and service-orientation.

In Part II of the questionnaire, the academic health sciences library directors

provided demographic information. Table 3 provides an overview of the demographics

of the panel. In summary, the most of the 13 panel members were female, in the age

range of 50-64, white, held a master's degree in library and information sciences, and

had less than 20 years of experience as a director of an academic health sciences

library.

Table 3

Demographic Characteristics of the Members of the Academic Health Sciences Library
Directors Panel (n=13)

Characteristic	Frequency	%
Gender		
Female	9	69.2
Male	4	30.8
Age		
50-54	4	30.8
55-59	4	30.8
60-64	4	30.8
65 and over	1	7.7
Race/Ethnicity		
African-American	1	7.7
White	12	92.3
Degrees Held		
Master's degree in Library and Information Sciences	13	100.0
Master's degree in Public Health	2	15.2
Master's degree in Business Administration	1	7.7
Years of Experience – Director, Academic Health Sciences Library		
1-5 years	2	15.4
6-10 years	5	38.5
11-15 years	2	15.4
16-20 years	2	15.4
20-24 years	2	15.4

All 13 (100%) of the academic health sciences library directors reported being

members of the Medical Library Association, with 9 (69.2%) being members of the

association for more than 25 years. In addition, 7 (53.8%) of the directors were members of the American Medical Informatics Association (AMIA), 7 (53.8%) of the directors were members of the American Library Association (ALA), and 2 (15.4%) of the directors were members of the Special Libraries Association (SLA). In the other category, 7 (53.8%) directors reported being members of the Association of Academic Health Sciences Libraries (AAHSL) and 5 (38.5%) directors reported being members of their regional chapter of the Medical Library Association.

The directors completed their master's degrees in library and information sciences at many different educational institutions. The only institution mentioned more than once was the University of Michigan, which was listed by two directors. Just more than half of the panel members (7 or 53.8%) took specialized courses in health sciences or medical librarianship in their library and information sciences master's degree programs.

Regarding the academic health sciences library directors' career experience, all 13 (100%) of the directors reported having experience in administration. The next top areas of experience included: reference and instruction (11 or 84.6%), collection development (10 or 79.2%), and outreach (9 or 69.2%). All but one of the directors (12or 92.3%) had the word "director" in his/her job title. In addition, the majority of the directors (9 or 69.2%) held academic appointments in addition to their director position, with two as professors, two as associate professors, one assistant professor, and one adjunct instructor. Three directors held other academic appointments, including research instructor, senior librarian, and librarian (equivalent to professor). Only one (7.7%) of the directors taught health sciences librarianship courses at a school of library

and information sciences, and this individual taught a course titled "Health Sciences Librarianship."

LIS Educators Specializing in Health Sciences Librarianship Education

In Part I of the questionnaire, the LIS educators listed 82 professional competencies and 79 personal competencies. These competencies were analyzed and condensed to 65 professional competencies and 57 personal competencies after removing duplicate or similar items. The competencies were also modified for clarity of thought when needed; however, in most cases, the language used by the panelists was kept intact. For example, one panelist listed "Understanding the scholarly publishing process," and it was modified to "Understanding of the scholarly publishing process." The frequencies of the 14 professional competencies that were repeatedly listed by the LIS educators are included in Table 4.

Table 4

Frequency of Repeated Professional Competencies Listed by LIS Educators Specializing in Health Sciences Librarianship Education in Round 1

Professional Competency	Frequency
Knowledge of health information sources & services	6
Knowledge of medical terminology	4
Strong oral and written communication skills	4
Understanding of current telecommunications and information technologies	4
Understanding of the current health care environment	4
Basic knowledge of public services	2
Basic understanding of fiscal management	2
Basic understanding of management principles	2
Collection development and management skills	2
Instructional skills	2
Marketing research and application skills	2
Problem-solving skills	2

(*table continues*)

Table 4 (*continued*).

Professional Competency	Frequency
Professionalism	2
Strong interpersonal skills, both with clients and staff	2

Looking at the frequencies listed in Table 4, the LIS educators listed

competencies related to health information sources and services, medical terminology,

oral and written communication skills, telecommunications and information

technologies, and the current healthcare environment most frequently. The frequencies

of the 14 personal competencies that were repeatedly listed by the LIS educators are

included in Table 5

Table 5

Frequency of Repeated Personal Competencies Listed by LIS Educators Specializing in Health Sciences Librarianship Education in Round 1

Personal Competency	Frequency
Ability to communicate effectively	4
Intelligence	4
Empathy	3
Strong motivation for lifelong learning	3
Ability to embrace and adapt to change	2
Ability to see the big picture	2
Confidence	2
Creativity	2
Critical thinker	2
Curiosity	2
Enthusiasm	2
Persistence	2
Personal integrity	2
Sense of humor	2

Communication was the personal competency most frequently listed by the LIS

educators, as seen in Table 5. In terms of personal competencies, the other most

frequently listed included intelligence, empathy, and strong motivation for lifelong

learning.

In Part II of the questionnaire, the LIS educators provided demographic

information. Table 6 provides an overview of the demographics of the panel. In

summary, most of the eight panel members were female, in the age range of 45-64,

white, held a master's degree in library and information sciences and a doctor of

philosophy degree, worked less than 15 years in academic health sciences libraries,

worked less than 20 years as a full-time library and information sciences educator, and

held the rank of associate professor or professor.

Table 6

Demographic Characteristics of the Members of the LIS Educators Panel (n=8)

Characteristic	Frequency	%
Gender		
Female	6	75.0
Male	2	25.0
Age		
40-44	1	12.5
45-49	2	25.0
55-59	1	12.5
60-64	3	37.5
65 and over	1	12.5
Race/Ethnicity		
White	13	100.0
Degrees Held		
Master's degree in Library and Information Sciences	8	100.0
Master's degree in another discipline	3	37.5
Doctor of Philosophy	6	75.0
Doctor of Education	1	12.5
Doctor of Library Science	1	12.5
Years of Experience – Academic Health Sciences Library		
1-5 years	2	25.0
6-10 years	2	25.0
11-15 years	1	12.5

(*table continues*)

Table 6 (continued).

Characteristic	Frequency	%
16-20 years	1	12.5
No experience	2	25.0
Years of Experience – Faculty Member		
1-5 years	2	25.0
6-10 years	2	25.0
11-15 years	1	12.5
16-20 years	2	25.0
25 or more years	1	12.5
Faculty Rank		
Assistant Professor	2	25.0
Associate Professor	4	50.0
Professor	2	25.0

The majority of the LIS educators (6 or 75%) were members of the Medical

Library Association, with 4 (66.7%) being members for more than 16 years. In addition,

5 (62.5%) LIS educators were members of the Association for Library and Information

Science Education (ALISE). Half of the LIS educators (4 or 50%) were also members of

the American Library Association (ALA) and the American Society for Information

Science and Technology (ASIST). Three (37.5%) LIS educators were members of the

American Medical Informatics Association, and 2 (25%) were members of the Special

Libraries Association (SLA). In the other category, 2 (25%) LIS educators indicated

they were members of local, state, and regional associations.

Regarding their library career experience, 6 LIS educators (75%) had worked in

an academic health sciences library, and 2 LIS educators (25%) had never worked in an

academic health sciences library. The 6 LIS educators with academic health sciences

library experience had worked in administration and reference and instruction. Half of

the 6 (3 or 50%) had worked in cataloging, collection development, and outreach. In

terms of their job titles, all 8 (100%) had the term "professor" included, but three (37.5%) also had the term "director" in their titles.

The LIS educators teach a variety of courses related to health sciences librarianship at their schools of library and information sciences. Five LIS educators (62.5%) teach courses providing an introduction to health sciences librarianship, and five (62.5%) teach courses related to resources and services in the health sciences. Other courses that are taught include: consumer health information, medical informatics, and management in health sciences libraries.

The LIS educators completed their master's degrees in library and information sciences at eight distinct institutions of higher education. More than half of the panel members (5 or 62.5%) took specialized courses in health sciences or medical librarianship in their library and information sciences master's degree programs.

LIS Adjuncts/Health Sciences Librarianship Practitioners

The LIS adjunct faculty/health sciences librarianship practitioners listed 85 professional competencies and 79 personal competencies, which were analyzed and condensed to 48 professional competencies and 65 personal competencies after removing duplicate or similar items. The competencies were also modified for clarity of thought when needed; however, in most cases, the language used by the panelists was kept intact. For example, one panelist listed "Curious," and it was modified to "Curiosity." The frequencies of the 16 professional competencies that were repeatedly listed by the LIS adjunct faculty/health sciences librarianship practitioners are included in Table 7.

Table 7

Frequency of Repeated Professional Competencies Listed by LIS Adjunct Faculty/Health Sciences Librarianship Practitioners in Round 1

Professional Competency	Frequency
Teaching and instructional design skills, including knowledge of Pedagogy	7
Oral and written communication skills	6
Proficiency with and interest in current and emerging technologies	5
Strong knowledge of the health sciences literature, including print and electronic resources	5
Competence and skill in team-based collaborative activities	4
Knowledge of health sciences environment and trends	4
Basic information management skills	3
Database searching skills	3
Understanding of evidence-based medicine	3
Basic reference skills, including interviewing, retrieval, and evaluation	2
Commitment to life-long learning, both knowledge and skill Development	2
Familiarity with research methods and design	2
Familiarity with Web design and usage	2
Interpersonal skills	2
Medical literature searching skills	2
Project management skills	2

As seen in Table 7, the LIS adjunct faculty/health sciences librarianship practitioners listed competencies related to instruction and communication most frequently, and the frequencies of the seven personal competencies that were repeatedly listed by the LIS adjunct faculty/health sciences librarianship practitioners are included in Table 8.

Table 8

Frequency of Repeated Personal Competencies Listed by LIS Adjunct Faculty/Health Sciences Librarianship Practitioners in Round 1

Personal Competency	Frequency
Curiosity	4
Flexibility	4
Team player	3
Ability to take risks	2
Ability to work with others in collegial and professional manner	2
Intelligent	2
Self-motivated	2

In terms of personal competencies in Table 8, the most frequently listed included curiosity, flexibility, and being a team player.

In Part II of the questionnaire, the LIS adjunct faculty/health sciences librarianship practitioners provided information about their demographics, education, and professional experience. Table 9 provides an overview of the demographics of the panel. In summary, most of the eight panel members were female, in the age range of 50-64, white, held a master's degree in library and information sciences, worked in academic health sciences libraries for more than 20 years, and worked as a part-time faculty member for a school of library and information sciences for less than 10 years.

Table 9

Demographic Characteristics of the Members of the LIS Adjunct Faculty/Health Sciences Librarianship Practitioners Panel (n=8)

Characteristic	Frequency	%
Gender		
Female	5	62.5
Male	3	37.5
Age		
40-44	1	12.5

<div align="right">(table continues)</div>

Table 9 (*continued*).

Characteristic	Frequency	%
50-54	2	25.0
55-59	3	37.5
60-64	2	25.0
Race/Ethnicity		
White	8	100.0
Degrees Held		
Master's degree in Library and Information Sciences	8	100.0
Master's degree in Public Health	1	12.5
Master's degree in another discipline	2	25.0
Doctor of Philosophy	2	25.0
Years of Experience – Academic Health Sciences Library		
11-15 years	1	12.5
16-20 years	1	12.5
20-24 years	2	25.0
25 or more years	4	50.0
Years of Experience – Faculty Member		
1-5 years	1	12.5
6-10 years	5	62.5
16-20 years	1	12.5
25 or more years	1	12.5

All 8 of the LIS adjunct faculty/health sciences librarianship practitioners (100%) reported being members of the Medical Library Association, with half (4 or 50%) being members for 25 or more years. Two (25%) LIS adjunct faculty/health sciences library directors were members of the American Medical Informatics Association (AMIA), 1 (12.5%) was a member of the American Library Association (ALA), and 1 (12.5%) was a member of the Special Libraries Association (SLA). Six (75%) LIS adjunct faculty/health sciences librarianship practitioners reported being members of associations other than the one listed, with 2 (25%) being members of the American Public Health Association (APHA), 2 (25%) being members of the South Central Chapter of the Medical Library Association (SCC/MLA), and 2 (25%) being members of state library associations.

Regarding their library career experience, all 8 (100%) LIS adjunct faculty/health sciences librarianship practitioners had worked in reference and instruction and outreach. Seven (87.5%) had experience in administration, and 5 (62.5%) had experience in interlibrary loan. Most of the LIS adjunct faculty/health sciences librarianship practitioners (5 or 62.5%) had the term "director" in their job titles. The LIS adjunct faculty/health sciences librarianship practitioners work as part-time faculty members for a variety of schools of library and information sciences, but 2 (25%) reported working for the University of North Texas. The courses they teach on a part-time basis include evidence-based medicine, health sciences librarianship, health information management, consumer health information, community-based health information, and health sciences resources.

The LIS adjunct faculty/health sciences librarianship practitioners completed their master's degrees in library and information sciences at eight distinct institutions of higher education. More than half of the panel members (5 or 62.5%) took specialized courses in health sciences or medical librarianship in their library and information sciences master's degree programs.

Round 2

Using the results from the first round questionnaires, the second round questionnaires were developed for each panel. In the second round questionnaires, the three panels of experts rated the professional and personal competencies identified in Round 1 on a scale from 5 to 1, where 5 is *critically important*, 4 is *very important*, 3 is *important*, 2 is *not very important*, and 1 is *not important*. The Cronbach's alpha reliability coefficients for the professional and personal competency items of the three

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Round 2 questionnaires were calculated to determine the reliability. The Cronbach's alphas for the 88 professional competency items (academic health sciences library directors); 65 professional competency items (LIS educators); and 48 professional competency items (LIS adjunct faculty/health sciences librarianship practitioners) were .938, .972, and .955, respectively. The Cronbach's alphas for the 94 personal competency items (academic health sciences library directors); 57 personal competency items (LIS educators); and 65 personal competency items (LIS adjunct faculty/health sciences librarianship practitioners) were .968, .973, and .978, respectively. The Cronbach's alphas indicated a high level of reliability. The results of the second round questionnaires are detailed in the subsequent sections.

<center>*Academic Health Sciences Library Directors*</center>

The academic health sciences library directors rated 88 professional competencies and 94 personal competencies developed from the first round questionnaire. The median score and interquartile range (IQR) of the academic health sciences library directors' ratings for each professional and personal competency was calculated (see Appendix N and O for the tables of median ratings and IQRs for the professional and personal competencies).

Professional Competencies

Twelve out of 88 (13.6%) professional competencies received a median score of 5 – *critically important* and had an IQR less than 1, indicating consensus on those items. No professional competencies received a median score of 1 – *not important*, but 7 out of 88 (8%) professional competencies received a median rating of 2 – *not very*

important and had an IQR less than 1. The experts did not achieve consensus on 14 out

of 88 (15.9%) professional competencies, as these items had an IQR greater than 1.

Personal Competencies

Thirty out of 94 (31.9%) personal competencies had a median score of 5 –

critically important and an IQR less than 1, indicating consensus on these items. None

of the personal competencies had a median score of 1 – *not important*, but one

personal competency, "Basic supervision skills," had a median score of 2 – *not very*

important and an IQR less than 1. The experts did not achieve consensus on 19 out of

94 (20.2%) personal competencies, as these items had an IQR greater than 1.

Interestingly, there were some areas of overlap between the professional and

personal competencies with a median score of 5 – *critically important* and an IQR of

less than 1. Being able to work with others, interpersonal skills, flexibility, open-

mindedness, and being a team player were rated as critically important in both the

professional and personal competency listings.

<center>*LIS Educators Specializing in Health Sciences Librarianship Education*</center>

The LIS educators rated 65 professional competencies and 57 personal

competencies developed from the first round questionnaire. The median score and

interquartile range (IQR) of the LIS educators' ratings for each professional and

personal competency were calculated (see Appendix P and Q for the tables of median

ratings and IQRs for the professional and personal competencies).

Professional Competencies

Eighteen out of 65 (27.7%) professional competencies received a median score

of 5 – *critically important* and had an IQR less than 1, indicating consensus on those

<center>80</center>

items. None of the professional competencies received a median score of 1 – *not important* or 2 – *not very important*. The experts did not achieve consensus on 27 out of 65 (41.5%) professional competencies, as these items had an IQR greater than 1.

Personal Competencies

Twenty-two out of 57 (38.6%) personal competencies had a median score of 5 – *critically important* and an IQR less than 1, indicating consensus on these items. None of the personal competencies received a median score of 1 – *not important* or 2 – *not very important*. The experts did not achieve consensus on 18 out of 57 (31.6%) personal competencies, as these items had an IQR greater than 1.

Interestingly, there were some areas of overlap between the professional and personal competencies with a median score of 5 – *critically important* and an IQR of less than 1. Critical thinking skills, lifelong learning skills, professionalism, ethical practice, interpersonal skills, communication skills, and being a team player were rated as critically important in both the professional and personal competency listings.

LIS Adjunct Faculty/Health Sciences Librarianship Practitioners

The LIS adjunct faculty/health sciences librarianship practitioners rated 48 professional competencies and 65 personal competencies developed from the first round questionnaire. The median score and interquartile range (IQR) for each professional and personal competency were calculated (see Appendix R and S for the tables of median ratings and IQRs for the professional and personal competencies).

Professional Competencies

Two out of 48 (4.2%) professional competencies received a median score of 5 – *critically important* and had an IQR less than 1, indicating consensus on those items.

None of the professional competencies received a median score of 1 – *not important* or 2 – *not very important*. The experts did not achieve consensus on 12 out of 48 (25%) professional competencies, as these items had an IQR greater than 1.

Personal Competencies

Four out of 65 (6.2%) personal competencies had a median score of 5 – *critically important* and an IQR less than 1, indicating consensus on these items. None of the personal competencies received a median score of 1 – *not important* or 2 – *not very important*. The experts did not achieve consensus on 22 out of 65 (33.8%) personal competencies. Unlike the academic health sciences library directors and LIS educators, there was no overlap between the professional and personal competencies rated as critically important in this panel of experts.

<div align="center">Round 3</div>

Using the results from the second round questionnaires, the third round questionnaires were developed for each panel. In the third round questionnaires, the three panels of experts re-rated the professional and personal competencies on the same scale from 5 to 1 used in Round 2. In Round 3, the experts were provided with the median scores for each professional and personal competency calculated from the ratings in Round 2. The Cronbach's alpha reliability coefficients for the professional and personal competency items of the three Round 3 questionnaires were calculated to determine the reliability. The Cronbach's alphas for the 88 professional competency items (academic health sciences library directors); 65 professional competency items (LIS educators); and 48 professional competency items (LIS adjunct faculty/health sciences librarianship practitioners) were .857, .963, and .897, respectively. The

Cronbach's alphas for the 94 personal competency items (academic health sciences library directors); 57 personal competency items (LIS educators); and 65 personal competency items (LIS adjunct faculty/health sciences librarianship practitioners) were .872, .958, and .937, respectively. The Cronbach's alphas indicated a high level of reliability. The results of the third round questionnaires are detailed in the subsequent sections.

Academic Health Sciences Library Directors

The academic health sciences library directors re-rated 88 professional competencies and 94 personal competencies identified in Round 1 and were provided with the median score for each competency from Round 2. Table 10 provides the medians and IQRs for each professional competency from Rounds 2 and 3 for comparison. Table 11 provides the median scores and IQRs for each personal competency from Rounds 2 and 3 for comparison.

Table 10

Comparison of the Median Scores and Interquartile Ranges of the Professional Competencies Rated by Academic Health Sciences Library Directors in Rounds 2 and 3

	Round 2		Round 3	
Professional Competency	*Mdn*	IQR	*Mdn*	IQR
Ability to conduct research in librarianship	3	1	3	1
Ability to design information systems for delivering scholarly information to users	3	2	3	1
Ability to determine and meet the information needs of users	4	1	4	1
Ability to develop, build, and evaluate Web content	3	2	3	0
Ability to effectively teach library users	4	1	4	0
Ability to engage users and colleagues about issues addressing organization and delivery topics	3	1	4	1
Ability to identify and select quality health information for respective audiences (health care providers, researchers, students, patients and their families, the lay public	4	3	4	0
Ability to integrate into the institutional community	4	1	4	1

(*table continues*)

Table 10 (*continued*).

Professional Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Ability to interpret user needs and devise innovative services to meet those needs	4	1	4	0
Ability to organize content and structure records	4	1	4	1
Ability to organize quality health information for easy user access	4	1	4	1
Ability to plan and evaluate library services, resources, staff and report specific outcomes	3	2	3	1
Ability to read and understand basic medical articles	3	2	3	0
Ability to retrieve, assess, and articulate information	4	1	4	1
Ability to understand complex concepts and translate them into instruction	4	1	4	1
Ability to use technology to enhance job responsibilities	4	1	4	1
Ability to work alone and as part of a team	5	1	5	0
Ability to work as a team player with all levels of employees	5	1	5	0
Ability to write a basic grant application	2	1	2	0
Awareness of current issues in scholarly publishing	3	1	3	0
Basic understanding of the 5-step process of evidence-based librarianship	3	1	3	2
Basic understanding of translational medicine cycle	3	1	3	1
Basics of learning and keeping up-to-date on databases	4	2	4	1
Conversant with intellectual property law and history	3	1	3	0
Creativity	4	1	4	0
Detail-oriented	4	1	4	1
Emotional intelligence	5	1	5	0
Excellent interpersonal skills	5	0	5	1
Expert searching skills	4	2	3	1
Familiarity with basic medical texts	3	1	3	1
Familiarity with social networking tools	3	1	3	1
Financial literacy skills	2	1	2	1
Flexibility	5	0	5	0
General knowledge of academic health center operations	3	1	3	0
General knowledge of library operations	3	0	3	0
Inquisitive nature	5	1	5	1
Knowledge and ability to do data analysis	2	1	3	0
Knowledge and ability to do data mining	2	1	2	1
Knowledge and appreciation of medical informatics principles and best practices	3	2	3	0
Knowledge of and use of current, new, and emerging technologies having an impact on services/resources	4	1	4	0
Knowledge of budgeting	2	1	2	0
Knowledge of cataloging and metadata	3	0	3	0
Knowledge of database searching basics	4	1	4	0
Knowledge of database structure	3	1	4	1
Knowledge of ethical issues	4	1	4	0
Knowledge of health information literacy	3	1	3	0
Knowledge of health sciences information resources and services	4	1	4	2
Knowledge of health sciences subject matter	3	1	3	1
Knowledge of how medicine "works"	3	1	3	0
Knowledge of issues and trends in health sciences environment	4	1	3	1
Knowledge of legal and policy issues, such as copyright	3	1	3	0
Knowledge of medical terminology	3	2	3	1

(*table continues*)

Table 10 (*continued*).

Professional Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Knowledge of PubMed	4	1	4	1
Knowledge of retrieval systems, including both licensed and open resources	4	1	4	1
Knowledge of the health sciences culture	3	1	5	1
Knowledge of the history of librarianship	2	1	2	1
Knowledge of the structure and nature of information, especially in the health sciences	3	1	3	1
Knowledge of trends in health sciences libraries	3	0	3	0
Knowledge of Web design principles	3	0	3	1
Knowledge of Web-based information delivery, including Web 2.0/3.0 tools	3	1	4	1
Learning skills	5	1	5	0
Literature searching skills	4	1	4	1
Negotiation skills	3	2	3	1
Networking skills	5	1	5	1
Open-mindedness	5	1	5	0
Oral presentation skills	4	1	4	1
Organizational skills	5	1	5	1
Organized inquiry skill	4	1	4	0
Patience	4	1	4	0
Political skills	3	1	3	1
Problem-solving and analytical skills	5	1	5	1
Project management skills	4	2	4	1
Reference interview skills	5	2	4	1
Science or clinical background	2	2	2	1
Sense of humor	4	1	4	0
Strong computer and technical skills	4	2	4	1
Technical (not creative) writing skills	4	1	4	1
Time management skills	4	1	4	1
Understanding and application of library management	3	0	3	2
Understanding of basic management and leadership principles	3	1	3	0
Understanding of research methods	3	1	3	1
Understanding of scholarly communications systems	4	1	3	0
Understanding of the controlled vocabulary of health sciences	3	1	3	1
Understanding of the historical context for libraries	2	1	2	1
Understanding of the organizational scheme of library resources	3	1	3	1
Understanding of user information seeking behaviors	4	0	4	0
Willingness to learn	5	0	5	0
Written, oral, and web-based communication skills	4	1	4	1

As seen in Table 10, the academic health sciences library directors were not in consensus regarding 14 out of 88 (15.9%) professional competencies in Round 2, but they moved into consensus on all the items in Round 3. Also, directors were in consensus about three professional competencies in Round 2, but in Round 3, they

were no longer in consensus about these items. The directors did not reach consensus

on a total of 3 out of 88 (3.4%) professional competencies in Round 3.

Thirteen of the 88 (14.6%) professional competencies were re-rated as 5 –

critically important in Round 3, which is an increase of one from Round 2. Seven of the

88 (8.0%) professional competencies were re-rated as 2 – *not very important*, which is a

decrease of one from Round 2. Overall, four professional competencies were re-rated

with a lower median score, and five professional competencies were re-rated with a

higher median score.

Table 11

*Comparison of the Median Scores and Interquartile Ranges of the Personal
Competencies Rated by Academic Health Sciences Library Directors in Rounds 2 and 3*

Personal Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Ability and interest in networking	4	1	4	1
Ability to compromise	4	1	4	1
Ability to cope with change	5	1	5	0
Ability to face conflict successfully	4	1	4	1
Ability to focus	4	1	4	1
Ability to laugh at self	4	1	4	1
Ability to learn from mistakes	4	1	4	1
Ability to learn independently	5	1	5	0
Ability to learn new skills quickly	4	1	4	1
Ability to offer constructive criticism	4	1	4	1
Ability to quickly determine the most efficient way to solve problems	4	1	4	2
Ability to see the big picture as well as the little details	4	1	4	0
Ability to take risks	4	1	4	1
Ability to think strategically	4	1	4	0
Ability to understand users' behavior and needs	4	1	4	1
Ability to work well with users and colleagues, individually or in teams	5	1	5	0
Acceptance of other people's differences	4	2	4	1
Accountability	5	1	5	0
Ambition for self-improvement and growth	5	1	5	1
Analytic or problem-solving skills	5	2	5	1
Appreciation of diversity	4	1	4	1
Basic supervision skills	2	1	2	0
Balance	3	2	3	1
Collegiality	4	1	4	1
Comfortable with ambiguity	5	1	5	1

(*table continues*)

Table 11 (*continued*).

Personal Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Command of web-development tools and strategies	3	2	3	1
Creativity	4	2	4	1
Desire to achieve	4	1	4	1
Desire to do best	5	1	5	0
Desire to help	4	2	4	1
Desire to learn	5	0	5	0
Eagerness	4	1	4	1
Effective computer, computing and other technical skills	4	2	4	0
Effective teaching skills	4	1	4	0
Embraces new things	4	1	5	1
Enthusiasm	4	1	4	1
Entrepreneurial skills	3	1	3	1
Ethical values	5	1	5	0
Excellence	4	2	4	1
Flexibility	5	0	5	0
Focus on quality and quality improvement	4	2	4	1
Friendly	3	2	4	1
Generous in spirit	3	1	4	1
Helpful	4	2	5	1
Honesty	5	1	5	0
Hopefulness	4	1	4	1
Initiative	5	1	5	0
Innovative	4	1	4	0
Inquisitive	4	1	4	1
Integrity	5	1	5	0
Intellectual curiosity	5	1	5	0
Interest in lifelong learning and professional development	5	1	5	1
Listening skills	5	1	5	0
Non-judgmental	4	1	4	1
Not easily offended	4	2	4	0
Open-minded	5	1	5	0
Optimist	4	1	4	0
Organizational/project management skills	4	1	4	1
Organized	4	1	4	1
Outgoing	4	1	4	1
Passion and enthusiasm for the profession	5	1	5	0
Patient	4	1	4	1
Pays attention to details	4	1	4	0
Perseverance	4	1	4	1
Personable	4	2	4	0
Personal motivation	5	1	5	0
Positive attitude	5	1	5	0
Potential to assume leadership responsibility	3	0	3	0
Professional demeanor	5	1	5	1
Professional engagement	4	2	4	0
Professional ethics	5	2	5	0
Recognition that there's always something to learn	5	1	5	0
Respect for confidentiality	5	0	5	0

(*table continues*)

Table 11 (*continued*).

Personal Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Respect for others	5	0	5	0
Self-confidence	4	1	4	0
Self-direction	5	1	5	0
Self-motivated	5	1	5	0
Self-starter	4	1	4	1
Sense of humor	4	1	4	1
Service-orientation	4	1	4	1
Stamina	4	1	4	2
Strong communication skills, both written and verbal	5	0	5	0
Strong interpersonal skills	5	1	5	0
Tactfulness	4	2	4	0
Team player	5	1	5	0
Tolerance of disagreements or differences	4	1	4	1
Understanding of basic world knowledge	3	0	3	1
Values contributions to the profession	3	1	4	1
Vision	4	1	4	1
Volunteer attitude	3	2	3	1
Well-rounded	4	2	4	0
Willing to go above and beyond	4	2	4	1
Willing to share ideas and suggestions	5	1	5	0
Willingness to pilot new projects	4	1	4	1

As seen in Table 11, the academic health sciences library directors were not in consensus regarding 19 out of 94 (20.2%) personal competencies in Round 2, but they moved into consensus on all the items in Round 3. Also, the directors were in consensus about two personal competencies in Round 2, but in Round 3, they were no longer in consensus about these items. The directors did not reach consensus on a total of 2 out of 94 (2.3%) personal competencies.

Thirty-three of the 94 (35.1%) personal competencies were re-rated as 5 – *critically important* in Round 3, which is an increase of three from Round 2. Only one personal competency was re-rated as 2 – *not very important*, which is the same personal competency as in Round 2. Overall, no personal competencies were re-rated with a lower median score, but four personal competencies were re-rated with a higher median score.

The LIS educators specializing in health sciences librarianship education re-rated 65 professional competencies and 57 personal competencies identified in Round 1 and were provided with the median score for each competency from Round 2. Table 12 provides the medians and IQRs for each professional competency from Rounds 2 and 3 for comparison. Table 13 provides the median scores and IQRs for each personal competency from Rounds 2 and 3 for comparison.

Table 12

Comparison of the Median Scores and Interquartile Ranges of the Professional Competencies Rated by LIS Educators in Rounds 2 and 3

Professional Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Ability and willingness to acquire domain knowledge as required	5	1	5	0.5
Ability to advocate	4	1.5	4.5	1.5
Ability to be a good fit with existing group of colleagues	4	2	5	1
Ability to keep up-to-date with new information in the field	5	0	5	0
Ability to learn quickly	5	0.5	5	0.5
Ability to network with administrators	4	1	4	1.5
Ability to network with other health care librarians	4	1	5	1
Ability to plan your own professional development	4	1.5	4.5	1
Ability to plan, execute, and publish results from a simple scholarly research project	4	1.5	4	1
Ability to relate research to clinical care and the community	3.5	1.5	4	1
Ability to think outside the walls of the library	5	0.5	5	0.5
Ability to work with people on different committees	5	1	5	1
Active listening skills	5	0.5	5	0
Basic knowledge of public services	4	1	4	0.5
Basic knowledge of technical services	3	1.5	3	1
Basic knowledge of the health care professions	5	1.5	5	0
Basic understanding of fiscal management	3	0.5	3	1
Basic understanding of management principles	3	1	3	1
Basic understanding of the theoretical and practical foundations of our field	3.5	2	5	1
Collection development and management skills	3.5	1.5	4	0.5
Creativity	5	1.5	5	1
Curiosity	4.5	1	5	1
Information retrieval skills	5	1	5	0.5
Instructional skills	4	1	4	1
Knowledge of all the competencies required for ALA-accredited LIS master's programs	4	1.5	4	1
Knowledge of basic legal and ethical principles	4	1	4	0.5

(*table continues*)

Table 12 (*continued*).

Professional Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Knowledge of bioinformatics	3	2	3	0
Knowledge of biostatistics/epidemiology	2.5	2	3	0.5
Knowledge of data mining	3	1.5	3	1.5
Knowledge of health information sources and services	5	1.5	5	0.5
Knowledge of how the library is positioned within a health sciences or healthcare institution	5	1	5	1
Knowledge of medical terminology	4.5	1.5	5	1
Knowledge of serials acquisition and management	3	1	4	1
Knowledge of the information needs of health care professionals	5	1.5	5	0
Lifelong learning skills	5	1	5	0
Marketing research and application skills	3.5	1	3.5	2
MEDLINE search skills	5	1	5	0
Outreach skills	4	1	4	0.5
Problem-solving skills	5	1	5	0
Professional attitude and outlook	5	0.5	5	0
Professional demeanor	4	1.5	5	0
Professional integrity and ethics	5	0	5	0.5
Professionalism	5	0	5	1
Proficient in using Microsoft Office products	4	1	4	0
Strong interpersonal skills, both with clients and staff	5	0	5	0
Strong oral and written communication skills	5	0	5	0.5
Understanding of advanced knowledge management systems	3	1	3	1.5
Understanding of bibliographic control	4	1	4	0.5
Understanding of current telecommunications and information technologies	4	0.5	4	0.5
Understanding of evidence-based medicine	4	1.5	4	1
Understanding of informatics, both academic and applied	4	1	3.5	1
Understanding of professional context of medicine	4	2	5	1
Understanding of professional roles and issues	4	1.5	4	1
Understanding of systems analysis and systems thinking	3.5	1	3	0.5
Understanding of the basic concepts of health care administration	4	1.5	4	0
Understanding of the credentialing processes for health professionals	3.5	1.5	4	1
Understanding of the cultural infrastructure of universities and health care	4.5	1.5	4	1
Understanding of the current health care environment	4.5	1.5	5	1
Understanding of the principles of data, information & knowledge organization	4	1.5	4	1
Understanding of the scholarly publishing process	4	1.5	4	0
Understanding of the technology issues in an electronic environment, such as privacy and security	4	0.5	4	1
Understanding the structure of complex bibliographic databases	4	0.5	4	1
Web site creation skills	3	1	3	0
Willingness to be a team player or collaborator	5	1	5	0

As seen in Table 12, the LIS educators were not in consensus regarding 27 out of 65 (41.5%) professional competencies in Round 2, but they moved into consensus on 25 of the items in Round 3. Two professional competencies were out of consensus in Round 2 and remained out of consensus in Round 3. Also, the educators were in

consensus about three professional competencies in Round 2, but in Round 3, they were no longer in consensus about these items. The educators did not reach consensus on a total of 5 out of 65 (7.8%) professional competencies.

Thirty of the 65 (46.2%) professional competencies were re-rated as 5 – *critically important* in Round 3, which is an increase of 12 from Round 2. Overall, 3 professional competencies were re-rated with a lower median score, and 14 professional competencies were re-rated with a higher median score.

Table 13

Comparison of the Median Scores and Interquartile Ranges of the Personal Competencies Rated by LIS Educators in Rounds 2 and 3

	Round 2		Round 3	
Personal Competency	*Mdn*	IQR	*Mdn*	IQR
Ability to communicate effectively	5	0	5	0
Ability to deal with "high-powered" clientele	4.5	1.5	5	1
Ability to embrace and adapt to change	5	1	5	0
Ability to fit into an existing group of colleagues	4.5	2	4.5	1
Ability to multi-task	4.5	1	4	0.5
Ability to see the big picture	4.5	1	5	1
Ambition	4	1.5	4	0.5
Analytical ability	5	1	4.5	1
Assertiveness	3.5	1.5	4	2
Belief in ethical professional practice	5	0.5	5	0
Collaborative	4.5	1	5	0.5
Comfortable getting out of the library and working on other committees	4.5	1	5	0.5
Commitment to cooperate with professionals, inside and outside of library and information sciences	5	1.5	5	0
Commitment to evidence-based practice	4	1.5	4	1.5
Confidence	4.5	1.5	4.5	1.5
Creativity	4	1	4	1
Critical thinker	5	0	5	0.5
Curiosity	5	1	5	0.5
Dedication	4	1	4	1
Desire to assist others	4.5	1	5	0
Diligence	4.5	1.5	4	1
Efficient time management	4.5	1	5	0
Embrace and encourage diversity	4.5	1.5	4.5	1
Emotional intelligence	5	2	4.5	1
Empathy	4	1.5	4.5	1
Enthusiasm	5	1	5	0.5
Eye for vision and mission	4	0	4	0

(*table continues*)

Table 13 (*continued*).

Personal Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Friendliness	3.5	2	4	1.5
Flexibility	5	1	5	0
General interest in people	5	1	5	0
General interest in the profession	5	2	5	0.5
Grace under pressure	4.5	1	4.5	1
Independent thinker	4.5	1	4	1
Initiative	5	1	5	0.5
Intelligence	5	1	5	0.5
Interpersonal skills	5	0	5	0
Maturity	4	1	4	1
Passion	5	2	4.5	1
Persistence	4	2	5	0.5
Personal integrity	5	0	5	0
Pleasant demeanor	3.5	1.5	4	0
Political intelligence	4	0.5	4.5	1.5
Professional passion	5	1	5	1
Professionalism	5	0	5	0
Professionally active	4	2	4	0.5
Resilience	4.5	1	4.5	1
Self-motivated	5	1	5	0
Sense of humor	3.5	1.5	4	2
Sense of responsibility	5	0.5	5	1
Strong intellect	5	1	5	0.5
Strong motivation for lifelong learning	5	1	5	0
Team player	5	1	5	0
Tenacity	4	0.5	4	1
Value service	5	1	5	0.5
Wanting to make a difference	4	1	4	1
Willingness to learn	5	0	5	0
Willingness to take creative risks	4	0.5	4.5	1.5

As seen in Table 13, the LIS educators were not in consensus regarding 18 out of 57 (31.6%) personal competencies in Round 2, but they moved into consensus on 13 of the items in Round 3. Three of the personal competencies stayed out of consensus with different IQRs than in Round 2, and two of the personal competencies stayed out of consensus with the same IQRs as in Round 2. Also, the educators were in consensus about two personal competencies in Round 2, but in Round 3, they were no longer in consensus about these items. The educators did not reach consensus on a total of 7 out of 57 (12.3%) personal competencies.

Thirty of the 57 (52.6%) personal competencies were re-rated as 5 – *critically important* in Round 3, which is an increase of eight from Round 2. Overall, 6 personal competencies were re-rated with a lower median score, and 14 personal competencies were re-rated with a higher median score.

LIS Adjunct Faculty/Health Sciences Librarianship Practitioners

The LIS adjunct faculty/health sciences librarianship practitioners re-rated 48 professional competencies and 65 personal competencies identified in Round 1 and were provided with the median score for each competency from Round 2. Table 14 provides the medians and IQRs for each professional competency from Rounds 2 and 3 for comparison. Table 15 provides the median scores and IQRs for each personal competency from Rounds 2 and 3 for comparison.

Table 14

Comparison of the Median Scores and Interquartile Ranges of the Professional Competencies Rated by LIS Adjunct Faculty/Health Sciences Librarianship Practitioners in Rounds 2 and 3

Professional Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Ability to apply theory	3	1	3	0
Ability to build Web documents, including blogs, libguides, and other non-programming interfaces	4	1.5	4	1
Ability to critically assess clinical research articles	4	0	3	0
Ability to evaluate the various users in a health setting	3.5	1.5	4	1
Ability to innovate	4	1.5	4	0.5
Ability to match health information needs with available information resources	4	0.5	4.5	1
Ability to recognize that academic health sciences librarianship requires more than 9-5 M-F commitment	4	0	3.5	1
Ability to work under pressure	4	1.5	4	0.5
Advanced computer skills	3	0.5	3.5	1
Analytical skills	4	1.5	4	0
Basic information management skills	4	1	4	0.5
Basic reference skills, including interviewing, retrieval, and evaluation	4	1	4.5	1
Commitment to being a librarian	4.5	1	4	0.5
Commitment to life-long learning, both knowledge and skill development	4	1	5	1
Common sense	5	1.5	4.5	2
Competence and skill in team-based collaborative activities	4	1	4	1

(*table continues*)

Table 14 (*continued*).

Professional Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Competence with functional and theoretical application of citation management tools	4	1	4	0.5
Database searching skills	5	0.5	5	0
Dedication	4.5	1	4	0.5
Familiarity with research methods and design	4	1.5	4	0
Familiarity with Web design and usage	3.5	1	4	1
Interpersonal skills	5	1	5	1
Knowledge about health sciences environment and trends	3.5	2	4	0.5
Knowledge about health sciences librarianship	4	1	4	0
Knowledge and competence in library acquisition, including preparation to adapt to local purchasing conventions	3	0	3	0.5
Knowledge and competence in social and cultural diversity	4	0.5	4	1
Knowledge of customer service standards for information professionals in the health care and research enterprise	4	1	4	1.5
Knowledge of information ethics and health care	4	0.5	4	1.5
Knowledge of the American Library Association (ALA) Code of Ethics	3	1.5	3	0.5
Mastery of English language competence required in a US academic health sciences campus	4	1.5	4	2
Medical literature searching skills	4	0.5	4.5	1
Oral and written communication skills	4	1	5	0.5
Proficiency with and interest in current and emerging information technologies	4.5	1	4	1
Project management skills	4.5	1	4	0.5
Resilience in attitude toward receiving feedback and expecting that most innovation faces initial resistance	4	0.5	4	0.5
Strong knowledge of the health sciences literature, including print and electronic resources	4	0.5	4	0
Strong knowledge of US health care education, especially the Accreditation Council for Graduate Medical Education (ACGME) core competencies	3.5	1	3	0.5
Teaching and instructional design skills, including knowledge of pedagogy	4	0	4	0
Theoretical and practical understanding of RSS, both for tracking emerging knowledge and building self-updating web pages	3.5	1	3	0.5
Understanding of basic descriptive and inferential statistics	3	0.5	4	1
Understanding of data organization, including the Medical Subject Headings (MeSH)	5	1	5	0.5
Understanding of database design and management	3.5	2	4	0.5
Understanding of evidence-based medicine	4	0.5	4	1
Understanding of information needs in the health sciences	4	1	4	1
Understanding of subject headings and metadata tags used in health care	4.5	1.5	4	1
Understanding of scholarly communication, including copyright and open access	3.5	1	4	1.5
Understanding of the importance of immediacy in health care and ability to react quickly	4.5	1	4.5	1
Vision	3.5	1	4	1

As seen in Table 14, the LIS adjunct faculty/health sciences librarianship

practitioners were not in consensus regarding 12 out of 48 (25.0%) professional

competencies in Round 2, but they moved into consensus on ten of the items in Round

3. Two professional competencies were out of consensus in Round 2 and remained out of consensus in Round 3 with different IQRs. Also, the LIS adjunct faculty/health sciences librarianship practitioners were in consensus about three professional competencies in Round 2, but in Round 3, the experts were no longer in consensus about these items. The LIS adjunct faculty/health sciences librarianship practitioners did not reach consensus on a total of 5 out of 48 (10.4%) professional competencies.

Five of the 48 (7.5%) professional competencies were re-rated as 5 – *critically important* in Round 3, which is an increase of three from Round 2. Overall, ten professional competencies were re-rated with a lower median score, and 13 professional competencies were re-rated with a higher median score.

Table 15

Comparison of the Median Scores and Interquartile Ranges of the Personal Competencies Rated by LIS Adjunct Faculty/Health Sciences Librarianship Practitioners in Rounds 2 and 3

Personal Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Ability to adapt to change	5	1	4.5	1
Ability to deal with fluid boundaries of field-- not set in what libraries or librarians do	4	0.5	4	0.5
Ability to identify and evaluate possible solutions to problems/barriers	4	0	4	0
Ability to improve services	4	1.5	4	1
Ability to take risks	4	1	4	0
Ability to work independently, requesting appropriate input/guidance when needed	4	0.5	4	0.5
Ability to work with others in a collegial and professional manner	4	1	4.5	1
Analytical	4	1.5	4	0.5
Application of knowledge	4	1.5	4	0.5
Appreciation of various cultural/professional contexts	4	1	4	0.5
Attention to detail	4	1.5	4	0.5
Background in the sciences	3	0	3	1
Basic reference skills	4	0	5	1
Basic technical service skills	3	0.5	3	1
Collaborative orientation	4.5	1.5	4	1
Commitment to ongoing professional development	4	1.5	4	1
Commitment to serve	4	1.5	4	1
Communication skills	4	1	4	1
Communicator	4	0.5	4	0.5

(*table continues*)

Table 15 (*continued*).

Personal Competency	Round 2		Round 3	
	Mdn	IQR	*Mdn*	IQR
Community-centered; genuinely desires consensus and harmony	4	1	4	0.5
Continuous learner; is able to keep up with changing environment	4.5	1	4.5	1
Course development skills	3	1	3.5	1
Creativity	4	2	4	0
Curiosity	4	1	4	0.5
Doggedness; never gives up	3	1.5	3	1
Emotional intelligence	4	1	4	0.5
Enthusiasm for new information technologies	4	1.5	4	0
Ethical	5	1	5	0
Fiscally aware	3	0.5	3	1
Flexibility	4.5	1	4.5	1
Generosity	3	1	3	1
Humility; ability to be wrong and admit it	4	0.5	4	1
Innovator	3	1.5	4	0.5
Intelligent	4.5	1	4	0.5
Interest in working in interprofessional teams	4	1.5	4	0.5
Interested in other people	4	1.5	4	0.5
Knowledge of important databases, such as CINAHL	4	2	4	0.5
Knowledge of medical terminology, such as MeSH	4	1.5	4	1
Leadership skills	3	0.5	4	1
Loyalty	3	1	3.5	1
Personality	3	1.5	4	1
Positive	4	2	4	0
Proactive	4.5	1	4	0.5
Professional attitude	4	1.5	4	0
Pursues a work/life balance that is sustainable	3	1	4	0.5
Repays debts of gratitude in a variety of ways	3	0.5	3	0.5
Respect	4	1.5	4	1
Searching skills for Medline in any format	4	0.5	4	1
Seeks opportunities to be involved	4	1	4	0
Seeks positive solutions	4.5	1	4	1
Self-aware	4	0.5	3.5	1
Self-confident	4	0.5	4	0.5
Self-learner	5	1	5	1
Self-motivated	5	1	5	0
Sense of humor	4	1	4	1.5
Service oriented	4	1	4.5	1.5
Social vision; looks right at customers and colleagues	3.5	1	3.5	1
Strong sense of own integrity	4.5	1.5	4	0
Teaching skills	4	0	4	1
Team player	4	1	4	1
Time management skills	4	0	4	0
Understanding of American Library Association Code of Ethics	3	1	3	0.5
Understands and honors confidentiality	5	1.5	5	0

As seen in Table 15, the LIS adjunct faculty/health sciences librarianship

practitioners were not in consensus regarding 22 out of 65 (33.8%) personal

competencies in Round 2, but they moved into consensus on all of the items in Round 3. Also, the adjunct faculty/practitioners were in consensus about two personal competencies in Round 2, but in Round 3, they were no longer in consensus about these items. The adjunct faculty/practitioners did not reach consensus on a total of 2 out of 65 (3.1%) personal competencies.

Five of the 65 (7.7%) personal competencies were re-rated as 5 – *critically important* in Round 3, which is an increase of one from Round 2. Overall, seven personal competencies were re-rated with a lower median score, and nine personal competencies were re-rated with a higher median score.

Round 4

The final lists of professional and personal competencies from each panel of experts were developed from the data collected in Round 3. The lists were developed by removing competencies that had median score of 2 or less and/or had an IQR greater than 1. The academic health sciences directors' list of professional competencies included 78 items (reduced from 88) and their list of personal competencies included 91 items (reduced from 94). The LIS educators' list of professional competencies included 60 items (reduced from 65) and their list of personal competencies included 50 personal competencies (reduced from 57). The LIS adjunct faculty/health sciences practitioners' list of professional competencies included 43 items (reduced from 48) and their list of personal competencies included 63 items (reduced from 65).

In the fourth round of the study, members of all three expert panels completed the same questionnaire to choose their preferred list of professional competencies and

their preferred list of personal competencies from the competencies developed independently by each panel. Each listing of professional and personal competencies was presented in alphabetical order in the final questionnaire. Throughout the study, the panels of experts were not aware that other groups were working on the same task through the study, so they did not know who had created each listing of competencies as the lists were labeled A, B, and C.

Of the 26 experts who completed the fourth round questionnaire, 23 (88.5%) chose the LIS educators' list of professional competencies. Two (7.7%) experts chose the LIS adjuncts/health sciences librarianship practitioners' list, and one (3.8%) chose the academic health sciences library directors' list. Regarding personal competencies, 14 out of 26 (53.8%) experts chose the LIS educators' list, 9 (34.6%) chose the LIS adjuncts/health sciences librarianship practitioners' list, and 3 (11.5%) chose the academic health sciences library directors' list.

Research Questions

The study addressed eight research questions, and the results as they relate to each question are discussed in the subsequent sections. The first six research questions of the study address the preferred professional and personal competencies needed of entry-level academic health sciences librarians from the perspectives of academic health sciences library directors, LIS educators specializing in health sciences librarianship education, and LIS adjunct faculty/health sciences librarianship practitioners. The last two research questions relate to comparing and contrasting the three panels of experts' perspectives on the preferred professional and personal competencies.

Research Question 1

The first research question was "What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of academic health sciences library directors?" The academic health sciences library directors identified a total of 131 professional competencies in Round 1 of the study, which were then analyzed and condensed to 88 professional competencies. The 88 professional competencies were rated on a scale from 5 to 1 in Round 2 and re-rated on the same scale in Round 3. At the end of Round 3, there were a total of 78 professional competencies after items with a median score of 2 or less and/or an IQR greater than 1 were eliminated. Of the 78 professional competencies, 13 (16.7%) had a median score of 5 – *critically important*, 33 (42.3%) had a median score of 4 – *very important*, and 32 (41.0%) had a median score of 3 – *important* in Round 3. Table 16 presents the final list of the academic health sciences library directors' professional competencies.

Table 16

Academic Health Sciences Library Directors' Final List of Professional Competencies with Median Scores and Interquartile Ranges (IQRs) from Round 3

	Round 3	
Professional Competency	*Mdn*	IQR
Ability to work alone and as part of a team	5	0
Ability to work as a team player with all levels of employees	5	0
Emotional intelligence	5	0
Flexibility	5	0
Learning skills	5	0
Open-mindedness	5	0
Willingness to learn	5	0
Excellent interpersonal skills	5	1
Inquisitive nature	5	1
Knowledge of the health sciences culture	5	1
Networking skills	5	1
Organizational skills	5	1
Problem-solving and analytical skills	5	1
Ability to effectively teach library users	4	0

(*table continues*)

Table 16 (*continued*).

Professional Competency	Round 3	
	Mdn	IQR
Ability to identify and select quality health information for respective audiences (health care providers, researchers, students, patients and their families, the lay public	4	0
Ability to interpret user needs and devise innovative services to meet those needs	4	0
Creativity	4	0
Knowledge of and use of current, new, and emerging technologies having an impact on services/resources	4	0
Knowledge of database searching basics	4	0
Knowledge of ethical issues	4	0
Organized inquiry skill	4	0
Patience	4	0
Sense of humor	4	0
Understanding of user information seeking behaviors	4	0
Ability to determine and meet the information needs of users	4	1
Ability to engage users and colleagues about issues addressing organization and delivery topics	4	1
Ability to integrate into the institutional community	4	1
Ability to organize content and structure records	4	1
Ability to organize quality health information for easy user access	4	1
Ability to retrieve, assess, and articulate information	4	1
Ability to understand complex concepts and translate them into instruction	4	1
Ability to use technology to enhance job responsibilities	4	1
Basics of learning and keeping up-to-date on databases	4	1
Detail-oriented	4	1
Knowledge of database structure	4	1
Knowledge of PubMed	4	1
Knowledge of retrieval systems, including both licensed and open resources	4	1
Knowledge of Web-based information delivery, including Web 2.0/3.0 tools	4	1
Literature searching skills	4	1
Oral presentation skills	4	1
Project management skills	4	1
Reference interview skills	4	1
Strong computer and technical skills	4	1
Technical (not creative) writing skills	4	1
Time management skills	4	1
Written, oral, and web-based communication skills	4	1
Ability to develop, build, and evaluate Web content	3	0
Ability to read and understand basic medical articles	3	0
Awareness of current issues in scholarly publishing	3	0
Conversant with intellectual property law and history	3	0
General knowledge of academic health center operations	3	0
General knowledge of library operations	3	0
Knowledge and ability to do data analysis	3	0
Knowledge and appreciation of medical informatics principles and best practices	3	0
Knowledge of cataloging and metadata	3	0
Knowledge of health information literacy	3	0
Knowledge of how medicine "works"	3	0
Knowledge of legal and policy issues, such as copyright	3	0
Knowledge of trends in health sciences libraries	3	0
Understanding of basic management and leadership principles	3	0
Understanding of scholarly communications systems	3	0

Table 16 (*continued*).

Professional Competency	Round 3 Mdn	Round 3 IQR
Ability to conduct research in librarianship	3	1
Ability to design information systems for delivering scholarly information to users	3	1
Ability to plan and evaluate library services, resources, staff and report specific outcomes	3	1
Basic understanding of translational medicine cycle	3	1
Expert searching skills	3	1
Familiarity with basic medical texts	3	1
Familiarity with social networking tools	3	1
Knowledge of health sciences subject matter	3	1
Knowledge of issues and trends in health sciences environment	3	1
Knowledge of medical terminology	3	1
Knowledge of the structure and nature of information, especially in the health sciences	3	1
Negotiation skills	3	1
Political skills	3	1
Understanding of research methods	3	1
Understanding of the controlled vocabulary of health sciences	3	1
Understanding of the organizational scheme of library resources	3	1

Research Question 2

The second research question was "What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of academic health sciences library directors?" The academic health sciences library directors identified a total of 137 personal competencies in Round 1 of the study, which were then analyzed and condensed to 94 personal competencies. The 94 personal competencies were rated on a scale from 5 to 1 in Round 2 and re-rated on the same scale in Round 3. At the end of Round 3, there were a total of 91 personal competencies after items with a median score of 2 or less and/or an IQR greater than 1 were eliminated. Of the 91 personal competencies, 34 (37.4%) had a median score of 5 – *critically important*, 51 (56.0%) had a median score of 4 – *very important*, and 6 (6.6%) had a median score of 3 – *important* in Round 3. Table 17 presents the final list of the academic health sciences library directors' personal competencies.

Table 17

Academic Health Sciences Library Directors' Final List of Personal Competencies with Median Scores and Interquartile Ranges (IQRs) from Round 3

Personal Competency	Round 3	
	Mdn	IQR
Ability to cope with change	5	0
Ability to learn independently	5	0
Ability to work well with users and colleagues, individually or in teams	5	0
Accountability	5	0
Desire to do best	5	0
Desire to learn	5	0
Ethical values	5	0
Flexibility	5	0
Honesty	5	0
Initiative	5	0
Integrity	5	0
Intellectual curiosity	5	0
Listening skills	5	0
Open-minded	5	0
Passion and enthusiasm for the profession	5	0
Personal motivation	5	0
Positive attitude	5	0
Professional ethics	5	0
Recognition that there's always something to learn	5	0
Respect for confidentiality	5	0
Respect for others	5	0
Self-direction	5	0
Self-motivated	5	0
Strong communication skills, both written and verbal	5	0
Strong interpersonal skills	5	0
Team player	5	0
Willing to share ideas and suggestions	5	0
Ambition for self-improvement and growth	5	1
Analytic or problem-solving skills	5	1
Comfortable with ambiguity	5	1
Embraces new things	5	1
Helpful	5	1
Interest in lifelong learning and professional development	5	1
Professional demeanor	5	1
Ability to see the big picture as well as the little details	4	0
Ability to think strategically	4	0
Effective computer, computing and other technical skills	4	0
Effective teaching skills	4	0
Innovative	4	0
Not easily offended	4	0
Optimist	4	0
Pays attention to details	4	0
Personable	4	0
Professional engagement	4	0

(*table continues*)

Table 17 (*continued).*

Personal Competency	Round 3	
	Mdn	IQR
Self-confidence	4	0
Tactfulness	4	0
Well-rounded	4	0
Ability and interest in networking	4	1
Ability to compromise	4	1
Ability to face conflict successfully	4	1
Ability to focus	4	1
Ability to laugh at self	4	1
Ability to learn from mistakes	4	1
Ability to learn new skills quickly	4	1
Ability to offer constructive criticism	4	1
Ability to take risks	4	1
Ability to understand users' behavior and needs	4	1
Acceptance of other people's differences	4	1
Appreciation of diversity	4	1
Collegiality	4	1
Creativity	4	1
Desire to achieve	4	1
Desire to help	4	1
Eagerness	4	1
Enthusiasm	4	1
Excellence	4	1
Focus on quality and quality improvement	4	1
Friendly	4	1
Generous in spirit	4	1
Hopefulness	4	1
Inquisitive	4	1
Non-judgmental	4	1
Organizational/project management skills	4	1
Organized	4	1
Outgoing	4	1
Patient	4	1
Perseverance	4	1
Self-starter	4	1
Sense of humor	4	1
Service-orientation	4	1
Tolerance of disagreements or differences	4	1
Values contributions to the profession	4	1
Vision	4	1
Willing to go above and beyond	4	1
Willingness to pilot new projects	4	1
Potential to assume leadership responsibility	3	0
Balance	3	1
Command of web-development tools and strategies	3	1
Entrepreneurial skills	3	1
Understanding of basic world knowledge	3	1
Volunteer attitude	3	1

Research Question 3

The third research question was "What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences educators who specialize in educating health sciences librarians?" The LIS educators identified a total of 82 professional competencies in Round 1 of the study, which were then analyzed and condensed to 65 professional competencies. The 65 professional competencies were rated on a scale from 5 to 1 in Round 2 and re-rated on the same scale in Round 3. At the end of Round 3, there were a total of 60 professional competencies after items with a median score of 2 or less and/or an IQR greater than 1 were eliminated. Of the 60 professional competencies, almost half (30, 50.0%) had a median score of 5 – *critically important*. In addition, 21 (35.0%) competencies had a median score of 4 – *very important*, and 7 (11.7%) competencies had a median score of 3 – *important* in Round 3. Two competencies fell in the middle of the rating scale, one (1.7%) with a median score of 4.5 and one (1.7%) with a median score of 3.5 respectively. Table 18 presents the final list of the LIS educators' professional competencies.

Table 18

LIS Educators' Final List of Professional Competencies with Median Scores and Interquartile Ranges (IQRs) from Round 3

	Round 3	
Professional Competency	*Mdn*	IQR
Ability to keep up-to-date with new information in the field	5	0
Active listening skills	5	0
Basic knowledge of the health care professions	5	0
Critical thinking skills	5	0
Knowledge of the information needs of health care professionals	5	0
Lifelong learning skills	5	0

(table continues)

Table 18 (*continued*).

Professional Competency	Round 3	
	Mdn	IQR
MEDLINE search skills	5	0
Problem-solving skills	5	0
Professional attitude and outlook	5	0
Professional demeanor	5	0
Strong interpersonal skills, both with clients and staff	5	0
Willingness to be a team player or collaborator	5	0
Ability and willingness to acquire domain knowledge as required	5	0.5
Ability to learn quickly	5	0.5
Ability to think outside the walls of the library	5	0.5
Information retrieval skills	5	0.5
Knowledge of health information sources and services	5	0.5
Professional integrity and ethics	5	0.5
Strong oral and written communication skills	5	0.5
Ability to be a good fit with existing group of colleagues	5	1
Ability to network with other health care librarians	5	1
Ability to work with people on different committees	5	1
Basic understanding of the theoretical and practical foundations of our field	5	1
Creativity	5	1
Curiosity	5	1
Knowledge of how the library is positioned within a health sciences or healthcare institution	5	1
Knowledge of medical terminology	5	1
Professionalism	5	1
Understanding of professional context of medicine	5	1
Understanding of the current health care environment	5	1
Ability to plan your own professional development	4.5	1
Proficient in using Microsoft Office products	4	0
Understanding of the basic concepts of health care administration	4	0
Understanding of the scholarly publishing process	4	0
Basic knowledge of public services	4	0.5
Collection development and management skills	4	0.5
Knowledge of basic legal and ethical principles	4	0.5
Outreach skills	4	0.5
Understanding of bibliographic control	4	0.5
Understanding of current telecommunications and information technologies	4	0.5
Ability to plan, execute, and publish results from a simple scholarly research project	4	1
Ability to relate research to clinical care and the community	4	1
Instructional skills	4	1
Knowledge of all the competencies required for ALA-accredited LIS master's programs	4	1
Knowledge of serials acquisition and management	4	1
Understanding of evidence-based medicine	4	1
Understanding of professional roles and issues	4	1
Understanding of the credentialing processes for health professionals	4	1
Understanding of the cultural infrastructure of universities and health care	4	1
Understanding of the principles of data, information & knowledge organization	4	1
Understanding of the technology issues in an electronic environment, such as privacy and security	4	1
Understanding the structure of complex bibliographic databases	4	1
Understanding of informatics, both academic and applied	3.5	1

(*table continues*)

Table 18 (*continued*).

Professional Competency	Round 3	
	Mdn	IQR
Knowledge of bioinformatics	3	0
Web site creation skills	3	0
Knowledge of biostatistics/epidemiology	3	0.5
Understanding of systems analysis and systems thinking	3	0.5
Basic knowledge of technical services	3	1
Basic understanding of fiscal management	3	1
Basic understanding of management principles	3	1

Research Question 4

The fourth research question was "What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences educators who specialize in educating health sciences librarians?" The LIS educators identified a total of 79 personal competencies in Round 1 of the study, which were then analyzed and condensed to 57 personal competencies. The 57 personal competencies were rated on a scale from 5 to 1 in Round 2 and re-rated on the same scale in Round 3. At the end of Round 3, there were a total of 50 personal competencies after items with a median score of 2 or less and/or an IQR greater than 1 were eliminated. Of the 50 personal competencies, over half (30, 60.0%) had a median score of 5 – *critically important*. In addition, eight (16.0%) competencies had a median score of 4.5, and 12 (24.0%) had a median score of 4 – *very important*. Table 19 presents the final list of the LIS educators' personal competencies.

Table 19

LIS Educators' Final List of Personal Competencies with Median Scores and Interquartile Ranges (IQRs) from Round 3

	Round 3	
Personal Competency	*Mdn*	IQR
Ability to communicate effectively	5	0
Ability to embrace and adapt to change	5	0
Belief in ethical professional practice	5	0
Commitment to cooperate with professionals, inside and outside of library and information sciences	5	0
Desire to assist others	5	0
Efficient time management	5	0
Flexibility	5	0
General interest in people	5	0
Interpersonal skills	5	0
Personal integrity	5	0
Professionalism	5	0
Self-motivated	5	0
Strong motivation for lifelong learning	5	0
Team player	5	0
Willingness to learn	5	0
Collaborative	5	0.5
Comfortable getting out of the library and working on other committees	5	0.5
Critical thinker	5	0.5
Curiosity	5	0.5
Enthusiasm	5	0.5
General interest in the profession	5	0.5
Initiative	5	0.5
Intelligence	5	0.5
Persistence	5	0.5
Strong intellect	5	0.5
Value service	5	0.5
Ability to deal with "high-powered" clientele	5	1
Ability to see the big picture	5	1
Professional passion	5	1
Sense of responsibility	5	1
Ability to fit into an existing group of colleagues	4.5	1
Analytical ability	4.5	1
Embrace and encourage diversity	4.5	1
Emotional intelligence	4.5	1
Empathy	4.5	1
Grace under pressure	4.5	1
Passion	4.5	1
Resilience	4.5	1
Eye for vision and mission	4	0
Pleasant demeanor	4	0
Ability to multi-task	4	0.5
Ambition	4	0.5
Professionally active	4	0.5

(*table continues*)

Table 19 (*continued*).

Personal Competency	Round 3	
	Mdn	IQR
Creativity	4	1
Dedication	4	1
Diligence	4	1
Independent thinker	4	1
Maturity	4	1
Tenacity	4	1
Wanting to make a difference	4	1

Research Question 5

The fifth research question was "What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?" The LIS adjunct faculty/academic health sciences librarianship practitioners identified a total of 85 professional competencies in Round 1 of the study, which were then analyzed and condensed to 48 professional competencies. The 48 professional competencies were rated on a scale from 5 to 1 in Round 2 and re-rated on the same scale in Round 3. At the end of Round 3, there were a total of 43 professional competencies after items with a median score of 2 or less and/or an IQR greater than 1 were eliminated. Of the 43 professional competencies, five (11.6%) had a median score of 5 – *critically important*, four (9.3%) had a median score of 4.5, 26 (60.5%) had a median score of 4 – *very important*, two (4.7%) had a median score of 3.5, and six (14.0%) had a median score of 3 – *important*. Table 20 presents the final list of the LIS adjunct faculty/health sciences librarianship practitioners' professional competencies.

Table 20

LIS Adjunct Faculty/Health Sciences Librarianship Practitioners' Final List of Professional Competencies with Median Scores and Interquartile Ranges (IQRs) from Round 3

	Round 3	
Professional Competency	*Mdn*	IQR
Database searching skills	5	0
Oral and written communication skills	5	0.5
Understanding of data organization, including the Medical Subject Headings (MeSH)	5	0.5
Commitment to life-long learning, both knowledge and skill development	5	1
Interpersonal skills	5	1
Ability to match health information needs with available information resources	4.5	1
Basic reference skills, including interviewing, retrieval, and evaluation	4.5	1
Medical literature searching skills	4.5	1
Understanding of the importance of immediacy in health care and ability to react quickly	4.5	1
Analytical skills	4	0
Familiarity with research methods and design	4	0
Knowledge about health sciences librarianship	4	0
Strong knowledge of the health sciences literature, including print and electronic resources	4	0
Teaching and instructional design skills, including knowledge of pedagogy	4	0
Ability to innovate	4	0.5
Ability to work under pressure	4	0.5
Basic information management skills	4	0.5
Commitment to being a librarian	4	0.5
Competence with functional and theoretical application of citation management tools	4	0.5
Dedication	4	0.5
Knowledge about health sciences environment and trends	4	0.5
Project management skills	4	0.5
Resilience in attitude toward receiving feedback and expecting that most innovation faces initial resistance	4	0.5
Understanding of database design and management	4	0.5
Ability to build Web documents, including blogs, libguides, and other non-programming interfaces	4	1
Ability to evaluate the various users in a health setting	4	1
Competence and skill in team-based collaborative activities	4	1
Familiarity with Web design and usage	4	1
Knowledge and competence in social and cultural diversity	4	1
Proficiency with and interest in current and emerging information technologies	4	1
Understanding of basic descriptive and inferential statistics	4	1
Understanding of evidence-based medicine	4	1
Understanding of information needs in the health sciences	4	1
Understanding of subject headings and metadata tags used in health care	4	1
Vision	4	1
Ability to recognize that academic health sciences librarianship requires more than 9-5 M-F commitment	3.5	1
Advanced computer skills	3.5	1
Ability to apply theory	3	0
Ability to critically assess clinical research articles	3	0

(*table continues*)

Table 20 (*continued*).

Professional Competency	Round 3	
	Mdn	IQR
Knowledge and competence in library acquisition, including preparation to adapt to local purchasing conventions	3	0.5
Knowledge of the American Library Association (ALA) Code of Ethics	3	0.5
Strong knowledge of US health care education, especially the Accreditation Council for Graduate Medical Education (ACGME) core competencies	3	0.5
Theoretical and practical understanding of RSS, both for tracking emerging knowledge and building self-updating web pages	3	0.5

Research Question 6

The sixth research question was "What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?" The LIS adjunct faculty/academic health sciences librarianship practitioners identified a total of 79 personal competencies in Round 1 of the study, which were then analyzed and condensed to 65 personal competencies. The 65 personal competencies were rated on a scale from 5 to 1 in Round 2 and re-rated on the same scale in Round 3. At the end of Round 3, there were a total of 63 personal competencies after items with a median score of 2 or less and/or an IQR greater than 1 were eliminated. Of the 63 competencies, five (7.9%) had a median score of 5 – *critically important*, four (6.3%) had a median score of 4.5, 43 (68.3%) had a median score of 4 – *very important*, four (6.3%) had a median score of 3.5, and seven (11.1%) had a median score of 3 – *important*. Table 21 presents the final list of the LIS adjunct faculty/health sciences librarianship practitioners' final list of personal competencies.

Table 21

LIS Adjunct Faculty/Health Sciences Librarianship Practitioners' Final List of Personal Competencies with Median Scores and Interquartile Ranges (IQRs) from Round 3

	Round 3	
Personal Competency	*Mdn*	IQR
Ethical	5	0
Self-motivated	5	0
Understands and honors confidentiality	5	0
Basic reference skills	5	1
Self-learner	5	1
Ability to adapt to change	4.5	1
Ability to work with others in a collegial and professional manner	4.5	1
Continuous learner; is able to keep up with changing environment	4.5	1
Flexibility	4.5	1
Ability to identify and evaluate possible solutions to problems/barriers	4	0
Ability to take risks	4	0
Creativity	4	0
Enthusiasm for new information technologies	4	0
Positive	4	0
Professional attitude	4	0
Seeks opportunities to be involved	4	0
Strong sense of own integrity	4	0
Time management skills	4	0
Ability to deal with fluid boundaries of field-- not set in what libraries or librarians do	4	0.5
Ability to work independently, requesting appropriate input/guidance when needed	4	0.5
Analytical	4	0.5
Application of knowledge	4	0.5
Appreciation of various cultural/professional contexts	4	0.5
Attention to detail	4	0.5
Communicator	4	0.5
Community-centered; genuinely desires consensus and harmony	4	0.5
Curiosity	4	0.5
Emotional intelligence	4	0.5
Innovator	4	0.5
Intelligent	4	0.5
Interest in working in interprofessional teams	4	0.5
Interested in other people	4	0.5
Knowledge of important databases, such as CINAHL	4	0.5
Organized	4	0.5
Outreach skills	4	0.5
Proactive	4	0.5
Pursues a work/life balance that is sustainable	4	0.5
Self-confident	4	0.5
Ability to improve services	4	1
Collaborative orientation	4	1
Commitment to ongoing professional development	4	1
Commitment to serve	4	1
Communication skills	4	1
Humility; ability to be wrong and admit it	4	1

(*table continues*)

Table 21 (*continued*).

Personal Competency	Round 3	
	Mdn	IQR
Knowledge of medical terminology, such as MeSH	4	1
Leadership skills	4	1
Personality	4	1
Respect	4	1
Searching skills for Medline in any format	4	1
Seeks positive solutions	4	1
Teaching skills	4	1
Team player	4	1
Course development skills	3.5	1
Loyalty	3.5	1
Self-aware	3.5	1
Social vision; looks right at customers and colleagues	3.5	1
Repays debts of gratitude in a variety of ways	3	0.5
Understanding of American Library Association Code of Ethics	3	0.5
Background in the sciences	3	1
Basic technical service skills	3	1
Doggedness; never gives up	3	1
Fiscally aware	3	1
Generosity	3	1

Research Question 7

The seventh research question was "How do the professional competencies needed of entry-level academic health sciences librarians compare and contrast among the three groups: (a) academic health sciences library directors; (b) library and information sciences educators who specialize in educating health sciences librarians; and (c) library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?"

The final lists of professional competencies were reviewed to determine areas of commonality among the three panels of experts. There were nine common areas among the three lists, which are outlined in Table 22.

Table 22

Professional Competency Areas Common to the Three Panels of Experts

Common Professional Competency Areas	Panel	*Mdn*	IQR
Communication			
Written, oral, and web-based communication skills	Dir	4	1
Strong oral and written communication skills	Edu	5	0.5
Oral and written communication skills	Adj	5	0.5
Health sciences environment			
Knowledge of issues and trends in health sciences environment	Dir	3	1
Understanding of the current health care environment	Edu	5	1
Knowledge about health sciences environment and trends	Adj	4	0.5
Information organization			
Understanding of the organizational scheme of library resources	Dir	3	1
Understanding of the principles of data, information & knowledge organization	Edu	4	1
Understanding of data organization, including the Medical Subject Headings (MeSH)	Adj	5	0.5
Interpersonal			
Excellent interpersonal skills	Dir	5	1
Strong interpersonal skills, both with clients and staff	Edu	5	0
Interpersonal skills	Adj	5	1
Team player			
Ability to work as a team player	Dir	5	0
Willingness to be a team player or collaborator	Edu	5	0
Competence and skill in team-based collaborative activities	Adj	4	1
Teaching/instruction			
Ability to effectively teach library users	Dir	4	0
Instructional skills	Edu	4	1
Teaching and instructional design skills, including knowledge of pedagogy	Adj	4	0
Technology			
Knowledge of and use of current, new, and emerging technologies having an impact on services/resources	Dir	4	0
Understanding of current telecommunications and information technologies	Edu	4	0.5
Proficiency with and interest in current and emerging information technologies	Adj	4	1
User information needs/behavior			
Understanding of user information seeking behaviors	Dir	4	0
Knowledge of the information needs of health care professionals	Edu	5	0
Understanding of information needs in the health sciences	Adj	4	1

(*table continues*)

Table 22 (continued).

Common Professional Competency Areas	Panel	*Mdn*	IQR
Web creation/design			
Knowledge of Web design principles	Dir	4	1
Web site creation skills	Edu	3	0
Familiarity with Web design and usage	Adj	4	1

Using the Kruskal-Wallis test with an alpha level of .05, the three panels of experts' ratings for the common professional competencies were examined to see if there was significant difference among the panels' ratings. There was no statistically significant difference in the three panels' ratings of seven areas of professional competencies. However, there was a statistically significant difference in the three panels' ratings of the information organization competencies (χ^2 =10.419, *df* = 2, *p* =.005) with mean ranks of 9.36 for the academic health sciences library directors, 13.75 for the LIS educators, and 20.63 for the LIS adjunct faculty/health sciences librarianship practitioners. In addition, there was a statistically significant difference in the three panels' ratings of the health sciences environment competencies (χ^2 =8.040, *df* = 2, *p* = .018) with mean ranks of 9.64 for the academic health sciences library directors, 19.44 for the LIS educators, and 14.56 for the adjunct faculty/health sciences librarianship practitioners.

The final lists of professional competencies were also examined to see if there were common areas between pairs of panels. Between the academic health sciences library directors and the LIS educators specializing in health sciences librarianship education, there were 10 common professional competency areas, outlined in Table 23.

Table 23

Professional Competency Areas Common to the Academic Health Sciences Library Directors and LIS Educators

Common Professional Competency Areas	Panel	*Mdn*	IQR
Creativity			
Creativity	Dir	4	0
Creativity	Edu	5	1
Database Structure			
Knowledge of database structure	Dir	4	1
Understanding of the structure of complex bibliographic databases	Edu	4	1
Ethics			
Knowledge of ethical issues	Dir	4	0
Professional integrity and ethics	Edu	5	0.5
Informatics			
Knowledge and appreciation of medical informatics principles and best practices	Dir	3	0
Understanding of informatics, both academic and applied	Edu	3.5	1
Management			
Understanding of basic management and leadership principles	Dir	3	0
Basic understanding of management principles	Edu	3	1
Medical terminology			
Knowledge of medical terminology	Dir	3	1
Knowledge of medical terminology	Edu	5	1
Networking			
Networking skills	Dir	5	1
Ability to network with other health care librarians	Edu	5	1
Problem-solving			
Problem-solving and analytical skills	Dir	5	1
Problem-solving skills	Edu	5	0
Research			
Ability to conduct research in librarianship	Dir	3	1
Ability to plan, execute, and publish results from a simple scholarly research project	Edu	4	1
Scholarly publishing			
Awareness of current issues in scholarly publishing	Dir	3	0
Understanding of the scholarly publishing process	Edu	4	0

Using the Mann-Whitney *U* test with an alpha level of .05, the ratings of

academic health sciences library directors and LIS educators for the common

professional competencies were examined to see if there was a significant difference

between the two panels' ratings. There was no statistically significant difference in the

ratings for five professional competency areas including creativity, informatics, management, networking, and problem-solving. However, there was a statistically significant difference between the academic health sciences library directors' and the LIS educators' ratings of five professional competency areas, including database structure (*U* = 73.0, *z* = 2.39, *p*=.016); ethics (*U* = 74.0, *z* = 2.48, *p*=.013); medical terminology (*U* = 74.0, *z* = 2.48, *p*=.013); research (*U* = 81.0, *z* = 3.06, *p*=.001); and scholarly publishing (*U* = 76.0, *z* = 2.64, *p*=.008).

Between the academic health sciences library directors and LIS adjunct faculty/health sciences librarianship practitioners, there were eight common professional competency areas, outlined in Table 24.

Table 24

Professional Competency Areas Common to the Academic Health Sciences Library Directors and LIS Adjunct Faculty/Health Sciences Librarianship Practitioners

Common Professional Competency Areas	Panel	*Mdn*	IQR
Analytical			
Problem-solving and analytical skills	Dir	5	1
Analytical skills	Adj	4	0
Computer			
Strong computer and technical skills	Dir	4	1
Advanced computer skills	Adj	3.5	1
Database searching			
Knowledge of database searching basics	Dir	4	0
Database searching skills	Adj	5	0
Literature searching			
Literature searching skills	Dir	4	1
Medical literature searching skills	Adj	4.5	1
Metadata			
Knowledge of cataloging and metadata	Dir	3	0
Understanding of subject headings and metadata tags used in health care	Adj	4	1

(*table continues*)

Table 24 (*continued*).

Common Professional Competency Areas	Panel	*Mdn*	IQR
Project management			
Project management skills	Dir	4	1
Project management skills	Adj	4	0.5
Reference			
Reference interview skills	Dir	4	1
Basic reference skills, including interviewing, retrieval, and evaluation	Adj	4	0.5
Research methods			
Understanding of research methods	Dir	3	1
Familiarity with research methods and design	Adj	4	0

Using the Mann-Whitney *U* test with an alpha level of .05, the ratings of academic health sciences library directors and LIS adjunct faculty/health sciences librarianship practitioners for the common professional competencies were examined to see if there was a significant difference between the two panels' ratings. There was no statistically significant difference in the ratings for three competency areas, including literature searching, project management, and reference. However, there was a statistically significant difference between the academic health sciences library directors' and the LIS adjunct faculty/health sciences librarianship practitioners' ratings of five competency areas, including analytical (U = 68.5, z = 2.02, p = .049); computer (U = 70.5, z = 2.19, p = .026); database searching (U = 75.5, z = 2.60, p = .007); metadata (U = 78.5, z = 2.84, p = .003); and research methods (U = 73.0, z = 2.39, p = .016).

Between the LIS educators specializing in health sciences librarianship education and LIS adjunct faculty/health sciences librarianship practitioners, there were three common professional competency areas, outlined in Table 25.

Table 25

Professional Competency Areas Common to the LIS Educators and LIS Adjunct Faculty/Health Sciences Librarianship Practitioners

Common Professional Competency Areas	Panel	*Mdn*	IQR
Acquisition			
Knowledge of serials acquisition and management	Edu	4	1
Knowledge and competence in library acquisition, including preparation to adapt to local purchasing conventions	Adj	3	0.5
Evidence-based medicine			
Understanding of evidence-based medicine	Edu	4	1
Understanding of evidence-based medicine	Adj	4	1
Lifelong learning			
Lifelong learning skills	Edu	5	0
Commitment to life-long learning, both knowledge and skill development	Adj	5	1

Using the Mann-Whitney *U* test with an alpha level of .05, the ratings of LIS educators and LIS adjunct faculty/health sciences librarianship practitioners for the common professional competencies were examined to see if there was a significant difference between the two panels' ratings. There was no statistically significant difference in the ratings for the acquisition, evidence-based medicine, and lifelong learning competency areas.

Research Question 8

The eighth research question was "How do the personal competencies needed of entry-level academic health sciences librarians compare and contrast among the three groups: (a) academic health sciences library directors; (b) library and information sciences educators who specialize in educating health sciences librarians; and (c) library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?"

The final lists of personal competencies were reviewed to determine areas of commonality among the three panels of experts. There were ten common areas among the three lists, which are outlined in Table 26.

Table 26

Personal Competency Areas Common to the Three Panels of Experts

Common Personal Competency Areas	Panel	*Mdn*	IQR
Analytical			
Analytic or problem-solving skills	Dir	5	1
Analytical ability	Edu	4.5	1
Analytical	Adj	4	0.5
Change			
Ability to cope with change	Dir	5	0
Ability to embrace and adapt to change	Edu	5	0
Ability to adapt to change	Adj	4.5	1
Communication			
Strong communication skills, both written and verbal	Dir	5	0
Ability to communicate effectively	Edu	5	0
Communication skills	Adj	4	1
Creativity			
Creativity	Dir	4	1
Creativity	Edu	4	1
Creativity	Adj	4	0
Curiosity			
Intellectual curiosity	Dir	5	0
Curiosity	Edu	5	0.5
Curiosity	Adj	4	0.5
Ethical			
Ethical values	Dir	5	0
Belief in ethical professional practice	Edu	5	0
Ethical	Adj	5	0
Flexibility			
Flexibility	Dir	5	0
Flexibility	Edu	5	0
Flexibility	Adj	4.5	1
Integrity			
Integrity	Dir	5	0
Personal integrity	Edu	5	0
Strong sense of own integrity	Adj	4	0

(*table continues*)

Table 26 (*continued*).

Common Personal Competency Areas	Panel	*Mdn*	IQR
Self-motivated			
Self-motivated	Dir	5	0
Self-motivated	Edu	5	0
Self-motivated	Adj	5	0
Team player			
Team player	Dir	5	0
Team player	Edu	5	0
Team player	Adj	4	1

Using the Kruskal-Wallis test with an alpha level of .05, the three panels of experts' ratings for the 10 areas of commonality were examined to see if there was significant difference among the panel ratings. There was no statistically significant difference in the three panels' ratings of eight of the areas of commonality. However, there was a statistically significant difference in the three panels' ratings of the curiosity competencies (χ^2 =11.867, *df* = 2, *p* = .003) with mean ranks of 17.91 for the academic health sciences library directors, 15.38 for the LIS educators, and 7.25 for the LIS adjunct faculty/health sciences librarianship practitioners. In addition, there was a statistically significant difference in the three panels' ratings of the integrity competencies (χ^2 = 21.375, *df* = 2, *p* = .000) with mean ranks of 17.50 for the academic health sciences library directors, 17.50 for the LIS educators, and 5.69 for the adjunct faculty/health sciences librarianship practitioners.

The final lists of personal competencies were also examined to see if there were common areas between pairs of panels. Between the academic health sciences library directors and the LIS educators specializing in health sciences librarianship education, there were nine common personal competency areas of commonality, outlined in Table 27.

Table 27

Personal Competency Areas Common to the Academic Health Sciences Library Directors and LIS Educators

Common Personal Competency Areas	Panel	Mdn	IQR
Big picture			
Ability to see the big picture as well as the little details	Dir	4	0
Ability to see the big picture	Edu	5	1
Desire to help			
Desire to help	Dir	4	1
Desire to assist others	Edu	5	0
Diversity			
Appreciation of diversity	Dir	4	1
Embrace and encourage diversity	Edu	4.5	0
Enthusiasm			
Enthusiasm	Dir	4	1
Enthusiasm	Edu	5	0.5
Initiative			
Initiative	Dir	5	0
Initiative	Edu	5	0.5
Interpersonal			
Strong interpersonal skills	Dir	5	0
Interpersonal skills	Edu	5	0
Lifelong learning			
Interest in lifelong learning and professional development	Dir	5	1
Strong motivation for lifelong learning	Edu	5	0
Professional passion			
Passion and enthusiasm for the profession	Dir	5	0
Professional passion	Edu	5	1
Vision			
Vision	Dir	4	1
Eye for vision and mission	Edu	4	0

Using the Mann-Whitney *U* test with an alpha level of .05, the ratings of academic health sciences library directors and LIS educators for the common personal competencies were examined to see if there was a significant difference between the two panels' ratings. There was no statistically significant difference in the ratings for eight personal competency areas; however, there was a statistically significant difference between the academic health sciences library directors' and the LIS

educators' ratings of competencies related to the ability to see the big picture (U = 70.5,

z = 2.19, p =.026).

Between the academic health sciences library directors and LIS adjunct

faculty/health sciences librarianship practitioners, there were 14 common personal

competency areas, outlined in Table 28.

Table 28

*Personal Competency Areas Common to the Academic Health Sciences Library
Directors and LIS Adjunct Faculty/Health Sciences Librarianship Practitioners*

Common Personal Competency Areas	Panel	*Mdn*	IQR
Attention to detail			
Pays attention to details	Dir	4	0
Attention to detail	Adj	4	0.5
Collegiality			
Collegiality	Dir	4	1
Ability to work with others in a collegial and professional manner	Adj	4.5	1
Confidentiality			
Respect for confidentiality	Dir	5	0
Understands and honors confidentiality	Adj	5	0
Generosity			
Generous in spirit	Dir	4	1
Generosity	Adj	3	1
Innovative			
Innovative	Dir	4	0
Innovator	Adj	4	0.5
Leadership			
Potential to assume leadership responsibility	Dir	3	0
Leadership skills	Adj	4	1
Organized			
Organized	Dir	4	1
Organized	Adj	4	0.5

(*table continues*)

Table 28 (*continued*).

Common Personal Competency Areas	Panel	*Mdn*	IQR
Positive			
Positive attitude	Dir	5	0
Positive	Adj	4	0
Professional development			
Interest in lifelong learning and professional development	Dir	5	1
Commitment to ongoing professional development	Adj	4	1
Respect			
Respect for others	Dir	5	0
Respect	Adj	4	1
Risks			
Ability to take risks	Dir	4	1
Ability to take risks	Adj	4	0
Self-confident			
Self-confidence	Dir	4	0
Self-confident	Adj	4	0.5
Self-learner			
Ability to learn independently	Dir	5	0
Self-learner	Adj	5	1
Teaching			
Effective teaching skills	Dir	4	0
Teaching skills	Adj	4	1

Using the Mann-Whitney *U* test with an alpha level of .05, the ratings of academic health sciences library directors and LIS adjunct faculty/health sciences librarianship practitioners for the common personal competencies were examined to see if there was a significant difference between the two panels' ratings. There was no statistically significant difference in the ratings for 13 personal competency areas. However, there was a statistically significant difference between the academic health sciences library directors' and the LIS adjunct faculty/health sciences librarianship practitioners' ratings of the positive (*U* = 74.5, *z* = 2.52, *p* =.009) competencies.

Between the LIS educators specializing in health sciences librarianship education and LIS adjunct faculty/health sciences librarianship practitioners, there were five common personal competency areas, outlined in Table 29.

Table 29

Personal Competency Areas Common to the LIS Educators and LIS Adjunct Faculty/Health Sciences Librarianship Practitioners

Common Personal Competency Areas	Panel	*Mdn*	IQR
Collaborative			
Collaborative	Edu	5	0.5
Collaborative orientation	Adj	4	1
Emotional intelligence			
Emotional intelligence	Edu	4.5	1
Emotional intelligence	Adj	4	0.5
Intelligence			
Intelligence	Edu	5	0.5
Intelligent	Adj	4	0.5
Interest in people			
General interest in people	Edu	5	0
Interested in other people	Adj	4	0.5
Time management			
Efficient time management	Edu	5	0
Time management skills	Adj	4	0

Using the Mann-Whitney U test with an alpha level of .05, the ratings of LIS educators and LIS adjunct faculty/health sciences librarianship practitioners for the common personal competencies were examined to see if there was a significant difference between the two panels' ratings. There was no statistically significant difference in the ratings for three competency areas, including collaborative, emotional intelligence, and intelligence competencies. However, there was a statistically significant difference in two competency areas, including interest in people ($U = 57.0$, $z = 2.63$, $p = .006$) and time management ($U = 56.5$, $z = 2.57$, $p = .007$).

Summary

This chapter presented the analysis and findings of the data collected from four rounds of the Delphi Method. Overall, the three panels of experts chose the LIS educators' final lists of professional and personal competencies as the preferred competencies of the three lists that were developed.

The three panels of experts exhibited some commonality in their lists of professional and personal competencies, but there were some statistically significant differences in how they rated particular competencies. Among all three panels of experts, two professional competency areas (health sciences environment and information organization) and two personal competency areas (curiosity and integrity) were rated differently by the members of each panel.

Although the academic health sciences library directors and LIS educators had 10 professional competency areas in common, they rated half (50% or 5) of those areas differently, including database structure, ethics, medical terminology, research, and scholarly publishing. The academic health sciences library directors and LIS adjunct faculty/health sciences librarianship practitioners selected 8 professional competency areas in common, but they rated over half (62.5% or 5) differently, including analytical, computer, database searching, metadata, and research methods. The LIS educators and LIS adjunct faculty/health sciences librarianship practitioners named three professional competency areas in common, but none of them were rated differently.

In terms of personal competency areas, the academic health sciences library directors and LIS educators identified 9 areas in common, but only one (ability to see the big picture) had significantly different ratings. The academic health sciences library

directors and LIS adjunct faculty/health sciences library directors chose 14 personal

competency areas in common, but only one (positive competency area) had statistically

significant differences in ratings. The LIS educators and LIS adjunct faculty/health

sciences librarianship practitioners demonstrated five personal competency areas in

common, but two of those five (interest in people and time management) were rated

significantly different by the two panels.

The next chapter provides an overview of the study and conclusions. In addition,

the significance of the study and recommendations for future research are discussed.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter presents an overview of the study along with the findings as they relate to the research questions and literature and conclusions drawn from the study. In addition, the significance of the study and the recommendations for future research are discussed.

Overview of the Study

The purpose of this study was to identify the professional and personal competencies that entry-level academic health sciences librarians should possess from the perspectives of academic health sciences library directors, library and information sciences (LIS) educators who specialize in educating health sciences librarians, and individuals who serve as both LIS adjunct faculty and practitioners in the field of health sciences librarianship. For the purposes of this study, professional competencies were defined as the knowledge and skills necessary for successful job performance (Spencer and Spencer, 1993; Fisher, 2001), and personal competencies were defined as the individual motives, traits, and self-concepts necessary for successful job performance (Spencer and Spencer, 1993; Fisher, 2001) (see Chapter I for more definitions of terms used in the study). Using the iceberg model developed by Spencer and Spencer (1993) as the theoretical framework, four rounds of the Delphi method were used to address the research questions. The first six research questions focused on this identification of professional and personal competencies, and the last two research questions focused on comparing and contrasting the three perspectives on the professional and personal

competencies. Three panels of experts, initially composed of 13 academic health sciences library directors, 8 LIS educators, and 8 LIS adjunct faculty adjunct faculty/health sciences librarianship practitioners, participated in the study, and most participants were female, white, in the age range of 45-64, had less than 20 years of experience in their respective careers, and were members of the Medical Library Association. By Round 4, the participants were as follows: 11 academic health sciences library directors, 7 LIS educators, and 8 LIS adjunct faculty/health sciences library practitioners. Each panel's perspectives on the professional and personal competencies that academic health sciences librarians should possess for entry-level positions were also compared and contrasted. The data collected from the rounds of the Delphi method were analyzed using descriptive statistics, including measures of central tendency, and non-parametric statistics, including the Kruskal-Wallis and Mann-Whitney *U* tests.

Findings in Relation to the Research Questions

This section is structured in relation to the perspectives of the three panels of experts on the professional and personal competencies needed of entry-level academic health sciences librarians, which are the focus of the eight research questions that guided the study.

Academic Health Sciences Library Directors

Research Question 1

The first research question was: "What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of academic health sciences library directors?" After three rounds of the Delphi study, the

academic health sciences library directors reached consensus on a total of 78

professional competencies (see Chapter IV, Table 16). Of the 78 professional

competencies, 7 (9.0%) had a median score of 5 – *critically important* and an

interquartile range (IQR) of 0, indicating high levels of importance and agreement on

these items. Upon analysis of the 7 competencies, the directors emphasized the

importance of teamwork and learning.

Research Question 2

The second research question was: "What are the personal competencies

needed of entry-level academic health sciences librarians from the perspective of

academic health sciences library directors?" After three rounds of the Delphi study, the

academic health sciences library directors reached consensus on a total of 91 personal

competencies (see Chapter IV, Table 17). Of the 91 personal competencies, 27 (29.7%)

had a median score of 5 – *critically important* and an IQR of 0, indicating a high level of

consensus on these items. Upon analysis of the 27 competencies, the directors

emphasized the importance of teamwork, learning, integrity, motivation, flexibility, and

communication.

Observations

Out of the three panels of experts, the academic health sciences library directors'

final lists provided the most number of professional and personal competencies, which

is not surprising as they were the largest group in the study. In addition, the directors

rated more personal competencies as critically important compared to professional

competencies. Of the 13 professional and 34 personal competencies identified by the

directors and rated with a median score of 5 – *critically important* and an IQR of 1 or

less, there were seven overlapping areas, including being able to work in teams, being a team player, flexibility, interpersonal skills, open-mindedness, problem-solving skills, and willingness to learn. Looking closely at these competencies, they are personal in nature, which implies that the directors perceive these competencies as being important to professional work. Of all the panels of experts, the directors exhibited the most overlap between critically important professional and personal competencies.

In terms of consensus on the professional and personal competencies, the directors reached consensus on 84.1% (74 out of 88) of the professional competencies and 79.8% (75 out of 94) of the personal competencies in Round 2. The percentage of consensus for the professional and personal competencies increased in Round 3 to 96.6% (85 out of 88) and 97.9% (92 out of 94) respectively. The directors had the highest consensus percentages out of the three panels of experts, which indicated they shared the most similar viewpoints on the competencies.

The directors were the only panel of experts to have rated any competencies as 2 – *not very important*, and seven professional competencies received this rating, including ability to write a basic grant application, financial literacy skills, knowledge and ability to do data mining, knowledge of budgeting, knowledge of the history of librarianship, science or clinical background, and understanding of the historical context for libraries. Looking closely at these competencies, the directors did not perceive knowledge of finance and budgeting or history as important competencies for entry-level academic health sciences librarians. Though they did not find a science or clinical background as not very important, they did find knowledge of the health sciences subject matter important.

In addition, the directors did not reach consensus on three professional competencies, including knowledge of health sciences information resources and services; basic understanding of the 5-step process of evidence-based librarianship; and understanding and application of library management. Although the directors did not reach consensus on the understanding and application of library management, they did come to consensus on a similar competency – understanding of basic management and leadership principles.

The directors rated one personal competency, basic supervision skills, as 2 – *not very important*. Also, they did not reach consensus about two personal competencies, the ability to determine the most efficient way to solve problems and stamina.

LIS Educators Specializing in Health Sciences Librarianship Education

Research Question 3

The third research question was: "What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences educators that specialize in educating health sciences librarians?" After three rounds of the Delphi study, the LIS educators reached consensus on a total of 60 professional competencies (see Chapter IV, Table 18). Of the 60 professional competencies, 12 (20.0%) had a median score of 5 – *critically important* and an IQR of 0, indicating high levels of importance and agreement on these items. Upon analysis of these 12 professional competencies, the LIS educators emphasized the importance of learning, knowledge of health care professionals, information retrieval and searching, professionalism, interpersonal, and teamwork.

Research Question 4

The fourth research question was: "What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences educators that specialize in educating health sciences librarians?" After three rounds of the Delphi study, the LIS educators reached consensus on a total of 50 personal competencies (see Chapter IV, Table 19). Of the 50 personal competencies, 15 (30.0%) had a median score of 5 – *critically important* and an IQR of 0, indicating high levels of importance and agreement on these items. Upon analysis of these 15 professional competencies, the LIS educators emphasized the importance of communication, integrity, teamwork, interpersonal, and motivation.

Observations

The LIS educators' final list of professional competencies included more items than the LIS adjunct faculty/health sciences librarianship practitioners, but less than the academic health sciences library directors; however, their final list of personal competencies contained the fewest number of items comparatively. Of the 30 professional and 30 personal competencies identified by the LIS educators and rated with a median score of 5 – *critically important* and an IQR of 1 or less, there were six overlapping areas, including being a team player, communication skills, curiosity, interpersonal skills, lifelong learning, and professional ethics. Looking closely at these competencies, they are personal in nature, which implies that the LIS educators, like the directors, perceive these competencies as being important to professional work.

In terms of consensus on the professional and personal competencies, the LIS educators reached consensus on 58.5% (38 out of 65) of the professional competencies

and 68.4% (39 out of 57) of the personal competencies in Round 2, the lowest of the three panels of experts. The percentage of consensus for the professional and personal competencies increased substantially in Round 3 to 92.3% (60 out of 65) and 87.7% (50 out of 57) respectively. Actually, the LIS educators demonstrated the lowest percentage of consensus on the personal competencies of all the panels.

The LIS educators did not reach consensus on five professional competencies and seven personal competencies in Round 2. The five professional competencies include the ability to advocate; ability to network with administrators; knowledge of data mining; marketing research and application skills; and understanding of advanced knowledge management systems. After careful review of these competencies, they tend to be advanced for an entry-level position, which could explain why the educators did not reach consensus on these items.

The LIS educators did not reach consensus on seven personal competencies: assertiveness, commitment to evidence-based practice, confidence, friendliness, political intelligence, sense of humor, and willingness to take creative risks. With the exception of evidence-based practice and political intelligence, the remaining competencies could be considered both an asset and a liability in the work environment.

LIS Adjuncts/Health Sciences Librarianship Practitioners

Research Question 5

The fifth research question was: "What are the professional competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?" After three rounds of the Delphi study, the LIS adjunct faculty/ health

sciences librarianship practitioners reached consensus on a total of 43 professional competencies (see Chapter IV, Table 20). Of the 43 professional competencies, only 1 (2.3%) had a median score of 5 – *critically important* and an IQR of 0, indicating high levels of importance and agreement, and it was database searching skills.

Research Question 6

The sixth research question was: "What are the personal competencies needed of entry-level academic health sciences librarians from the perspective of library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?" After three rounds of the Delphi study, the LIS adjunct faculty/ health sciences librarianship practitioners reached consensus on a total of 63 personal competencies (see Chapter IV, Table 21). Of the 63 personal competencies, 3 (4.8%) had a median score of 5 – *critically important* and an IQR of 0, indicating high levels of importance and agreement, and they were ethical, self-motivated, and understands and honors confidentiality.

Observations

The LIS adjunct faculty/health sciences librarianship practitioners' final list of professional competencies included the fewest number of items; however, their final list of personal competencies contained more items than that of the LIS educators, but fewer than the academic health sciences library directors. Of the 5 professional and 5 personal competencies identified with a median score of 5 – *critically important* and an IQR of 1 or less, there were no overlapping areas. The low number of professional and personal competencies receiving a 5 – *critically important* from the LIS adjuncts/health sciences librarianship practitioners could explain the lack of overlapping areas.

In terms of consensus on the professional and personal competencies, the LIS adjunct faculty/health sciences librarianship practitioners reached consensus on 75.0% (36 out of 48) of the professional competencies and 63.1% (41 out of 65) of the personal competencies in Round 2, which was lower than the academic health sciences library directors but higher than the LIS educators. The percentage of consensus for the professional and personal competencies increased in Round 3 to 89.6% (43 out of 48) and 96.9% (63 out of 65) respectively. In addition, the LIS adjuncts/health sciences librarianship practitioners exhibited the lowest percentage of consensus on the professional competencies of all the panels.

Interestingly, this panel did not reach consensus on two competencies related to customer orientation/service – knowledge of the customer service standards for information professionals in the health care and research enterprise (professional) and service oriented (personal). The LIS adjunct faculty/health sciences librarianship practitioners did not reach consensus on four additional professional competencies: common sense; knowledge of information ethics and health care; mastery of English language competence required in US [United States] academic health sciences campus; and understanding of scholarly communication, including copyright and open access. In addition, like the LIS educators, they did not reach consensus on the personal competency, sense of humor.

Comparing and Contrasting the Panels' Perspectives

Research Question 7

The seventh research question was: "How do the professional competencies needed of entry-level academic health sciences librarians compare and contrast among

the three groups: (a) academic health sciences library directors; (b) library and information sciences educators that specialize in educating health sciences librarians; and (c) library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?" First of all, the LIS educators' final list of professional competencies was preferred by most of the experts on all three panels over the ones developed by the academic health sciences library directors and the LIS adjunct faculty/health sciences librarianship practitioners. Almost all of the experts (23 out of 26 or 88.5%) chose the LIS educators' list of professional competencies. Next, the LIS adjunct faculty/health sciences librarianship practitioners' list received the second most votes, followed by the academic health sciences library directors' list.

In analyzing the final lists of professional competencies, there were 9 professional competency areas common among the three panels of experts, including: (1) communication, (2) health sciences environment, (3) information organization, (4) interpersonal, (5) team player, (6) teaching/instruction, (7) technology, (8) user information needs/behavior, and (9) web creation/design. Notably the competencies listed under the interpersonal area are the only ones that received a median score of 5 – *critically important* from all three panels of experts.

Looking more specifically at the professional competency areas, there were statistically significant differences in the way the three panels of experts rated two common professional competency areas: health sciences environment and information organization. Unlike the academic health sciences library directors and LIS educators, the LIS adjunct faculty/health sciences librarianship practitioners rated their information organization competency as 5 – *critically important*. This is notable because the LIS

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adjunct faculty/health sciences librarianship practitioners rated so few professional competencies as 5 – critically important. In turn, the LIS educators rated their health sciences environment competency as 5 – *critically important*; whereas, the directors and adjunct faculty/practitioners rated their competencies as 3 – *important* and 4 – *very important* respectively. Not surprisingly, the LIS educators place a larger emphasis on the health sciences environment competency as this would be a basic component of a health sciences librarianship course and/or curriculum.

Common professional competency areas existed within three pairs of experts: (1) academic health sciences library directors and LIS educators; (2) academic health sciences library directors and LIS adjunct faculty/health sciences librarianship practitioners; and (3) LIS educators and LIS adjunct faculty/health sciences librarianship practitioners. The first pair, the directors and LIS educators, shared 10 professional competency areas in common, but there were statistically significant differences in how they rated half (5) of the competency areas, including database structure, ethics, medical terminology, research, and scholarly publishing. The second pair, the directors and LIS adjunct faculty/health sciences librarianship practitioners, held 8 professional competency areas in common, but there were statistically significant differences in how they rated over half (5) of the competency areas, including analytical, computer, database searching, metadata, and research methods. The third pair, LIS educators and LIS adjunct faculty/health sciences librarianship practitioners, demonstrated three professional competency areas in common, and there were no statistically significant differences in how they rated those competency areas.

Research Question 8

The eighth research question was: "How do the personal competencies needed of entry-level academic health sciences librarians compare and contrast among the three groups: (a) academic health sciences library directors; (b) library and information sciences educators that specialize in educating health sciences librarians; and (c) library and information sciences adjunct faculty/practitioners in the area of health sciences librarianship?" The LIS educators' final list of personal competencies was preferred by the three panels of experts over the ones developed by the academic health sciences library directors and LIS adjunct faculty/health sciences librarianship practitioners. More than half (14 out of 26 or 53.8%) of the experts chose the LIS educators' list personal competencies. Next, the LIS adjunct faculty/health sciences librarianship practitioners' list received the second most votes, followed by the academic health sciences library directors' list.

In analyzing the final lists of personal competencies, there were 10 personal competency areas common among the three panels of experts, including: (1) analytical, (2) change, (3) communication, (4) creativity, (5) curiosity, (6) ethical, (7) flexibility, (8) integrity, (9) self-motivated, and (10) team player. Notably the competencies listed under the ethical and self-motivated areas are the only ones that received a median score of 5 – *critically important* from all three panels of experts.

Looking more specifically at the personal competency areas, there were statistically significant differences in the way the three panels of experts rated areas: curiosity and integrity. For both curiosity and integrity, the directors and LIS educators

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rated these competencies as 5 – *critically important*, but the LIS adjunct faculty/health sciences practitioners rated them as 4 – *very important*.

Within the three pairs of experts, (1) academic health sciences library directors and LIS educators; (2) academic health sciences library directors and LIS adjunct faculty/health sciences librarianship practitioners; and (3) LIS educators and LIS adjunct faculty/health sciences librarianship practitioners, common personal competency areas existed. The first pair, the directors and LIS educators, shared 9 personal competency areas in common, but there was a statistically significant difference in the way they rated the ability to see the big picture competency area. The second pair, the directors and LIS adjunct faculty/health sciences library practitioners, exhibited 14 professional competency areas in common, but there was a statistically significant difference in the way they rated the positive attitude competency area. The third pair, LIS educators and LIS adjunct faculty/health sciences librarianship practitioners, chose 5 personal competency areas in common, but there was a statistically significant difference in how they rated two of the competency areas, interest in people and time management.

Observations

In terms of the professional and personal competency areas common among all three panels of experts, communication and team player appeared in both lists. The academic health sciences library directors and LIS educators shared the most professional competency areas (10) in common; however, the directors and LIS adjunct faculty/health sciences librarianship practitioners identified the most personal competency areas (14) in common. The LIS educators and LIS adjunct faculty/health

sciences librarianship practitioners exhibited the fewest number of professional and personal competency areas in common, 3 and 5 respectively.

Even though the two pairs, (1) academic health sciences library directors and LIS educators and (2) academic health sciences library directors and LIS adjuncts/health sciences librarianship practitioners, held 10 and 8 professional competency areas in common respectively, there was a lack of consistency in how the pairs rated these areas due to the high numbers of statistically significant differences (5 for both pairs). Among the common personal competency areas, there was much more consistency in the ratings given by the panels of experts due to the relative few numbers of statistically significant differences among the three pairs of experts.

Professional and Personal Competencies in the Context of the Literature

As summarized in Chapter II, the literature review of competency statements and studies in librarianship, health sciences librarianship, and related health fields provided a framework of 21 competencies, and Table 30 shows how the professional and personal competencies developed by the three panels of experts in this study compare to those identified in the literature review.

Table 30

Comparison of the Competencies Identified in the Literature Review with the Competencies Developed by the Three Panels of Experts

Literature Review Competency Areas	Listed by Directors	Listed by Educators	Listed by Adjuncts
1. Administration and management	X	X	
2. Client/user needs	X	X	X
3. Communication	X	X	X
4. Collection management		X	
5. Customer orientation/service	X		
6. Evaluation and assessment	X		

(*table continues*)

Table 30 (*continued*).

Literature Review Competency Areas	Listed by Directors	Listed by Educators	Listed by Adjuncts
7. Evidence-based medicine		X	X
8. Informatics	X	X	
9. Information organization	X	X	X
10. Information sources		X	X
11. Interpersonal relations	X	X	X
12. Leadership	X		X
13. Problem solving/analytical	X	X	X
14. Project management	X		X
15. Reference	X		X
16. Research	X	X	X
17. Searching	X	X	X
18. Subject expertise	X		X
19. Teaching/instruction	X	X	X
20. Teamwork/collaboration	X	X	X
21. Technology	X	X	X

Notably most of the competencies in the literature review are more professional rather than personal in nature, so it is not surprising that only 3 of the 10 (30%) personal competency areas common among the three panels of experts appear in the list developed from the literature review. In comparison, 7 out of 9 (77.8%) professional competency areas common among the three panels of experts appear in the list developed from the literature.

Comparing the three panels' final lists of professional and personal competencies with the competencies identified in the literature review, the directors listed 18 out of 21 (85.7%), the educators listed 15 out of 21 (71.4%), and the adjuncts listed 16 out of 21 (76.2%). This indicates that the academic health sciences library directors' competencies were the most in sync with the competencies development from the literature review.

There are ten gaps between the competencies developed from the literature review and the competencies developed by the three panels of experts. Unlike the

other two panels of experts, the LIS adjunct faculty/health sciences librarianship practitioners did not include an administration/management competency, which indicates that they do not perceive this to be an important competency for entry-level academic health sciences librarians. This is interesting because the LIS adjunct faculty/health sciences librarianship practitioners teach courses in health sciences librarianship, which would tend to have a component on this area.

Collection management was only specifically listed by the LIS educators; however, the LIS adjunct faculty/health sciences librarianship practitioners listed knowledge and competence in library acquisition, which is an aspect of collection management. The academic health sciences library directors did not list collection management as a competency needed for entry-level academic health sciences librarians.

The academic health sciences library directors were the only panel to include a competency related to customer service/orientation. The LIS adjunct faculty/health sciences librarianship practitioners included a professional and a personal competency related to customer service, but interestingly, the adjuncts did not reach consensus on either of these items. Although the LIS educators do not specifically mention customer orientation/service, they did list desire to assist others as one of the personal competencies, indicating a similarity in thought.

Evaluation and assessment is another area in which the academic health sciences library directors included a competency, but the other two panels did not. As administrators, the academic health sciences library directors are keenly aware of the importance of demonstrating the value of library services to their parent institution.

The literature review also indicated a need for academic health sciences librarians to have an understanding of informatics and evidence-based medicine, and the LIS educators were the only panel to include both in their list of professional competencies. On the other hand, the academic health sciences library directors only included an informatics competency, and the LIS adjunct faculty/health sciences librarianship practitioners only included an evidence-based medicine competency. The LIS adjuncts/health sciences library practitioners reported teaching courses in evidence-based medicine, so it is not unexpected that they included this as a competency.

The LIS educators and LIS adjunct faculty/health sciences librarianship practitioners both reported teaching courses related to information sources, so it is not unusual that they would both include this as a competency for entry-level academic health sciences librarians. The academic health sciences library directors included a competency about knowledge of health sciences information resources and services, but they did not reach consensus on this item.

In terms of project management, the academic health sciences directors and LIS adjuncts/health sciences librarianship practitioners indicated that this was an important competency for entry-level academic health sciences librarians. However, the LIS educators did not list this as one of their competencies. Reference was another area that the LIS educators did not specifically mention in their lists of competencies, but they did list basic knowledge of public services, which typically includes reference services.

Due to advances in health sciences, there is a need for more individuals with subject expertise in this area, so it is not surprising that the academic health sciences library directors and LIS adjuncts/health sciences librarianship practitioners included

these as competencies. Despite the fact that the LIS educators did not include this as a competency, they had other competencies that demand subject expertise, such as biostatistics and epidemiology.

Overall, the three panels of experts' competencies were consistent with the findings from the literature review, so it is also important to see how the experts' professional and personal competencies compare to the Medical Library Association's educational policy statement, "Competencies for Lifelong Learning and Professional Success." This educational policy statement provides a framework for the professional development and continuing education activities of MLA.

MLA's educational policy statement is composed of seven professional competencies and a list of personal attributes that contribute to success. The seven professional competencies relate to the areas of the health sciences and health care environment, leadership and management, user needs, information resources, technology, curriculum design and instruction, and research methods. All seven of these professional areas were listed by at least one of panels of experts. More specifically, health sciences environment, user needs, technology, and instruction were professional competencies common to all three panels of experts. The personal attributes listed by MLA were divided into 10 practice-related competencies and 7 personal characteristics. Of these 17 personal attributes, the three panels of experts' only had 8 in common, including effective risk taking; communication and interpersonal skills; ability to work independently and in groups; adaptability and flexibility; balance of personal and professional life; creativity, imagination, and resourcefulness in problem solving; curiosity and commitment to lifelong learning; and leadership skills and

qualities. Though the professional competencies developed by the three panels of experts meshed with ones developed by MLA, there was a remarkable difference in the personal competencies.

Conclusions

There are two major conclusions that can be drawn from the findings of the study.

1. *Personal competencies are as important as professional competencies.*

Although the literature has focused more specifically on professional competencies, this study has demonstrated that personal competencies should not be overlooked in terms of professional practice and educational planning. According to Spencer and Spencer (1993), it is more cost-effective to develop knowledge and skill (professional) competencies through training, so they suggested that individuals should be hired based on their core motive and trait (personal) competencies. Because of this, managers and educators need to find ways to foster personal competencies in their employees and students. Giuse et al. (1997) also found that personality characteristics and skills were highly ranked, and they stated, "Rather than focusing on providing static technical skills, future training programs must give trainees the opportunity to develop the habits of lifelong learning and proactivity" (pp. 62-63).

2. *The professional and personal competencies developed by the LIS educators who specialize in health sciences librarianship education were preferred over the ones developed by the academic health sciences library directors and LIS adjunct faculty/health sciences librarianship practitioners.*

This indicates that the LIS educators are perceived to have the best understanding of both the professional and personal competency needs of entry-level academic health sciences librarians. The LIS educators' professional list reflects the current trends in the field of health sciences librarianship, discussed in Chapter II, including competencies in bioinformatics, evidence-based medicine, and information technology. While the LIS educators' list of professional competencies includes health care and health sciences related competencies, it also includes competencies traditionally associated with librarianship, such as searching, information sources, collection management, and information organization. The LIS educators' final list of personal competencies had the fewest number of items, but judging by the experts' opinion, it was the most relevant for entry-level academic health sciences librarians.

Additional Points

1. The academic health sciences library directors and LIS educators shared the most professional competency areas in common, indicating that they had similar viewpoints in terms of the professional competencies.

2. The academic health sciences library directors and LIS adjunct faculty/health sciences librarianship practitioners held the most personal competency areas in common, indicating that they had similar viewpoints in terms of the personal competencies.

3. The LIS educators and LIS adjuncts/health sciences librarianship practitioners exhibited the fewest number of professional and personal competency areas in common, indicating that they had the least similar viewpoints in terms of the competencies.

4. Throughout the study, there was an overlap between the professional and personal competencies listed by the panels of experts, indicating that the experts may not have a clear understanding of the difference between the two types of competencies.

Significance of the Study

Experts in the field of health sciences librarianship have created a comprehensive inventory of both professional (knowledge and skill) competencies and personal (self-concept, trait, and motive) competencies that can be used in professional practice as well as educational planning.

In professional practice, the competencies could be used for recruitment and selection of staff, identification of staff training needs, the development of continuing education courses, the writing of job descriptions and interview questions, and the evaluation of employee performance.

In educational planning, the competencies could be used for recruitment and selection of students, curriculum development and revision, and the career pathing of students. While the focus of education for health sciences librarians has centerd on professional competencies, the results of this study demonstrate the potential to impact the way personal competencies are addressed in the curriculum.

Professional associations, such as the Medical Library Association, may also use these professional and personal competencies to develop future educational policy statements.

Recommendations for Future Research

Based on the findings of this study, there are several recommended future areas of research. The perspectives of entry-level academic health sciences librarians themselves and their direct supervisors regarding the professional and personal competencies merit further study. The present study could be replicated for other entry-level positions in health sciences librarianship, such as in hospital settings, to compare and contrast with the findings of this study. This methodology could be utilized for other levels of academic health sciences librarians, such as mid-level managers or directors to explore whether there are differences in professional and personal competencies depending on position level. In addition, other specialized areas of librarianship such as corporate or special could apply this methodology.

Because personal competencies were identified to be important in this study, more research about how to cultivate these competencies in educational and professional settings should be conducted. More specifically, as more master's degree courses and professional development opportunities move to the online environment, it would be important to study how personal competencies can be developed and enhanced in this modality. Additionally, more research should be conducted on the role that professional associations, such as the Medical Library Association, play in assisting their membership in enhancing their personal competencies.

Summary

This chapter presented an overview of the study and the findings in relation to the research questions and literature. The two major conclusions of the study were

discussed along with the significance of the study in terms of professional practice and

educational planning. In addition, recommendations for future research were provided.

APPENDIX A

APPROVAL LETTER FROM THE INSTITUTIONAL REVIEW BOARD

UNT™
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May 4, 2009

Jodi Philbrick
Department of Library and Information Sciences
University of North Texas

Re: Human Subjects Application No. 09193
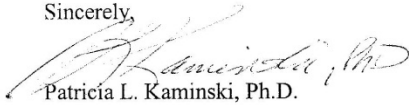
Dear Ms. Philbrick:

As permitted by federal law and regulations governing the use of human subjects in research projects (45 CFR 46), the UNT Institutional Review Board has reviewed your proposed project titled "A Study of the Competencies Needed of Entry-level Academic Health Sciences Librarians." The risks inherent in this research are minimal, and the potential benefits to the subject outweigh those risks. The submitted protocol is hereby approved for the use of human subjects in this study. **Federal Policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only, May 4, 2009 to May 3, 2010.**

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. The IRB must also review this project prior to any modifications.

Please contact Shelia Bourns, Research Compliance Administrator, or Boyd Herndon, Director of Research Compliance, at extension 3940, if you wish to make changes or need additional information.

Sincerely,

Patricia L. Kaminski, Ph.D.
Associate Professor
Chair, Institutional Review Board

PK:sb

CC: Dr. Ana Cleveland

APPENDIX B

ROUND 1 – ELECTRONIC MAIL MESSAGE TO EXPERTS

Subject: Invitation to Research Study: Competencies of Entry-Level Academic Health Sciences Librarians

Dear {INSERT NAME},

My name is Jodi Philbrick, and I am a doctoral candidate in the Interdisciplinary Ph.D. Program in Information Science at the University of North Texas. My faculty advisor is Dr. Ana D. Cleveland.

I would like to invite you to participate in a Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians." A Delphi study engages experts to participate, jointly but anonymously, in analyzing a problem. The problem to be examined in this study is the lack of knowledge of the professional and personal competencies needed of entry-level academic health sciences librarians.

Based on your record in the field of academic health sciences librarianship, you have been selected as an expert for this Delphi study. Your participation is voluntary, and your input is important as we discover the professional and personal competencies needed of entry-level academic health sciences librarians.

There will be four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software. It is anticipated that each round will take approximately 15 minutes for you to complete. All information obtained will be confidential.

If you agree to participate in this study, I have included the link to the first round questionnaire below.

{INSERT LINK}

Thank you in advance for your participation in this study! If you have any questions, feel free to contact me at jodi.philbrick@unt.edu or 940-XXX-XXXX.

Jodi L. Philbrick, MSLS
Doctoral Candidate
Interdisciplinary Ph.D. Program in Information Science
University of North Texas
jodi.philbrick@unt.edu

APPENDIX C

ROUND 1 QUESTIONNAIRE – ACADEMIC HEALTH SCIENCES LIBRARY

DIRECTORS

First Round A - Competencies Needed of Entry-Level Academic

Informed Consent Notice

My name is Jodi Philbrick, and I am a doctoral candidate in the Interdisciplinary Ph.D. Program in Information Science at the University of North Texas (UNT). I am conducting an online Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians." A Delphi study engages experts to participate, jointly but anonymously, in analyzing a problem. Based on your record in the field of academic health sciences librarianship, you have been selected as an expert for this Delphi study. The problem to be examined is the lack of knowledge of the professional and personal competencies needed of entry-level academic health sciences librarians.

There will be four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software. It is anticipated that the questionnaire for each round will take you approximately 15 minutes to complete. Your participation in this study may help us learn more about the professional and personal competencies needed of entry-level academic health sciences librarians.

Participation in this study is completely voluntary. There are no foreseeable risks involved in this study; however, if you decide to withdraw your participation you may do so at any time by simply leaving the study.

All research records will be kept confidential by the Principal Investigator, and no individual responses will be released as reporting will be done on a group basis. If you have any questions about the study, please contact Jodi Philbrick at ▮▮▮▮▮▮▮▮ or the faculty advisor, Dr. Ana D. Cleveland, UNT Department of Library and Information Sciences at 940-565-2445.

This research project has been reviewed and approved by the UNT Institutional Review Board. Please contact the UNT IRB at 940-565-3940 with any questions regarding your rights as a research subject.

If you agree to participate, you may print this document for your records.

By completing this survey, you are giving your informed consent to participate in this study.

Professional Competencies

Thank you for agreeing to participate in this study to examine the personal and professional competencies needed of entry-level academic health sciences librarians. Please keep in mind that you are thinking broadly about the professional and personal competencies needed of all types of academic health sciences librarians.

Part I: Professional Competencies

* 1. Please list ten (10) professional competencies (knowledge and skills for successful job performance) needed of entry-level academic health sciences librarians.

1. [_____]
2. [_____]
3. [_____]
4. [_____]
5. [_____]
6. [_____]
7. [_____]
8. [_____]
9. [_____]
10. [_____]

First Round A - Competencies Needed of Entry-Level Academic

2. Please list any additional professional competencies needed of entry-level academic health sciences librarians.

```
[                    ]
```

Personal Competencies

Part II: Personal Competencies

* 3. Please list ten (10) personal competencies (individual motives, traits, attitudes, and values for successful job performance) needed of entry-level academic health sciences librarians.

1. [   ]
2. [   ]
3. [   ]
4. [   ]
5. [   ]
6. [   ]
7. [   ]
8. [   ]
9. [   ]
10. [   ]

4. Please list any additional personal competencies needed of academic health sciences librarians.

```
[                    ]
```

Sex

Part III: Demographic Information

Please provide the following information about yourself:

* 5. Are you...?

○ Male

○ Female

Age

First Round A - Competencies Needed of Entry-Level Academic

* **6. How old are you?**

- ◯ Under 25
- ◯ 25 – 29
- ◯ 30 – 34
- ◯ 35 – 39
- ◯ 40 – 44
- ◯ 45 – 49
- ◯ 50 – 54
- ◯ 55 – 59
- ◯ 60 – 64
- ◯ 65 and over

Racial/Ethnic Background

* **7. Which of the following best describes your racial or ethnic background? Please select all that apply.**

- ☐ African-American
- ☐ American Indian
- ☐ Asian
- ☐ Hispanic or Latino
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White
- ☐ Other (please specify)
  [   ]

MLA Member

* **8. Are you a member of the Medical Library Association?**

- ◯ Yes
- ◯ No

MLA Membership - Logic

First Round A - Competencies Needed of Entry-Level Academic

* 9. How long have you been a member of the Medical Library Association?

- ◯ 1 – 5 years
- ◯ 6 – 10 years
- ◯ 11 – 15 years
- ◯ 16 – 20 years
- ◯ 20 – 24 years
- ◯ 25 or more years

Professional Associations

* 10. What professional associations are you a member of? Please select all that apply.

- ☐ American Medical Informatics Association (AMIA)
- ☐ American Library Association (ALA)
- ☐ American Society for Information Science and Technology (ASIS&T)
- ☐ Association for Library and Information Science Education (ALISE)
- ☐ Special Libraries Association (SLA)
- ☐ None of the above
- ☐ Other professional associations (please specify)

Library Career Experience

First Round A - Competencies Needed of Entry-Level Academic

* 11. In your library career experience, in which areas have you worked? Please select all that apply.

- ☐ Acquisitions
- ☐ Administration
- ☐ Cataloging
- ☐ Circulation
- ☐ Collection development
- ☐ Interlibrary loan
- ☐ Reference and instruction
- ☐ Outreach
- ☐ Systems
- ☐ Other

Other (please specify)

[   ]

Length - Library Director

* 12. How long have you been a director of an academic health sciences library?

- ○ 1 – 5 years
- ○ 6 – 10 years
- ○ 11 – 15 years
- ○ 16 – 20 years
- ○ 20 – 24 years
- ○ 25 or more years

Academic Appointment

* 13. Do you hold an academic appointment in addition to your director position?

- ○ Yes
- ○ No

Academic Appointment - Logic

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First Round A - Competencies Needed of Entry-Level Academic

* 14. At what rank is your academic appointment?

- ○ Adjunct Instructor
- ○ Lecturer
- ○ Assistant Professor
- ○ Associate Professor
- ○ Professor
- ○ Other (please specify)

  [ ]

Educational Background

* 15. What academic degree(s) do you hold? Please select all that apply.

- ☐ Master's degree in Library and Information Sciences
- ☐ Master's degree in Public Health (M.P.H.)
- ☐ Master's degree in Business Administration (M.B.A.)
- ☐ Master's degree in another discipline not listed here
- ☐ Doctor of Medicine (M.D.)
- ☐ Juris Doctor (J.D.)
- ☐ Doctor of Philosophy (Ph.D.)
- ☐ Doctor of Education (Ed.D./D.Ed.)
- ☐ Doctor of Arts (D.A.)
- ☐ Other

Other (please specify)

[ ]

MLS School

16. If you have a master's degree in library and information sciences, from what school did you receive your degree?

[ ]

Specialized Coures

First Round A - Competencies Needed of Entry-Level Academic

* 17. If you have a master's degree in library and information sciences, did you take any specialized courses in health sciences or medical librarianship?

◯ Yes

◯ No

◯ I do not have a master's degree in library and information sciences

Job Title

* 18. What is/are your current professional job title(s)?

Teaching Experience

* 19. Currently, do you teach any health sciences librarianship courses for a school of library and information sciences?

◯ Yes

◯ No

Courses

* 20. What health sciences librarianship courses are you currently teaching?

End

Thank you for completing the first round questionnaire!

APPENDIX D

ROUND 1 QUESTIONNAIRE – LIS EDUCATORS

First Round B - Competencies Needed of Entry-Level Academic

Informed Consent Notice

My name is Jodi Philbrick, and I am a doctoral candidate in the Interdisciplinary Ph.D. Program in Information Science at the University of North Texas (UNT). I am conducting an online Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians." A Delphi study engages experts to participate, jointly but anonymously, in analyzing a problem. Based on your record in the field of academic health sciences librarianship, you have been selected as an expert for this Delphi study. The problem to be examined is the lack of knowledge of the professional and personal competencies needed of entry-level academic health sciences librarians.

There will be four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software. It is anticipated that the questionnaire for each round will take you approximately 15 minutes to complete. Your participation in this study may help us learn more about the professional and personal competencies needed of entry-level academic health sciences librarians.

Participation in this study is completely voluntary. There are no foreseeable risks involved in this study; however, if you decide to withdraw your participation you may do so at any time by simply leaving the study.

All research records will be kept confidential by the Principal Investigator, and no individual responses will be released as reporting will be done on a group basis. If you have any questions about the study, please contact Jodi Philbrick at ███████ or the faculty advisor, Dr. Ana D. Cleveland, UNT Department of Library and Information Sciences at 940-565-2445.

This research project has been reviewed and approved by the UNT Institutional Review Board. Please contact the UNT IRB at 940-565-3940 with any questions regarding your rights as a research subject.

If you agree to participate, you may print this document for your records.

By completing this survey, you are giving your informed consent to participate in this study.

Professional Competencies

Thank you for agreeing to participate in this study to examine the personal and professional competencies needed of entry-level academic health sciences librarians. Please keep in mind that you are thinking broadly about the professional and personal competencies needed of all types of academic health sciences librarians.

Part I: Professional Competencies

* 1. Please list ten (10) professional competencies (knowledge and skills for successful job performance) needed of entry-level academic health sciences librarians.

1. [_____]
2. [_____]
3. [_____]
4. [_____]
5. [_____]
6. [_____]
7. [_____]
8. [_____]
9. [_____]
10. [_____]

First Round B - Competencies Needed of Entry-Level Academic

2. Please list any additional professional competencies needed of entry-level academic health sciences librarians.

[text box]

Personal Competencies

Part II: Personal Competencies

✱ 3. Please list ten (10) personal competencies (individual motives, traits, attitudes, and values for successful job performance) needed of entry-level academic health sciences librarians.

1. [input field]
2. [input field]
3. [input field]
4. [input field]
5. [input field]
6. [input field]
7. [input field]
8. [input field]
9. [input field]
10. [input field]

4. Please list any additional personal competencies needed of academic health sciences librarians.

[text box]

Sex

Part III: Demographic Information

Please provide the following information about yourself:

✱ 5. Are you...?

◯ Male
◯ Female

Age

First Round B - Competencies Needed of Entry-Level Academic

* 6. How old are you?

- ◯ Under 25
- ◯ 25 – 29
- ◯ 30 – 34
- ◯ 35 – 39
- ◯ 40 – 44
- ◯ 45 – 49
- ◯ 50 – 54
- ◯ 55 – 59
- ◯ 60 – 64
- ◯ 65 and over

Racial/Ethnic Background

* 7. Which of the following best describes your racial or ethnic background? Please select all that apply.

- ☐ African-American
- ☐ American Indian
- ☐ Asian
- ☐ Hispanic or Latino
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White
- ☐ Other (please specify)

[   ]

MLA Member

* 8. Are you a member of the Medical Library Association?

- ◯ Yes
- ◯ No

MLA Membership - Logic

First Round B - Competencies Needed of Entry-Level Academic

* 9. How long have you been a member of the Medical Library Association?

- ◯ 1 – 5 years
- ◯ 6 – 10 years
- ◯ 11 – 15 years
- ◯ 16 – 20 years
- ◯ 20 – 24 years
- ◯ 25 or more years

Professional Associations

* 10. What professional associations are you a member of? Please select all that apply.

- ☐ American Medical Informatics Association (AMIA)
- ☐ American Library Association (ALA)
- ☐ American Society for Information Science and Technology (ASIS&T)
- ☐ Association for Library and Information Science Education (ALISE)
- ☐ Special Libraries Association (SLA)
- ☐ None of the above
- ☐ Other professional associations (please specify)

Library Career Experience

First Round B - Competencies Needed of Entry-Level Academic

* 11. In your library career experience, in which areas have you worked? Please select all that apply.

- ☐ Acquisitions
- ☐ Administration
- ☐ Cataloging
- ☐ Circulation
- ☐ Collection development
- ☐ Interlibrary loan
- ☐ Reference and instruction
- ☐ Outreach
- ☐ Systems
- ☐ I have never worked in a library
- ☐ Other

Other (please specify)

[   ]

Length - Academic Health Sciences Library

* 12. How long did you work in an academic health sciences library?

- ◯ 1 – 5 years
- ◯ 6 – 10 years
- ◯ 11 – 15 years
- ◯ 16 – 20 years
- ◯ 20 – 24 years
- ◯ 25 or more years
- ◯ I have never worked in an academic health sciences library

Length - Faculty Member

First Round B - Competencies Needed of Entry-Level Academic

* 13. How long have you been a full-time library and information sciences (LIS) faculty member?

○ 1 – 5 years

○ 6 – 10 years

○ 11 – 15 years

○ 16 – 20 years

○ 20 – 24 years

○ 25 or more years

Faculty Rank

* 14. What is your faculty rank?

○ Lecturer

○ Assistant Professor

○ Associate Professor

○ Professor

○ Other

Other (please specify)

[   ]

Educational Background

* 15. What academic degree(s) do you hold? Please select all that apply.

☐ Master's degree in Library and Information Sciences

☐ Master's degree in Public Health (M.P.H.)

☐ Master's degree in Business Administration (M.B.A.)

☐ Master's degree in another discipline not listed here

☐ Doctor of Medicine (M.D.)

☐ Juris Doctor (J.D.)

☐ Doctor of Philosophy (Ph.D.)

☐ Doctor of Education (Ed.D./D.Ed.)

☐ Doctor of Arts (D.A.)

☐ Other

Other (please specify)

[   ]

MLS School

First Round B - Competencies Needed of Entry-Level Academic

16. If you have a master's degree in library and information sciences, from what school did you receive your degree?

[text field]

Specialized Coures

* 17. If you have a master's degree in library and information sciences, did you take any specialized courses in health sciences or medical librarianship?

◯ Yes

◯ No

◯ I do not have a master's degree in library and information sciences

Job Title

* 18. What is/are your current professional job title(s)?

[text field]

Courses

* 19. What health sciences librarianship courses do you teach or have you taught?

[text field]

End

Thank you for completing the first round questionnaire!

APPENDIX E

ROUND 1 QUESTIONNAIRE – LIS ADJUNCT FACULTY/HEALTH SCIENCES

LIBRARIANSHIP PRACTITIONERS

First Round C - Competencies Needed of Entry-Level Academic

Informed Consent Notice

My name is Jodi Philbrick, and I am a doctoral candidate in the Interdisciplinary Ph.D. Program in Information Science at the University of North Texas (UNT). I am conducting an online Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians." A Delphi study engages experts to participate, jointly but anonymously, in analyzing a problem. Based on your record in the field of academic health sciences librarianship, you have been selected as an expert for this Delphi study. The problem to be examined is the lack of knowledge of the professional and personal competencies needed of entry-level academic health sciences librarians.

There will be four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software. It is anticipated that the questionnaire for each round will take you approximately 15 minutes to complete. Your participation in this study may help us learn more about the professional and personal competencies needed of entry-level academic health sciences librarians.

Participation in this study is completely voluntary. There are no foreseeable risks involved in this study; however, if you decide to withdraw your participation you may do so at any time by simply leaving the study.

All research records will be kept confidential by the Principal Investigator, and no individual responses will be released as reporting will be done on a group basis. If you have any questions about the study, please contact Jodi Philbrick at ███████████ or the faculty advisor, Dr. Ana D. Cleveland, UNT Department of Library and Information Sciences at 940-565-2445.

This research project has been reviewed and approved by the UNT Institutional Review Board. Please contact the UNT IRB at 940-565-3940 with any questions regarding your rights as a research subject.

If you agree to participate, you may print this document for your records.

By completing this survey, you are giving your informed consent to participate in this study.

Professional Competencies

Thank you for agreeing to participate in this study to examine the personal and professional competencies needed of entry-level academic health sciences librarians. Please keep in mind that you are thinking broadly about the professional and personal competencies needed of all types of academic health sciences librarians.

Part I: Professional Competencies

* 1. Please list ten (10) professional competencies (knowledge and skills for successful job performance) needed of entry-level academic health sciences librarians.

1. [_____]
2. [_____]
3. [_____]
4. [_____]
5. [_____]
6. [_____]
7. [_____]
8. [_____]
9. [_____]
10. [_____]

First Round C - Competencies Needed of Entry-Level Academic

2. Please list any additional professional competencies needed of entry-level academic health sciences librarians.

[text box]

Personal Competencies

Part II: Personal Competencies

* 3. Please list ten (10) personal competencies (individual motives, traits, attitudes, and values for successful job performance) needed of entry-level academic health sciences librarians.

1. [ ]
2. [ ]
3. [ ]
4. [ ]
5. [ ]
6. [ ]
7. [ ]
8. [ ]
9. [ ]
10. [ ]

4. Please list any additional personal competencies needed of academic health sciences librarians.

[text box]

Sex

Part III: Demographic Information

Please provide the following information about yourself:

* 5. Are you...?

◯ Male
◯ Female

Age

First Round C - Competencies Needed of Entry-Level Academic

* 6. How old are you?

○ Under 25

○ 25 – 29

○ 30 – 34

○ 35 – 39

○ 40 – 44

○ 45 – 49

○ 50 – 54

○ 55 – 59

○ 60 – 64

○ 65 and over

Racial/Ethnic Background

* 7. Which of the following best describes your racial or ethnic background? Please select all that apply.

☐ African-American

☐ American Indian

☐ Asian

☐ Hispanic or Latino

☐ Native Hawaiian or Other Pacific Islander

☐ White

☐ Other (please specify)

[ ]

MLA Member

* 8. Are you a member of the Medical Library Association?

○ Yes

○ No

MLA Membership - Logic

First Round C - Competencies Needed of Entry-Level Academic

* 9. How long have you been a member of the Medical Library Association?

○ 1 – 5 years

○ 6 – 10 years

○ 11 – 15 years

○ 16 – 20 years

○ 20 – 24 years

○ 25 or more years

Professional Associations

* 10. What professional associations are you a member of? Please select all that apply.

☐ American Medical Informatics Association (AMIA)

☐ American Library Association (ALA)

☐ American Society for Information Science and Technology (ASIS&T)

☐ Association for Library and Information Science Education (ALISE)

☐ Special Libraries Association (SLA)

☐ None of the above

☐ Other professional associations (please specify)

Library Career Experience

First Round C - Competencies Needed of Entry-Level Academic

* 11. In your library career experience, in which areas have you worked? Please select all that apply.

- ☐ Acquisitions
- ☐ Administration
- ☐ Cataloging
- ☐ Circulation
- ☐ Collection development
- ☐ Interlibrary loan
- ☐ Reference and instruction
- ☐ Outreach
- ☐ Systems
- ☐ Other

Other (please specify)

[_____]

Length - Academic Health Sciences Library

* 12. How long have you worked in an academic health sciences library?

- ○ 1 – 5 years
- ○ 6 – 10 years
- ○ 11 – 15 years
- ○ 16 – 20 years
- ○ 20 – 24 years
- ○ 25 or more years

Length - Faculty Member

* 13. How long have you been a part-time faculty member for a school of library and information sciences?

- ○ 1 – 5 years
- ○ 6 – 10 years
- ○ 11 – 15 years
- ○ 16 – 20 years
- ○ 20 – 24 years
- ○ 25 or more years

Faculty Rank

First Round C - Competencies Needed of Entry-Level Academic

* 14. What is your faculty rank at the school of library and information sciences?

◯ Adjunct Instructor

◯ Lecturer

◯ Other

Other (please specify)

[   ]

Educational Background

* 15. What academic degree(s) do you hold? Please select all that apply.

☐ Master's degree in Library and Information Sciences

☐ Master's degree in Public Health (M.P.H.)

☐ Master's degree in Business Administration (M.B.A.)

☐ Master's degree in another discipline not listed here

☐ Doctor of Medicine (M.D.)

☐ Juris Doctor (J.D.)

☐ Doctor of Philosophy (Ph.D.)

☐ Doctor of Education (Ed.D./D.Ed.)

☐ Doctor of Arts (D.A.)

☐ Other

Other (please specify)

[   ]

MLS School

16. If you have a master's degree in library and information sciences, from what school did you receive your degree?

[   ]

Specialized Coures

* 17. If you have a master's degree in library and information sciences, did you take any specialized courses in health sciences or medical librarianship?

◯ Yes

◯ No

◯ I do not have a master's of library and information sciences

Job Title

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First Round C - Competencies Needed of Entry-Level Academic

* 18. What is/are your current professional job title(s)?

LIS Schools

* 19. For what schools of library and information sciences have you taught health sciences librarianship courses?

LIS Courses

* 20. What health sciences librarianship courses do you teach or have you taught for schools of library and information sciences?

End

Thank you for completing the first round questionnaire!

APPENDIX F

ROUND 2 – ELECTRONIC MAIL MESSAGE TO EXPERTS

Subject: Invitation to Second Round of Research Study: Competencies of Entry-Level Academic Health Sciences Librarians

Dear {INSERT NAME},

Thank you for completing the first round of the Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians."

I would like to invite you to complete the second round questionnaire by {INSERT DATE}, and the link is included below.

{INSERT LINK}

As a reminder, there are a total of four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software, as you did in the first round. It is anticipated that each round will take approximately 15 minutes for you to complete. All information obtained will be confidential.

If you have any questions, feel free to contact me at jodi.philbrick@unt.edu or 940-XXX-XXXX.

Jodi L. Philbrick, MSLS
Doctoral Candidate
Interdisciplinary Ph.D. Program in Information Science
University of North Texas
jodi.philbrick@unt.edu

APPENDIX G

ROUND 2 QUESTIONNAIRE – ACADEMIC HEALTH SCIENCES LIBRARY

DIRECTORS

Second Round A: Competencies Needed of Entry-Level Academic

1. Informed Consent Notice

My name is Jodi Philbrick, and I am a doctoral candidate in the Interdisciplinary Ph.D. Program in Information Science at the University of North Texas (UNT). I am conducting an online Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians." A Delphi study engages experts to participate, jointly but anonymously, in analyzing a problem. Based on your record in the field of academic health sciences librarianship, you have been selected as an expert for this Delphi study. The problem to be examined is the lack of knowledge of the professional and personal competencies needed of entry-level academic health sciences librarians.

There will be four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software. It is anticipated that the questionnaire for each round will take you approximately 15 minutes to complete. Your participation in this study may help us learn more about the professional and personal competencies needed of entry-level academic health sciences librarians.

Participation in this study is completely voluntary. There are no foreseeable risks involved in this study; however, if you decide to withdraw your participation you may do so at any time by simply leaving the study.

All research records will be kept confidential by the Principal Investigator, and no individual responses will be released as reporting will be done on a group basis. If you have any questions about the study, please contact Jodi Philbrick at ▮▮▮▮▮▮▮▮ or the faculty advisor, Dr. Ana D. Cleveland, UNT Department of Library and Information Sciences at 940-565-2445.

This research project has been reviewed and approved by the UNT Institutional Review Board. Please contact the UNT IRB at 940-565-3940 with any questions regarding your rights as a research subject.

If you agree to participate, you may print this document for your records.

By completing this survey, you are giving your informed consent to participate in this study.

2. Begin

Thank you for completing the first round of Delphi study to determine the professional and personal competencies needed of entry-level academic health sciences librarians.

In this second round of the Delphi study, you will be rating the importance professional and personal competencies identified in the first round.

3. Rating of Professional Competencies

Second Round A: Competencies Needed of Entry-Level Academic

* 1. For each professional competency listed below, please rate its importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

	5 - critically Important	4 - very important	3 - important	2 - not very Important	1 - not important
Ability to develop, build, and evaluate Web content	○	○	○	○	○
Knowledge of how medicine "works"	○	○	○	○	○
Ability to read and understand basic medical articles	○	○	○	○	○
Organized inquiry skill	○	○	○	○	○
Science or clinical background	○	○	○	○	○
Ability to determine and meet the information needs of users	○	○	○	○	○
Knowledge of legal and policy issues, such as copyright	○	○	○	○	○
Understanding of scholarly communications systems	○	○	○	○	○
Ability to integrate into the institutional community	○	○	○	○	○
Basics of learning and keeping up-to-date on databases	○	○	○	○	○
Flexibility	○	○	○	○	○
Financial literacy skills	○	○	○	○	○
Oral presentation skills	○	○	○	○	○
Basic understanding of translational medicine cycle	○	○	○	○	○
Political skills	○	○	○	○	○
Knowledge of issues and trends in health sciences environment	○	○	○	○	○
General knowledge of library operations	○	○	○	○	○
Ability to understand complex concepts and translate them into instruction	○	○	○	○	○
Knowledge of ethical issues	○	○	○	○	○
Ability to write a basic grant application	○	○	○	○	○

Second Round A: Competencies Needed of Entry-Level Academic

Ability to organize content and structure records	○	○	○	○	○
Knowledge of the health sciences culture	○	○	○	○	○
Conversant with intellectual property law and history	○	○	○	○	○
Project management skills	○	○	○	○	○
Ability to use technology to enhance job responsibilities	○	○	○	○	○
Understanding of the historical context for libraries	○	○	○	○	○
Understanding of the controlled vocabulary of health sciences	○	○	○	○	○
Knowledge of health sciences information resources and services	○	○	○	○	○
Ability to identify and select quality health information for respective audiences (health care providers, researchers, students, patients and their families, the lay public	○	○	○	○	○
Networking skills	○	○	○	○	○
Reference interview skills	○	○	○	○	○
Knowledge of Web design principles	○	○	○	○	○
Detail-oriented	○	○	○	○	○
Knowledge of medical terminology	○	○	○	○	○
Knowledge of Web-based information delivery, including Web 2.0/3.0 tools	○	○	○	○	○
Knowledge of retrieval systems, including both licensed and open resources	○	○	○	○	○
Ability to work as a team player with all levels of employees	○	○	○	○	○
Negotiation skills	○	○	○	○	○
Ability to conduct research in librarianship	○	○	○	○	○
Familiarity with basic medical texts	○	○	○	○	○
Open-mindedness	○	○	○	○	○

Second Round A: Competencies Needed of Entry-Level Academic

Organizational skills	○	○	○	○	○
Understanding and application of library management techniques	○	○	○	○	○
Ability to plan and evaluate library services, resources, staff and report specific outcomes	○	○	○	○	○
Awareness of current issues in scholarly publishing	○	○	○	○	○
Problem-solving and analytical skills	○	○	○	○	○
Knowledge of PubMed	○	○	○	○	○
Familiarity with social networking tools	○	○	○	○	○
Knowledge of the structure and nature of information, especially in the health sciences	○	○	○	○	○
Ability to design information systems for delivering scholarly information to users	○	○	○	○	○
Understanding of the organizational scheme of library resources	○	○	○	○	○
Basic understanding of the 5-step process of evidence-based librarianship	○	○	○	○	○
Understanding of basic management and leadership principles	○	○	○	○	○
Creativity	○	○	○	○	○
General knowledge of academic health center operations	○	○	○	○	○
Written, oral, and web-based communication skills	○	○	○	○	○
Knowledge and ability to do data mining	○	○	○	○	○
Ability to effectively teach library users	○	○	○	○	○
Knowledge of and use of current, new, and emerging technologies having an impact on services/resources	○	○	○	○	○
Understanding of user information seeking behaviors	○	○	○	○	○

Second Round A: Competencies Needed of Entry-Level Academic

Ability to work alone and as part of a team	◯	◯	◯	◯	◯
Knowledge of health information literacy	◯	◯	◯	◯	◯
Ability to interpret user needs and devise innovative services to meet those needs	◯	◯	◯	◯	◯
Knowledge of trends in health sciences libraries	◯	◯	◯	◯	◯
Understanding of research methods	◯	◯	◯	◯	◯
Excellent interpersonal skills	◯	◯	◯	◯	◯
Knowledge of database searching basics	◯	◯	◯	◯	◯
Ability to engage users and colleagues about issues addressing organization and delivery topics	◯	◯	◯	◯	◯
Ability to retrieve, assess, and articulate information	◯	◯	◯	◯	◯
Expert searching skills	◯	◯	◯	◯	◯
Patience	◯	◯	◯	◯	◯
Time management skills	◯	◯	◯	◯	◯
Knowledge of database structure	◯	◯	◯	◯	◯
Sense of humor	◯	◯	◯	◯	◯
Knowledge and ability to do data analysis	◯	◯	◯	◯	◯
Knowledge and appreciation of medical informatics principles and best practices	◯	◯	◯	◯	◯
Literature searching skills	◯	◯	◯	◯	◯
Knowledge of cataloging and metadata	◯	◯	◯	◯	◯
Knowledge of budgeting	◯	◯	◯	◯	◯
Knowledge of the history of librarianship	◯	◯	◯	◯	◯
Emotional intelligence	◯	◯	◯	◯	◯
Willingness to learn	◯	◯	◯	◯	◯
Learning skills	◯	◯	◯	◯	◯
Ability to organize quality health information for easy	◯	◯	◯	◯	◯

Second Round A: Competencies Needed of Entry-Level Academic

user access					
Strong computer and technical skills	○	○	○	○	○
Inquisitive nature	○	○	○	○	○
Technical (not creative) writing skills	○	○	○	○	○
Knowledge of health sciences subject matter	○	○	○	○	○

4. Rating of Personal Competencies

* 2. For each personal competency listed below, please rate its importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

	5 - critically important	4 - very important	3 - important	2 - not very important	1 - not important
Creativity	○	○	○	○	○
Generous in spirit	○	○	○	○	○
Self-direction	○	○	○	○	○
Honesty	○	○	○	○	○
Self-starter	○	○	○	○	○
Entrepreneurial skills	○	○	○	○	○
Ability to take risks	○	○	○	○	○
Tolerance of disagreements or differences	○	○	○	○	○
Ability to work well with users and colleagues, individually or in teams	○	○	○	○	○
Ability to cope with change	○	○	○	○	○
Focus on quality and quality improvement	○	○	○	○	○
Recognition that there's always something to learn	○	○	○	○	○
Friendly	○	○	○	○	○
Appreciation of diversity	○	○	○	○	○
Ability to learn from mistakes	○	○	○	○	○
Service-orientation	○	○	○	○	○
Strong interpersonal skills	○	○	○	○	○
Ability to learn independently	○	○	○	○	○
Volunteer attitude	○	○	○	○	○

Second Round A: Competencies Needed of Entry-Level Academic

Ability to face conflict successfully	◯	◯	◯	◯	◯
Intellectual curiosity	◯	◯	◯	◯	◯
Values contributions to the profession	◯	◯	◯	◯	◯
Ability to see the big picture as well as the little details	◯	◯	◯	◯	◯
Sense of humor	◯	◯	◯	◯	◯
Patient	◯	◯	◯	◯	◯
Effective computer, computing and other technical skills	◯	◯	◯	◯	◯
Initiative	◯	◯	◯	◯	◯
Ability to understand users' behavior and needs	◯	◯	◯	◯	◯
Well-rounded	◯	◯	◯	◯	◯
Desire to help	◯	◯	◯	◯	◯
Comfortable with ambiguity	◯	◯	◯	◯	◯
Understanding of basic world knowledge	◯	◯	◯	◯	◯
Ability to learn new skills quickly	◯	◯	◯	◯	◯
Desire to achieve	◯	◯	◯	◯	◯
Excellence	◯	◯	◯	◯	◯
Embraces new things	◯	◯	◯	◯	◯
Ability to offer constructive criticism	◯	◯	◯	◯	◯
Ambition for self-improvement and growth	◯	◯	◯	◯	◯
Balance	◯	◯	◯	◯	◯
Outgoing	◯	◯	◯	◯	◯
Vision	◯	◯	◯	◯	◯
Respect for others	◯	◯	◯	◯	◯
Non-judgmental	◯	◯	◯	◯	◯
Ability to compromise	◯	◯	◯	◯	◯
Accountability	◯	◯	◯	◯	◯
Team player	◯	◯	◯	◯	◯
Self-confidence	◯	◯	◯	◯	◯
Pays attention to details	◯	◯	◯	◯	◯
Organizational/project management skills	◯	◯	◯	◯	◯
Positive attitude	◯	◯	◯	◯	◯
Ability and interest in	◯	◯	◯	◯	◯

networking					
Desire to learn	◯	◯	◯	◯	◯
Personable	◯	◯	◯	◯	◯
Integrity	◯	◯	◯	◯	◯
Flexibility	◯	◯	◯	◯	◯
Strong communication skills, both written and verbal	◯	◯	◯	◯	◯
Enthusiasm	◯	◯	◯	◯	◯
Collegiality	◯	◯	◯	◯	◯
Command of web-development tools and strategies	◯	◯	◯	◯	◯
Stamina	◯	◯	◯	◯	◯
Personal motivation	◯	◯	◯	◯	◯
Eagerness	◯	◯	◯	◯	◯
Desire to do best	◯	◯	◯	◯	◯
Optimist	◯	◯	◯	◯	◯
Potential to assume leadership responsibility	◯	◯	◯	◯	◯
Organized	◯	◯	◯	◯	◯
Interest in lifelong learning and professional development	◯	◯	◯	◯	◯
Hopefulness	◯	◯	◯	◯	◯
Willingness to pilot new projects	◯	◯	◯	◯	◯
Ability to think strategically	◯	◯	◯	◯	◯
Listening skills	◯	◯	◯	◯	◯
Perseverance	◯	◯	◯	◯	◯
Respect for confidentiality	◯	◯	◯	◯	◯
Effective teaching skills	◯	◯	◯	◯	◯
Professional ethics	◯	◯	◯	◯	◯
Acceptance of other people's differences	◯	◯	◯	◯	◯
Professional demeanor	◯	◯	◯	◯	◯
Analytic or problem-solving skills	◯	◯	◯	◯	◯
Professional engagement	◯	◯	◯	◯	◯
Passion and enthusiasm for the profession	◯	◯	◯	◯	◯
Willing to go above and beyond	◯	◯	◯	◯	◯

Second Round A: Competencies Needed of Entry-Level Academic

Helpful	◯	◯	◯	◯	◯
Ability to quickly determine the most efficient way to solve problems	◯	◯	◯	◯	◯
Ability to laugh at self	◯	◯	◯	◯	◯
Inquisitive	◯	◯	◯	◯	◯
Ability to focus	◯	◯	◯	◯	◯
Basic supervision skills	◯	◯	◯	◯	◯
Willing to share ideas and suggestions	◯	◯	◯	◯	◯
Innovative	◯	◯	◯	◯	◯
Not easily offended	◯	◯	◯	◯	◯
Ethical values	◯	◯	◯	◯	◯
Self-motivated	◯	◯	◯	◯	◯
Tactfulness	◯	◯	◯	◯	◯
Open-minded	◯	◯	◯	◯	◯

5. End

Thank you for your participation!

APPENDIX H

ROUND 2 QUESTIONNAIRE – LIS EDUCATORS

Second Round B: Competencies Needed of Entry-Level Academic

1. Informed Consent Notice

My name is Jodi Philbrick, and I am a doctoral candidate in the Interdisciplinary Ph.D. Program in Information Science at the University of North Texas (UNT). I am conducting an online Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians." A Delphi study engages experts to participate, jointly but anonymously, in analyzing a problem. Based on your record in the field of academic health sciences librarianship, you have been selected as an expert for this Delphi study. The problem to be examined is the lack of knowledge of the professional and personal competencies needed of entry-level academic health sciences librarians.

There will be four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software. It is anticipated that the questionnaire for each round will take you approximately 15 minutes to complete. Your participation in this study may help us learn more about the professional and personal competencies needed of entry-level academic health sciences librarians.

Participation in this study is completely voluntary. There are no foreseeable risks involved in this study; however, if you decide to withdraw your participation you may do so at any time by simply leaving the study.

All research records will be kept confidential by the Principal Investigator, and no individual responses will be released as reporting will be done on a group basis. If you have any questions about the study, please contact Jodi Philbrick at ▮▮▮▮▮▮▮▮ or the faculty advisor, Dr. Ana D. Cleveland, UNT Department of Library and Information Sciences at 940-565-2445.

This research project has been reviewed and approved by the UNT Institutional Review Board. Please contact the UNT IRB at 940-565-3940 with any questions regarding your rights as a research subject.

If you agree to participate, you may print this document for your records.

By completing this survey, you are giving your informed consent to participate in this study.

2. Begin

Thank you for completing the first round of Delphi study to determine the professional and personal competencies needed of entry-level academic health sciences librarians.

In this second round of the Delphi study, you will be rating the importance professional and personal competencies identified in the first round.

3. Rating of Professional Competencies

Second Round B: Competencies Needed of Entry-Level Academic

*1. For each professional competency listed below, please rate its importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

	5 - critically Important	4 - very important	3 - important	2 - not very Important	1 - not important
Ability to keep up-to-date with new information in the field	○	○	○	○	○
Knowledge of data mining	○	○	○	○	○
Ability to advocate	○	○	○	○	○
Basic understanding of fiscal management	○	○	○	○	○
Ability to work with people on different committees	○	○	○	○	○
Ability to be a good fit with existing group of colleagues	○	○	○	○	○
Understanding of professional roles and issues	○	○	○	○	○
Understanding of informatics, both academic and applied	○	○	○	○	○
Understanding of evidence-based medicine	○	○	○	○	○
Understanding of current telecommunications and information technologies	○	○	○	○	○
Outreach skills	○	○	○	○	○
Ability to plan your own professional development	○	○	○	○	○
Web site creation skills	○	○	○	○	○
Ability to network with administrators	○	○	○	○	○
Marketing research and application skills	○	○	○	○	○
Basic understanding of the theoretical and practical foundations of our field	○	○	○	○	○
Critical thinking skills	○	○	○	○	○
Understanding of bibliographic control	○	○	○	○	○
Strong interpersonal skills, both with clients and staff	○	○	○	○	○
Strong oral and written communication skills	○	○	○	○	○
Active listening skills	○	○	○	○	○
Basic knowledge of the health care professions	○	○	○	○	○
Knowledge of bioinformatics	○	○	○	○	○

Second Round B: Competencies Needed of Entry-Level Academic

Competency					
Ability and willingness to acquire domain knowledge as required	○	○	○	○	○
Understanding of professional context of medicine	○	○	○	○	○
Ability to relate research to clinical care and the community	○	○	○	○	○
Information retrieval skills	○	○	○	○	○
Professional demeanor	○	○	○	○	○
Willingness to be a team player or collaborator	○	○	○	○	○
Ability to plan, execute, and publish results from a simple scholarly research project	○	○	○	○	○
Professionalism	○	○	○	○	○
Knowledge of basic legal and ethical principles	○	○	○	○	○
Proficient in using Microsoft Office products	○	○	○	○	○
Knowledge of health information sources and services	○	○	○	○	○
Understanding of the credentialing processes for health professionals	○	○	○	○	○
Professional attitude and outlook	○	○	○	○	○
Knowledge of serials acquisition and management	○	○	○	○	○
MEDLINE search skills	○	○	○	○	○
Ability to network with other health care librarians	○	○	○	○	○
Collection development and management skills	○	○	○	○	○
Understanding the structure of complex bibliographic databases	○	○	○	○	○
Basic knowledge of public services	○	○	○	○	○
Knowledge of how the library is positioned within a health sciences or healthcare institution	○	○	○	○	○
Knowledge of biostatistics/epidemiology	○	○	○	○	○
Basic knowledge of technical services	○	○	○	○	○
Understanding of the cultural infrastructure of universities and health	○	○	○	○	○

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Second Round B: Competencies Needed of Entry-Level Academic

care

Problem-solving skills	◯	◯	◯	◯	◯
Basic understanding of management principles	◯	◯	◯	◯	◯
Ability to learn quickly	◯	◯	◯	◯	◯
Understanding of the principles of data, information & knowledge organization	◯	◯	◯	◯	◯
Ability to think outside the walls of the library	◯	◯	◯	◯	◯
Understanding of the scholarly publishing process	◯	◯	◯	◯	◯
Understanding of the technology issues in an electronic environment, such as privacy and security	◯	◯	◯	◯	◯
Understanding of advanced knowledge management systems	◯	◯	◯	◯	◯
Creativity	◯	◯	◯	◯	◯
Knowledge of all the competencies required for ALA-accredited LIS master's programs	◯	◯	◯	◯	◯
Knowledge of the information needs of health care professionals	◯	◯	◯	◯	◯
Knowledge of medical terminology	◯	◯	◯	◯	◯
Understanding of systems analysis and systems thinking	◯	◯	◯	◯	◯
Curiosity	◯	◯	◯	◯	◯
Understanding of the basic concepts of health care administration	◯	◯	◯	◯	◯
Understanding of the current health care environment	◯	◯	◯	◯	◯
Professional integrity and ethics	◯	◯	◯	◯	◯
Lifelong learning skills	◯	◯	◯	◯	◯
Instructional skills	◯	◯	◯	◯	◯

4. Rating of Personal Competencies

Second Round B: Competencies Needed of Entry-Level Academic

* 2. For each personal competency listed below, please rate its importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

	5 - critically Important	4 - very important	3 - important	2 - not very Important	1 - not important
Intelligence	◯	◯	◯	◯	◯
Collaborative	◯	◯	◯	◯	◯
Passion	◯	◯	◯	◯	◯
Comfortable getting out of the library and working on other committees	◯	◯	◯	◯	◯
Creativity	◯	◯	◯	◯	◯
Independent thinker	◯	◯	◯	◯	◯
Commitment to evidence-based practice	◯	◯	◯	◯	◯
Professionally active	◯	◯	◯	◯	◯
Diligence	◯	◯	◯	◯	◯
Maturity	◯	◯	◯	◯	◯
Ability to deal with "high-powered" clientele	◯	◯	◯	◯	◯
Confidence	◯	◯	◯	◯	◯
Interpersonal skills	◯	◯	◯	◯	◯
Self-motivated	◯	◯	◯	◯	◯
Ability to embrace and adapt to change	◯	◯	◯	◯	◯
Emotional intelligence	◯	◯	◯	◯	◯
Tenacity	◯	◯	◯	◯	◯
Ability to multi-task	◯	◯	◯	◯	◯
Political intelligence	◯	◯	◯	◯	◯
Curiosity	◯	◯	◯	◯	◯
Efficient time management	◯	◯	◯	◯	◯
Friendliness	◯	◯	◯	◯	◯
Willingness to learn	◯	◯	◯	◯	◯
Ambition	◯	◯	◯	◯	◯
Personal integrity	◯	◯	◯	◯	◯
Wanting to make a difference	◯	◯	◯	◯	◯
Embrace and encourage diversity	◯	◯	◯	◯	◯
Final List	◯	◯	◯	◯	◯
Enthusiasm	◯	◯	◯	◯	◯

Second Round B: Competencies Needed of Entry-Level Academic

Dedication	○	○	○	○	○
Professional passion	○	○	○	○	○
Team player	○	○	○	○	○
Sense of responsibility	○	○	○	○	○
Professionalism	○	○	○	○	○
Persistence	○	○	○	○	○
General interest in the profession	○	○	○	○	○
Ability to communicate effectively	○	○	○	○	○
Initiative	○	○	○	○	○
Assertiveness	○	○	○	○	○
Resilience	○	○	○	○	○
Sense of humor	○	○	○	○	○
Commitment to cooperate with professionals, inside and outside of library and information sciences	○	○	○	○	○
General interest in people	○	○	○	○	○
Value service	○	○	○	○	○
Empathy	○	○	○	○	○
Ability to see the big picture	○	○	○	○	○
Grace under pressure	○	○	○	○	○
Willingness to take creative risks	○	○	○	○	○
Critical thinker	○	○	○	○	○
Belief in ethical professional practice	○	○	○	○	○
Ability to fit into an existing group of colleagues	○	○	○	○	○
Pleasant demeanor	○	○	○	○	○
Flexibility	○	○	○	○	○
Desire to assist others	○	○	○	○	○
Analytical ability	○	○	○	○	○
Eye for vision and mission	○	○	○	○	○
Strong intellect	○	○	○	○	○
Strong motivation for lifelong learning	○	○	○	○	○

5. End

Second Round B: Competencies Needed of Entry-Level Academic

Thank you for your participation!

APPENDIX I

ROUND 2 QUESTIONNAIRE – LIS ADJUNCT FACULTY/HEALTH SCIENCES

LIBRARIANSHIP PRACTITIONERS

Second Round C: Competencies Needed of Entry-Level Academic

1. Informed Consent Notice

My name is Jodi Philbrick, and I am a doctoral candidate in the Interdisciplinary Ph.D. Program in Information Science at the University of North Texas (UNT). I am conducting an online Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians." A Delphi study engages experts to participate, jointly but anonymously, in analyzing a problem. Based on your record in the field of academic health sciences librarianship, you have been selected as an expert for this Delphi study. The problem to be examined is the lack of knowledge of the professional and personal competencies needed of entry-level academic health sciences librarians.

There will be four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software. It is anticipated that the questionnaire for each round will take you approximately 15 minutes to complete. Your participation in this study may help us learn more about the professional and personal competencies needed of entry-level academic health sciences librarians.

Participation in this study is completely voluntary. There are no foreseeable risks involved in this study; however, if you decide to withdraw your participation you may do so at any time by simply leaving the study.

All research records will be kept confidential by the Principal Investigator, and no individual responses will be released as reporting will be done on a group basis. If you have any questions about the study, please contact Jodi Philbrick at ███████████ or the faculty advisor, Dr. Ana D. Cleveland, UNT Department of Library and Information Sciences at 940-565-2445.

This research project has been reviewed and approved by the UNT Institutional Review Board. Please contact the UNT IRB at 940-565-3940 with any questions regarding your rights as a research subject.

If you agree to participate, you may print this document for your records.

By completing this survey, you are giving your informed consent to participate in this study.

2. Begin

Thank you for completing the first round of Delphi study to determine the professional and personal competencies needed of entry-level academic health sciences librarians.

In this second round of the Delphi study, you will be rating the importance professional and personal competencies identified in the first round.

3. Rating of Professional Competencies

Second Round C: Competencies Needed of Entry-Level Academic

* 1. For each professional competency listed below, please rate its importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

	5 - critically important	4 - very important	3 - important	2 - not very important	1 - not important
Knowledge and competence in social and cultural diversity	◯	◯	◯	◯	◯
Knowledge of customer service standards for information professionals in the health care and research enterprise	◯	◯	◯	◯	◯
Understanding of data organization, including the Medical Subject Headings (MeSH)	◯	◯	◯	◯	◯
Understanding of scholarly communication, including copyright and open access	◯	◯	◯	◯	◯
Understanding of information needs in the health sciences	◯	◯	◯	◯	◯
Resilience in attitude toward receiving feedback and expecting that most innovation faces initial resistance	◯	◯	◯	◯	◯
Ability to evaluate the various users in a health setting	◯	◯	◯	◯	◯
Knowledge about health sciences environment and trends	◯	◯	◯	◯	◯
Project management skills	◯	◯	◯	◯	◯
Understanding of subject headings and metadata tags used in health care	◯	◯	◯	◯	◯
Commitment to life-long learning, both knowledge and skill development	◯	◯	◯	◯	◯
Ability to innovate	◯	◯	◯	◯	◯
Ability to critically assess clinical research articles	◯	◯	◯	◯	◯
Familiarity with research methods and	◯	◯	◯	◯	◯

design

Oral and written communication skills	◯	◯	◯	◯	◯
Teaching and instructional design skills, including knowledge of pedagogy	◯	◯	◯	◯	◯
Understanding of database design and management	◯	◯	◯	◯	◯
Common sense	◯	◯	◯	◯	◯
Basic information management skills	◯	◯	◯	◯	◯
Database searching skills	◯	◯	◯	◯	◯
Proficiency with and interest in current and emerging information technologies	◯	◯	◯	◯	◯
Advanced computer skills	◯	◯	◯	◯	◯
Understanding of evidence-based medicine	◯	◯	◯	◯	◯
Knowledge about health sciences librarianship	◯	◯	◯	◯	◯
Competence and skill in team-based collaborative activities	◯	◯	◯	◯	◯
Knowledge and competence in library acquisition, including preparation to adapt to local purchasing conventions	◯	◯	◯	◯	◯
Understanding of the importance of immediacy in health care and ability to react quickly	◯	◯	◯	◯	◯
Knowledge of the American Library Association (ALA) Code of Ethics	◯	◯	◯	◯	◯
Theoretical and practical understanding of RSS, both for tracking emerging knowledge and building self-updating web pages	◯	◯	◯	◯	◯
Competence with functional and theoretical application of citation	◯	◯	◯	◯	◯

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Second Round C: Competencies Needed of Entry-Level Academic

management tools					
Ability to apply theory	○	○	○	○	○
Medical literature searching skills	○	○	○	○	○
Commitment to being a librarian	○	○	○	○	○
Vision	○	○	○	○	○
Mastery of English language competence required in a US academic health sciences campus	○	○	○	○	○
Basic reference skills, including interviewing, retrieval, and evaluation	○	○	○	○	○
Analytical skills	○	○	○	○	○
Ability to recognize that academic health sciences librarianship requires more than 9-5 M-F commitment	○	○	○	○	○
Strong knowledge of the health sciences literature, including print and electronic resources	○	○	○	○	○
Ability to build Web documents, including blogs, libguides, and other non-programming interfaces	○	○	○	○	○
Ability to match health information needs with available information resources	○	○	○	○	○
Interpersonal skills	○	○	○	○	○
Dedication	○	○	○	○	○
Knowledge of Information ethics and health care ethical issues	○	○	○	○	○
Strong knowledge of US health care education, especially the Accreditation Council for Graduate Medical Education (ACGME) core competencies	○	○	○	○	○
Understanding of basic descriptive and inferential statistics	○	○	○	○	○
Ability to work under	○	○	○	○	○

pressure

	5	4	3	2	1
Familiarity with Web design and usage	○	○	○	○	○

4. Rating of Personal Competencies

* 2. For each personal competency listed below, please rate its importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

	5 - critically important	4 - very important	3 - important	2 - not very important	1 - not important
Leadership skills	○	○	○	○	○
Ability to adapt to change	○	○	○	○	○
Course development skills	○	○	○	○	○
Time management skills	○	○	○	○	○
Collaborative orientation	○	○	○	○	○
Creativity	○	○	○	○	○
Communication skills	○	○	○	○	○
Personality	○	○	○	○	○
Enthusiasm for new information technologies	○	○	○	○	○
Professional attitude	○	○	○	○	○
Background in the sciences	○	○	○	○	○
Social vision; looks right at customers and colleagues	○	○	○	○	○
Basic technical service skills	○	○	○	○	○
Doggedness; never gives up	○	○	○	○	○
Seeks positive solutions	○	○	○	○	○
Interest in working in interprofessional teams	○	○	○	○	○
Flexibility	○	○	○	○	○
Attention to detail	○	○	○	○	○
Proactive	○	○	○	○	○
Interested in other people	○	○	○	○	○
Ability to work with others in a collegial and professional manner	○	○	○	○	○
Ability to deal with fluid boundaries of field--	○	○	○	○	○

Second Round C: Competencies Needed of Entry-Level Academic

not set in what libraries or librarians do					
Teaching skills	◯	◯	◯	◯	◯
Self-aware	◯	◯	◯	◯	◯
Intelligent	◯	◯	◯	◯	◯
Communicator	◯	◯	◯	◯	◯
Ability to identify and evaluate possible solutions to problems/barriers	◯	◯	◯	◯	◯
Basic reference skills	◯	◯	◯	◯	◯
Positive	◯	◯	◯	◯	◯
Ability to take risks	◯	◯	◯	◯	◯
Innovator	◯	◯	◯	◯	◯
Knowledge of important databases, such as CINAHL	◯	◯	◯	◯	◯
Searching skills for Medline in any format	◯	◯	◯	◯	◯
Outreach skills	◯	◯	◯	◯	◯
Continuous learner; is able to keep up with changing environment	◯	◯	◯	◯	◯
Ability to improve services	◯	◯	◯	◯	◯
Analytical	◯	◯	◯	◯	◯
Understanding of American Library Association Code of Ethics	◯	◯	◯	◯	◯
Ethical	◯	◯	◯	◯	◯
Self-learner	◯	◯	◯	◯	◯
Ability to work independently, requesting appropriate input/guidance when needed	◯	◯	◯	◯	◯
Commitment to ongoing professional development	◯	◯	◯	◯	◯
Self-motivated	◯	◯	◯	◯	◯
Team player	◯	◯	◯	◯	◯
Loyalty	◯	◯	◯	◯	◯
Emotional intelligence	◯	◯	◯	◯	◯
Curiosity	◯	◯	◯	◯	◯
Pursues a work/life balance that is sustainable	◯	◯	◯	◯	◯

Second Round C: Competencies Needed of Entry-Level Academic

Understands and honors confidentiality	○	○	○	○	○
Appreciation of various cultural/professional contexts	○	○	○	○	○
Application of knowledge	○	○	○	○	○
Organized	○	○	○	○	○
Seeks opportunities to be involved	○	○	○	○	○
Repays debts of gratitude in a variety of ways	○	○	○	○	○
Strong sense of own integrity	○	○	○	○	○
Service oriented	○	○	○	○	○
Respect	○	○	○	○	○
Sense of humor	○	○	○	○	○
Humility; ability to be wrong and admit it	○	○	○	○	○
Generosity	○	○	○	○	○
Commitment to serve	○	○	○	○	○
Community-centered; genuinely desires consensus and harmony	○	○	○	○	○
Self-confident	○	○	○	○	○
Fiscally aware	○	○	○	○	○
Knowledge of medical terminology, such as MeSH	○	○	○	○	○

5. End

Thank you for your participation!

APPENDIX J

ROUND 3 QUESTIONNAIRE – ACADEMIC HEALTH SCIENCES LIBRARY

DIRECTORS

Third Round A: Competencies Needed of Entry-Level Academic Health

1. Informed Consent Notice

My name is Jodi Philbrick, and I am a doctoral candidate in the Interdisciplinary Ph.D. Program in Information Science at the University of North Texas (UNT). I am conducting an online Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians." A Delphi study engages experts to participate, jointly but anonymously, in analyzing a problem. Based on your record in the field of academic health sciences librarianship, you have been selected as an expert for this Delphi study. The problem to be examined is the lack of knowledge of the professional and personal competencies needed of entry-level academic health sciences librarians.

There will be four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software. It is anticipated that the questionnaire for each round will take you approximately 15 minutes to complete. Your participation in this study may help us learn more about the professional and personal competencies needed of entry-level academic health sciences librarians.

Participation in this study is completely voluntary. There are no foreseeable risks involved in this study; however, if you decide to withdraw your participation you may do so at any time by simply leaving the study.

All research records will be kept confidential by the Principal Investigator, and no individual responses will be released as reporting will be done on a group basis. If you have any questions about the study, please contact Jodi Philbrick at ███████ or the faculty advisor, Dr. Ana D. Cleveland, UNT Department of Library and Information Sciences at 940-565-2445.

This research project has been reviewed and approved by the UNT Institutional Review Board. Please contact the UNT IRB at 940-565-3940 with any questions regarding your rights as a research subject.

If you agree to participate, you may print this document for your records.

By completing this survey, you are giving your informed consent to participate in this study.

2. Begin

Thank you for completing the first and second rounds of Delphi study to determine the professional and personal competencies needed of entry-level academic health sciences librarians.

In this third round of the Delphi study, you will be re-rating the importance of the professional and personal competencies identified in the first round to reach consensus on the importance of these items.

3. Rating of Professional Competencies

Third Round A: Competencies Needed of Entry-Level Academic Health

* 1. Please read each professional competency listed below. Look at the median associated with that competency. The median was calculated from the second round data.

Next, please re-rate each competency's importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

For your reference:

Median = the middle number of a set of numbers arranged in numerical order (note: if the number of values in a set is even, then the median is the sum of the two middle values, divided by 2)

	5 - critically important	4 - very important	3 - important	2 - not very important	1 - not important
Conversant with intellectual property law and history (Median = 3)	○	○	○	○	○
Knowledge of medical terminology (Median = 3)	○	○	○	○	○
Problem-solving and analytical skills (Median = 5)	○	○	○	○	○
Basic understanding of translational medicine cycle (Median = 3)	○	○	○	○	○
Understanding of user information seeking behaviors (Median = 4)	○	○	○	○	○
Science or clinical background (Median = 2)	○	○	○	○	○
Knowledge of Web design principles (Median = 3)	○	○	○	○	○
Knowledge of health sciences information resources and services (Median = 4)	○	○	○	○	○
Knowledge of PubMed (Median = 4)	○	○	○	○	○
Ability to plan and evaluate library services, resources, staff and report specific outcomes (Median = 3)	○	○	○	○	○
Basics of learning and keeping up-to-date on databases	○	○	○	○	○

Third Round A: Competencies Needed of Entry-Level Academic Health

(Median = 4)					
Oral presentation skills (Median = 4)	○	○	○	○	○
General knowledge of academic health center operations (Median = 3)	○	○	○	○	○
Ability to effectively teach library users (Median = 4)	○	○	○	○	○
Emotional Intelligence (Median = 5)	○	○	○	○	○
Ability to use technology to enhance job responsibilities (Median = 4)	○	○	○	○	○
Organized inquiry skill (Median = 4)	○	○	○	○	○
Knowledge of health information literacy (Median = 3)	○	○	○	○	○
Knowledge of database structure (Median = 3)	○	○	○	○	○
Inquisitive nature (Median = 5)	○	○	○	○	○
Knowledge of Web-based information delivery, including Web 2.0/3.0 tools (Median = 3)	○	○	○	○	○
Ability to read and understand basic medical articles (Median = 3)	○	○	○	○	○
Ability to conduct research in librarianship (Median = 3)	○	○	○	○	○
Ability to retrieve, assess, and articulate information (Median = 4)	○	○	○	○	○
Ability to organize content and structure records (Median = 4)	○	○	○	○	○
Ability to engage users and colleagues about issues addressing organization and delivery topics (Median = 3)	○	○	○	○	○
Open-mindedness (Median = 5)	○	○	○	○	○
Knowledge of health sciences subject matter (Median = 3)	○	○	○	○	○
Knowledge of and use of current, new, and emerging technologies having an impact on	○	○	○	○	○

Third Round A: Competencies Needed of Entry-Level Academic Health

services/resources (Median = 4)					
Project management skills (Median = 4)	◯	◯	◯	◯	◯
Learning skills (Median = 5)	◯	◯	◯	◯	◯
Knowledge of database searching basics (Median = 4)	◯	◯	◯	◯	◯
Knowledge of issues and trends in health sciences environment (Median = 4)	◯	◯	◯	◯	◯
Familiarity with social networking tools (Median = 3)	◯	◯	◯	◯	◯
Sense of humor (Median = 4)	◯	◯	◯	◯	◯
Knowledge of legal and policy issues, such as copyright	◯	◯	◯	◯	◯
Awareness of current issues in scholarly publishing (Median = 3)	◯	◯	◯	◯	◯
Networking skills (Median = 5)	◯	◯	◯	◯	◯
Basic understanding of the 5-step process of evidence-based librarianship (Median = 3)	◯	◯	◯	◯	◯
Organizational skills (Median = 5)	◯	◯	◯	◯	◯
Willingness to learn (Median = 5)	◯	◯	◯	◯	◯
Ability to work alone and as part of a team (Median = 5)	◯	◯	◯	◯	◯
Ability to understand complex concepts and translate them into instruction (Median = 4)	◯	◯	◯	◯	◯
Understanding of research methods (Median = 3)	◯	◯	◯	◯	◯
Excellent interpersonal skills (Median = 5)	◯	◯	◯	◯	◯
Negotiation skills (Median = 3)	◯	◯	◯	◯	◯
Knowledge of the health sciences culture (Median = 3)	◯	◯	◯	◯	◯
Technical (not creative) writing skills (Median = 4)	◯	◯	◯	◯	◯
Reference interview skills (Median = 5)	◯	◯	◯	◯	◯

Third Round A: Competencies Needed of Entry-Level Academic Health

Understanding of the historical context for libraries (Median = 2)	○	○	○	○	○
Knowledge of the history of librarianship (Median = 2)	○	○	○	○	○
Knowledge and ability to do data analysis (Median = 3)	○	○	○	○	○
Knowledge of the structure and nature of information, especially in the health sciences (Median = 3)	○	○	○	○	○
Ability to design information systems for delivering scholarly information to users (Median = 3)	○	○	○	○	○
Creativity (Median = 4)	○	○	○	○	○
Knowledge and appreciation of medical informatics principles and best practices (Median = 3)	○	○	○	○	○
Knowledge and ability to do data mining (Median = 2)	○	○	○	○	○
Expert searching skills (Median = 4)	○	○	○	○	○
Ability to integrate into the institutional community (Median = 4)	○	○	○	○	○
Patience (Median = 4)	○	○	○	○	○
Literature searching skills (Median = 4)	○	○	○	○	○
Understanding of scholarly communications systems (Median = 4)	○	○	○	○	○
Financial literacy skills (Median = 2)	○	○	○	○	○
Understanding of the organizational scheme of library resources (Median = 3)	○	○	○	○	○
Flexibility (Median = 5)	○	○	○	○	○
Knowledge of ethical issues (Median = 4)	○	○	○	○	○
Ability to write a basic grant application (Median = 2)	○	○	○	○	○
Knowledge of budgeting (Median = 2)	○	○	○	○	○
	○	○	○	○	○

Third Round A: Competencies Needed of Entry-Level Academic Health

Political skills (Median = 3)	○	○	○	○	○
Understanding of the controlled vocabulary of health sciences (Median = 3)	○	○	○	○	○
Understanding of basic management and leadership principles (Median = 3)	○	○	○	○	○
Ability to interpret user needs and devise innovative services to meet those needs (Median = 4)	○	○	○	○	○
Knowledge of how medicine "works" (Median = 3)	○	○	○	○	○
Ability to determine and meet the information needs of users (Median = 4)	○	○	○	○	○
Ability to work as a team player with all levels of employees (Median = 5)	○	○	○	○	○
General knowledge of library operations (Median = 3)	○	○	○	○	○
Understanding and application of library management techniques (Median = 4)	○	○	○	○	○
Time management skills (Median = 4)	○	○	○	○	○
Detail-oriented (Median = 4)	○	○	○	○	○
Knowledge of trends in health sciences libraries (Median = 3)	○	○	○	○	○
Knowledge of retrieval systems, including both licensed and open resources (Median = 4)	○	○	○	○	○
Ability to organize quality health information for easy user access (Median = 4)	○	○	○	○	○
Ability to develop, build, and evaluate Web content (Median = 3)	○	○	○	○	○
Knowledge of cataloging and metadata (Median = 3)	○	○	○	○	○
Ability to identify and select quality health information for respective	○	○	○	○	○

Third Round A: Competencies Needed of Entry-Level Academic Health

audiences (health care providers, researchers, students, patients and their families, the lay public) (Median = 4)					
Familiarity with basic medical texts (Median = 3)	○	○	○	○	○
Strong computer and technical skills (Median = 4)	○	○	○	○	○
Written, oral, and web-based communication skills (Median = 4)	○	○	○	○	○

4. Rating of Personal Competencies

Third Round A: Competencies Needed of Entry-Level Academic Health

✱ 2. Please read each personal competency listed below. Look at the median associated with that competency. The median was calculated from the second round data.

Next, please re-rate each competency's importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

For your reference:

Median = the middle number of a set of numbers arranged in numerical order (note: if the number of values in a set is even, then the median is the sum of the two middle values, divided by 2)

	5 - critically important	4 - very important	3 - important	2 - not very important	1 - not important
Focus on quality and quality improvement (Median = 4)	○	○	○	○	○
Personal motivation (Median = 5)	○	○	○	○	○
Inquisitive (Median = 4)	○	○	○	○	○
Effective teaching skills (Median = 4)	○	○	○	○	○
Ability to compromise (Median = 4)	○	○	○	○	○
Ability to focus (Median = 4)	○	○	○	○	○
Excellence (Median = 4)	○	○	○	○	○
Professional demeanor (Median = 5)	○	○	○	○	○
Self-motivated (Median = 5)	○	○	○	○	○
Recognition that there's always something to learn (Median = 5)	○	○	○	○	○
Willing to go above and beyond (Median = 4)	○	○	○	○	○
Innovative (Median = 4)	○	○	○	○	○
Desire to help (Median = 4)	○	○	○	○	○
Ability to see the big picture as well as the little details (Median = 4)	○	○	○	○	○
Patient (Median = 4)	○	○	○	○	○
Desire to learn (Median = 5)	○	○	○	○	○
Ability to understand users'	○	○	○	○	○

behavior and needs (Median = 4)	○	○	○	○	○
Strong interpersonal skills (Median = 5)	○	○	○	○	○
Passion and enthusiasm for the profession (Median = 5)	○	○	○	○	○
Collegiality (Median = 4)	○	○	○	○	○
Desire to do best (Median = 5)	○	○	○	○	○
Potential to assume leadership responsibility (Median = 3)	○	○	○	○	○
Respect for confidentiality (Median = 5)	○	○	○	○	○
Helpful (Median = 4)	○	○	○	○	○
Initiative (Median = 5)	○	○	○	○	○
Positive attitude (Median = 5)	○	○	○	○	○
Willing to share ideas and suggestions (Median = 5)	○	○	○	○	○
Self-confidence (Median = 4)	○	○	○	○	○
Intellectual curiosity (Median = 5)	○	○	○	○	○
Creativity (Median = 4)	○	○	○	○	○
Desire to achieve (Median = 4)	○	○	○	○	○
Accountability (Median = 5)	○	○	○	○	○
Ambition for self-improvement and growth (Median = 5)	○	○	○	○	○
Not easily offended (Median = 4)	○	○	○	○	○
Integrity (Median = 5)	○	○	○	○	○
Interest in lifelong learning and professional development (Median = 5)	○	○	○	○	○
Team player (Median = 5)	○	○	○	○	○
Sense of humor (Median = 4)	○	○	○	○	○
Tactfulness (Median = 4)	○	○	○	○	○
Ability to cope with change (Median = 5)	○	○	○	○	○
Self-starter (Median = 4)	○	○	○	○	○
Eagerness (Median = 4)	○	○	○	○	○

Third Round A: Competencies Needed of Entry-Level Academic Health

Open-minded (Median = 5)	○	○	○	○	○
Stamina (Median = 4)	○	○	○	○	○
Generous in spirit (Median = 3)	○	○	○	○	○
Effective computer, computing and other technical skills (Median = 4)	○	○	○	○	○
Organizational/project management skills (Median = 4)	○	○	○	○	○
Service-orientation (Median = 4)	○	○	○	○	○
Outgoing (Median = 4)	○	○	○	○	○
Tolerance of disagreements or differences (Median = 4)	○	○	○	○	○
Ability to work well with users and colleagues, individually or in teams (Median = 5)	○	○	○	○	○
Ability to take risks (Median = 4)	○	○	○	○	○
Flexibility (Median = 5)	○	○	○	○	○
Analytic or problem-solving skills (Median = 5)	○	○	○	○	○
Perseverance (Median = 4)	○	○	○	○	○
Ability to learn new skills quickly (Median = 4)	○	○	○	○	○
Appreciation of diversity (Median = 4)	○	○	○	○	○
Volunteer attitude (Median = 3)	○	○	○	○	○
Professional engagement (Median = 4)	○	○	○	○	○
Acceptance of other people's differences (Median = 4)	○	○	○	○	○
Self-direction (Median = 5)	○	○	○	○	○
Balance (Median = 3)	○	○	○	○	○
Entrepreneurial skills (Median = 3)	○	○	○	○	○
Ability to think strategically (Median = 4)	○	○	○	○	○
Personable (Median = 4)	○	○	○	○	○
Ability and interest in networking	○	○	○	○	○

Third Round A: Competencies Needed of Entry-Level Academic Health

(Median = 4)					
Well-rounded (Median = 4)	○	○	○	○	○
Ability to face conflict successfully (Median = 4)	○	○	○	○	○
Ability to learn from mistakes (Median = 4)	○	○	○	○	○
Professional ethics (Median = 5)	○	○	○	○	○
Comfortable with ambiguity (Median = 5)	○	○	○	○	○
Ability to offer constructive criticism (Median = 4)	○	○	○	○	○
Vision (Median = 4)	○	○	○	○	○
Ability to quickly determine the most efficient way to solve problems (Median = 4)	○	○	○	○	○
Basic supervision skills (Median = 2)	○	○	○	○	○
Listening skills (Median = 5)	○	○	○	○	○
Hopefulness (Median = 4)	○	○	○	○	○
Ability to laugh at self (Median = 4)	○	○	○	○	○
Enthusiasm (Median = 4)	○	○	○	○	○
Optimist (Median = 4)	○	○	○	○	○
Friendly (Median = 3)	○	○	○	○	○
Pays attention to details (Median = 4)	○	○	○	○	○
Honesty (Median = 5)	○	○	○	○	○
Willingness to pilot new projects (Median = 4)	○	○	○	○	○
Values contributions to the profession (Median = 3)	○	○	○	○	○
Understanding of basic world knowledge (Median = 3)	○	○	○	○	○
Respect for others (Median = 5)	○	○	○	○	○
Ethical values (Median = 5)	○	○	○	○	○
Strong communication skills, both written and verbal (Median = 5)	○	○	○	○	○

Third Round A: Competencies Needed of Entry-Level Academic Health

Non-judgmental (Median = 4)	◯	◯	◯	◯	◯
Organized (Median = 4)	◯	◯	◯	◯	◯
Ability to learn independently (Median = 5)	◯	◯	◯	◯	◯
Command of web-development tools and strategies (Median = 3)	◯	◯	◯	◯	◯
Embraces new things (Median = 4)	◯	◯	◯	◯	◯

5. End

Thank you for your participation!

APPENDIX K

ROUND 3 QUESTIONNAIRE – LIS EDUCATORS

Third Round B: Competencies Needed of Entry-Level Academic Health

1. Informed Consent Notice

My name is Jodi Philbrick, and I am a doctoral candidate in the Interdisciplinary Ph.D. Program in Information Science at the University of North Texas (UNT). I am conducting an online Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians." A Delphi study engages experts to participate, jointly but anonymously, in analyzing a problem. Based on your record in the field of academic health sciences librarianship, you have been selected as an expert for this Delphi study. The problem to be examined is the lack of knowledge of the professional and personal competencies needed of entry-level academic health sciences librarians.

There will be four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software. It is anticipated that the questionnaire for each round will take you approximately 15 minutes to complete. Your participation in this study may help us learn more about the professional and personal competencies needed of entry-level academic health sciences librarians.

Participation in this study is completely voluntary. There are no foreseeable risks involved in this study; however, if you decide to withdraw your participation you may do so at any time by simply leaving the study.

All research records will be kept confidential by the Principal Investigator, and no individual responses will be released as reporting will be done on a group basis. If you have any questions about the study, please contact Jodi Philbrick at ███ ████ or the faculty advisor, Dr. Ana D. Cleveland, UNT Department of Library and Information Sciences at 940-565-2445.

This research project has been reviewed and approved by the UNT Institutional Review Board. Please contact the UNT IRB at 940-565-3940 with any questions regarding your rights as a research subject.

If you agree to participate, you may print this document for your records.

By completing this survey, you are giving your informed consent to participate in this study.

2. Begin

Thank you for completing the first and second rounds of Delphi study to determine the professional and personal competencies needed of entry-level academic health sciences librarians.

In this third round of the Delphi study, you will be re-rating the importance of the professional and personal competencies identified in the first round to reach consensus on the importance of these items.

3. Rating of Professional Competencies

Third Round B: Competencies Needed of Entry-Level Academic Health

* 1. Please read each professional competency listed below. Look at the median associated with that competency. The median was calculated from the second round data.

Next, please re-rate each competency's importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

For your reference:

Median = the middle number of a set of numbers arranged in numerical order (note: if the number of values in a set is even, then the median is the sum of the two middle values, divided by 2)

	5 - critically important	4 - very important	3 - important	2 - not very important	1 - not important
Curiosity (Median = 4.5)	◯	◯	◯	◯	◯
Ability to relate research to clinical care and the community (Median = 3.5)	◯	◯	◯	◯	◯
Basic knowledge of public services (Median = 4)	◯	◯	◯	◯	◯
Basic knowledge of technical services (Median = 3)	◯	◯	◯	◯	◯
Willingness to be a team player or collaborator (Median = 5)	◯	◯	◯	◯	◯
Strong oral and written communication skills (Median = 5)	◯	◯	◯	◯	◯
Basic understanding of the theoretical and practical foundations of our field (Median = 3.5)	◯	◯	◯	◯	◯
Web site creation skills (Median = 3)	◯	◯	◯	◯	◯
Understanding of the cultural infrastructure of universities and health care (Median = 4.5)	◯	◯	◯	◯	◯
Understanding of professional context of medicine (Median = 4)	◯	◯	◯	◯	◯
Knowledge of health information sources and services (Median = 5)	◯	◯	◯	◯	◯
	◯	◯	◯	◯	◯

Third Round B: Competencies Needed of Entry-Level Academic Health

Knowledge of bioinformatics (Median = 3)	○	○	○	○	○
Understanding of informatics, both academic and applied (Median = 4)	○	○	○	○	○
Professional attitude and outlook (Median = 5)	○	○	○	○	○
Basic understanding of fiscal management (Median = 3)	○	○	○	○	○
Knowledge of medical terminology (Median = 4.5)	○	○	○	○	○
Ability to be a good fit with existing group of colleagues (Median = 4)	○	○	○	○	○
Knowledge of basic legal and ethical principles (Median = 4)	○	○	○	○	○
Problem-solving skills (Median = 5)	○	○	○	○	○
Ability to network with other health care librarians (Median = 4)	○	○	○	○	○
Ability to think outside the walls of the library (Median = 4)	○	○	○	○	○
Collection development and management skills (Median = 3.5)	○	○	○	○	○
Proficient in using Microsoft Office products (Median = 4)	○	○	○	○	○
Ability to learn quickly (Median = 5)	○	○	○	○	○
Critical thinking skills (Median = 5)	○	○	○	○	○
Understanding of evidence-based medicine (Median = 4)	○	○	○	○	○
Ability to network with administrators (Median = 4)	○	○	○	○	○
Understanding of the scholarly publishing process (Median = 4)	○	○	○	○	○
Ability to work with people on different committees (Median = 5)	○	○	○	○	○
Creativity (Median = 5)	○	○	○	○	○
Understanding of the credentialing processes for health professionals	○	○	○	○	○

Third Round B: Competencies Needed of Entry-Level Academic Health

(Median = 3.5)					
Information retrieval skills (Median = 5)	○	○	○	○	○
Understanding the structure of complex bibliographic databases (Median = 4)	○	○	○	○	○
Understanding of professional roles and issues (Median = 4)	○	○	○	○	○
Understanding of systems analysis and systems thinking (Median = 3.5)	○	○	○	○	○
Understanding of the technology issues in an electronic environment, such as privacy and security (Median = 4)	○	○	○	○	○
Professional integrity and ethics (Median = 5)	○	○	○	○	○
Professionalism (Median = 5)	○	○	○	○	○
Knowledge of how the library is positioned within a health sciences or healthcare institution (Median = 5)	○	○	○	○	○
Understanding of the current health care environment (Median = 4.5)	○	○	○	○	○
Ability to advocate (Median = 4)	○	○	○	○	○
Outreach skills (Median = 4)	○	○	○	○	○
Strong interpersonal skills, both with clients and staff (Median = 5)	○	○	○	○	○
Instructional skills (Median = 4)	○	○	○	○	○
Knowledge of serials acquisition and management (Median = 3)	○	○	○	○	○
Knowledge of biostatistics/epidemiology (Median = 2.5)	○	○	○	○	○
Understanding of the basic concepts of health care administration (Median = 4)	○	○	○	○	○
Ability and willingness to acquire domain knowledge as required (Median = 5)	○	○	○	○	○

Third Round B: Competencies Needed of Entry-Level Academic Health

Basic knowledge of the health care professions (Median = 5)	○	○	○	○	○
Knowledge of the information needs of health care professionals (Median = 5)	○	○	○	○	○
Understanding of current telecommunications and information technologies (Median = 4)	○	○	○	○	○
Understanding of bibliographic control (Median = 4)	○	○	○	○	○
Knowledge of data mining (Median = 3)	○	○	○	○	○
Marketing research and application skills (Median = 3.5)	○	○	○	○	○
Understanding of advanced knowledge management systems (Median = 3)	○	○	○	○	○
Ability to plan, execute, and publish results from a simple scholarly research project (Median = 4)	○	○	○	○	○
Lifelong learning skills (Median = 5)	○	○	○	○	○
Basic understanding of management principles (Median = 3)	○	○	○	○	○
Ability to plan your own professional development (Median = 4)	○	○	○	○	○
Understanding of the principles of data, information & knowledge organization (Median = 4)	○	○	○	○	○
Active listening skills (Median = 5)	○	○	○	○	○
Ability to keep up-to-date with new information in the field (Median = 5)	○	○	○	○	○
Professional demeanor (Median = 4)	○	○	○	○	○
MEDLINE search skills (Median = 5)	○	○	○	○	○
Knowledge of all the competencies required for ALA-accredited LIS master's programs (Median = 4)	○	○	○	○	○

Third Round B: Competencies Needed of Entry-Level Academic Health

4. Rating of Personal Competencies

* 2. Please read each personal competency listed below. Look at the median associated with that competency. The median was calculated from the second round data.

Next, please re-rate each competency's importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

For your reference:

Median = the middle number of a set of numbers arranged in numerical order (note: if the number of values in a set is even, then the median is the sum of the two middle values, divided by 2)

	5 - critically important	4 - very important	3 - important	2 - not very important	1 - not important
Pleasant demeanor (Median = 3.5)	○	○	○	○	○
Intelligence (Median = 5)	○	○	○	○	○
Willingness to learn (Median = 5)	○	○	○	○	○
Friendliness (Median = 3.5)	○	○	○	○	○
Curiosity (Median = 5)	○	○	○	○	○
Initiative (Median = 5)	○	○	○	○	○
Strong motivation for lifelong learning (Median = 5)	○	○	○	○	○
Belief in ethical professional practice (Median = 5)	○	○	○	○	○
Empathy (Median = 4)	○	○	○	○	○
Emotional intelligence (Median = 5)	○	○	○	○	○
Persistence (Median = 4)	○	○	○	○	○
Tenacity (Median = 4)	○	○	○	○	○
Critical thinker (Median = 5)	○	○	○	○	○
Professionalism (Median = 5)	○	○	○	○	○
Independent thinker (Median = 4.5)	○	○	○	○	○
Ambition (Median = 4)	○	○	○	○	○
Self-motivated (Median = 5)	○	○	○	○	○
	○	○	○	○	○

Third Round B: Competencies Needed of Entry-Level Academic Health

Analytical ability (Median = 5)	○	○	○	○	○
Grace under pressure (Median = 4.5)	○	○	○	○	○
Diligence (Median = 4.5)	○	○	○	○	○
Comfortable getting out of the library and working on other committees (Median = 4.5)	○	○	○	○	○
Professional passion (Median = 5)	○	○	○	○	○
Passion (Median = 5)	○	○	○	○	○
Enthusiasm (Median = 5)	○	○	○	○	○
Desire to assist others (Median = 4.5)	○	○	○	○	○
Maturity (Median = 4)	○	○	○	○	○
Ability to multi-task (Median = 4.5)	○	○	○	○	○
Resilience (Median = 4.5)	○	○	○	○	○
Ability to communicate effectively (Median = 5)	○	○	○	○	○
Sense of humor (Median = 3.5)	○	○	○	○	○
Willingness to take creative risks (Median = 4)	○	○	○	○	○
Team player (Median = 5)	○	○	○	○	○
Flexibility (Median = 5)	○	○	○	○	○
Commitment to cooperate with professionals, inside and outside of library and information sciences (Median = 5)	○	○	○	○	○
Assertiveness (Median = 3.5)	○	○	○	○	○
Efficient time management (Median = 4.5)	○	○	○	○	○
Ability to embrace and adapt to change (Median = 5)	○	○	○	○	○
General interest in people (Median = 5)	○	○	○	○	○
Strong intellect (Median = 5)	○	○	○	○	○
Wanting to make a difference (Median = 4)	○	○	○	○	○
Interpersonal skills (Median = 5)	○	○	○	○	○
	○	○	○	○	○

Third Round B: Competencies Needed of Entry-Level Academic Health

Political intelligence (Median = 4)	○	○	○	○	○
Embrace and encourage diversity (Median = 4.5)	○	○	○	○	○
Creativity (Median = 4)	○	○	○	○	○
Professionally active (Median = 4)	○	○	○	○	○
Sense of responsibility (Median = 5)	○	○	○	○	○
Commitment to evidence-based practice (Median = 4)	○	○	○	○	○
Value service (Median = 5)	○	○	○	○	○
Confidence (Median = 4.5)	○	○	○	○	○
General interest in the profession (Median = 5)	○	○	○	○	○
Collaborative (Median = 4.5)	○	○	○	○	○
Ability to see the big picture (Median = 4.5)	○	○	○	○	○
Eye for vision and mission (Median = 4)	○	○	○	○	○
Ability to fit into an existing group of colleagues (Median = 4.5)	○	○	○	○	○
Personal integrity (Median = 5)	○	○	○	○	○
Dedication (Median = 4)	○	○	○	○	○
Ability to deal with "high-powered" clientele (Median = 4.5)	○	○	○	○	○

5. End

Thank you for your participation!

APPENDIX L

ROUND 3 QUESTIONNAIRE – LIS ADJUNCT FACULTY/HEALTH SCIENCES

LIBRARIANSHIP PRACTITIONERS

Third Round C: Competencies Needed of Entry-Level Academic Health

1. Informed Consent Notice

My name is Jodi Philbrick, and I am a doctoral candidate in the Interdisciplinary Ph.D. Program in Information Science at the University of North Texas (UNT). I am conducting an online Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians." A Delphi study engages experts to participate, jointly but anonymously, in analyzing a problem. Based on your record in the field of academic health sciences librarianship, you have been selected as an expert for this Delphi study. The problem to be examined is the lack of knowledge of the professional and personal competencies needed of entry-level academic health sciences librarians.

There will be four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software. It is anticipated that the questionnaire for each round will take you approximately 15 minutes to complete. Your participation in this study may help us learn more about the professional and personal competencies needed of entry-level academic health sciences librarians.

Participation in this study is completely voluntary. There are no foreseeable risks involved in this study; however, if you decide to withdraw your participation you may do so at any time by simply leaving the study.

All research records will be kept confidential by the Principal Investigator, and no individual responses will be released as reporting will be done on a group basis. If you have any questions about the study, please contact Jodi Philbrick at ▮▮▮▮▮ or the faculty advisor, Dr. Ana D. Cleveland, UNT Department of Library and Information Sciences at 940-565-2445.

This research project has been reviewed and approved by the UNT Institutional Review Board. Please contact the UNT IRB at 940-565-3940 with any questions regarding your rights as a research subject.

If you agree to participate, you may print this document for your records.

By completing this survey, you are giving your informed consent to participate in this study.

2. Begin

Thank you for completing the first and second rounds of Delphi study to determine the professional and personal competencies needed of entry-level academic health sciences librarians.

In this third round of the Delphi study, you will be re-rating the importance of the professional and personal competencies identified in the first round to reach consensus on the importance of these items.

3. Rating of Professional Competencies

Third Round C: Competencies Needed of Entry-Level Academic Health

* 1. Please read each professional competency listed below. Look at the median associated with that competency. The median was calculated from the second round data.

Next, please re-rate each competency's importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

For your reference:

Median = the middle number of a set of numbers arranged in numerical order (note: if the number of values in a set is even, then the median is the sum of the two middle values, divided by 2)

	5 - critically important	4 - very important	3 - important	2 - not very important	1 - not important
Ability to apply theory (Median = 3)	○	○	○	○	○
Medical literature searching skills (Median = 4)	○	○	○	○	○
Resilience in attitude toward receiving feedback and expecting that most innovation faces initial resistance (Median = 4)	○	○	○	○	○
Competence with functional and theoretical application of citation management tools (Median = 4)	○	○	○	○	○
Knowledge about health sciences environment and trends (Median = 3.5)	○	○	○	○	○
Knowledge of information ethics and health care ethical issues (Median = 4)	○	○	○	○	○
Project management skills (Median = 4.5)	○	○	○	○	○
Strong knowledge of US health care education, especially the Accreditation Council for Graduate Medical Education (ACGME) core competencies (Median = 3.5)	○	○	○	○	○
Knowledge of the American Library Association (ALA) Code of	○	○	○	○	○

Third Round C: Competencies Needed of Entry-Level Academic Health

Ethics (Median = 3)					
Knowledge about health sciences librarianship (Median = 4)	○	○	○	○	○
Strong knowledge of the health sciences literature, including print and electronic resources (Median = 4)	○	○	○	○	○
Database searching skills (Median = 5)	○	○	○	○	○
Ability to recognize that academic health sciences librarianship requires more than 9-5 M-F commitment (Median = 4)	○	○	○	○	○
Understanding of information needs in the health sciences (Median = 4)	○	○	○	○	○
Interpersonal skills (Median = 5)	○	○	○	○	○
Ability to match health information needs with available information resources (Median = 4)	○	○	○	○	○
Ability to innovate (Median = 4)	○	○	○	○	○
Advanced computer skills (Median = 3)	○	○	○	○	○
Ability to build Web documents, including blogs, libguides, and other non-programming interfaces (Median = 4)	○	○	○	○	○
Proficiency with and interest in current and emerging information technologies (Median = 4.5)	○	○	○	○	○
Understanding of data organization, including the Medical Subject Headings (MeSH) (Median = 5)	○	○	○	○	○
Analytical skills (Median = 4)	○	○	○	○	○
Ability to evaluate the various users in a health setting (Median = 3.5)	○	○	○	○	○
Basic information management skills (Median = 4)	○	○	○	○	○
	○	○	○	○	○

Third Round C: Competencies Needed of Entry-Level Academic Health

Ability to critically assess clinical research articles (Median = 4)	○	○	○	○	○
Familiarity with Web design and usage (Median = 3.5)	○	○	○	○	○
Vision (Median = 3.5)	○	○	○	○	○
Understanding of scholarly communication, including copyright and open access (Median = 3.5)	○	○	○	○	○
Ability to work under pressure (Median = 4)	○	○	○	○	○
Commitment to life-long learning, both knowledge and skill development (Median = 4)	○	○	○	○	○
Basic reference skills, including interviewing, retrieval, and evaluation (Median = 4)	○	○	○	○	○
Understanding of subject headings and metadata tags used in health care (Median = 4.5)	○	○	○	○	○
Mastery of English language competence required in a US academic health sciences campus (Median = 4)	○	○	○	○	○
Understanding of basic descriptive and inferential statistics (Median = 3)	○	○	○	○	○
Oral and written communication skills (Median = 4)	○	○	○	○	○
Understanding of database design and management (Median = 3.5)	○	○	○	○	○
Teaching and instructional design skills, including knowledge of pedagogy (Median = 4)	○	○	○	○	○
Competence and skill in team-based collaborative activities (Median = 4)	○	○	○	○	○
Knowledge and competence in social and cultural diversity (Median = 4)	○	○	○	○	○
Knowledge and competence in library acquisition, including preparation to adapt to	○	○	○	○	○

local purchasing conventions (Median = 3)					
Understanding of evidence-based medicine (Median = 4)	◯	◯	◯	◯	◯
Common sense (Median = 5)	◯	◯	◯	◯	◯
Familiarity with research methods and design (Median = 4)	◯	◯	◯	◯	◯
Understanding of the importance of immediacy in health care and ability to react quickly (Median = 4.5)	◯	◯	◯	◯	◯
Theoretical and practical understanding of RSS, both for tracking emerging knowledge and building self-updating web pages (Median = 3.5)	◯	◯	◯	◯	◯
Dedication (Median = 4.5)	◯	◯	◯	◯	◯
Knowledge of customer service standards for information professionals in the health care and research enterprise (Median = 4)	◯	◯	◯	◯	◯
Commitment to being a librarian (Median = 4.5)	◯	◯	◯	◯	◯

4. Rating of Personal Competencies

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Third Round C: Competencies Needed of Entry-Level Academic Health

* 2. Please read each personal competency listed below. Look at the median associated with that competency. The median was calculated from the second round data.

Next, please re-rate each competency's importance for an entry-level academic health sciences librarian using the scale from 5 to 1, where 5 is critically important and 1 is not important.

For your reference:

Median = the middle number of a set of numbers arranged in numerical order (note: if the number of values in a set is even, then the median is the sum of the two middle values, divided by 2)

	5 - critically important	4 - very important	3 - important	2 - not very important	1 - not important
Teaching skills (Median = 4)	○	○	○	○	○
Seeks opportunities to be involved (Median = 4)	○	○	○	○	○
Fiscally aware (Median = 3)	○	○	○	○	○
Emotional intelligence (Median = 4)	○	○	○	○	○
Commitment to serve (Median = 4)	○	○	○	○	○
Humility; ability to be wrong and admit it (Median = 4)	○	○	○	○	○
Generosity (Median = 3)	○	○	○	○	○
Ability to work with others in a collegial and professional manner (Median = 4)	○	○	○	○	○
Repays debts of gratitude in a variety of ways (Median = 3)	○	○	○	○	○
Proactive (Median = 4.5)	○	○	○	○	○
Ability to adapt to change (Median = 5)	○	○	○	○	○
Pursues a work/life balance that is sustainable (Median = 3)	○	○	○	○	○
Team player (Median = 4)	○	○	○	○	○
Flexibility (Median = 4.5)	○	○	○	○	○
Analytical (Median = 4)	○	○	○	○	○
Understands and honors confidentiality	○	○	○	○	○

Third Round C: Competencies Needed of Entry-Level Academic Health

(Median = 5)

Application of knowledge (Median = 4)	○	○	○	○	○
Knowledge of medical terminology, such as MeSH (Median = 4)	○	○	○	○	○
Understanding of American Library Association Code of Ethics (Median = 3)	○	○	○	○	○
Ability to improve services (Median = 4)	○	○	○	○	○
Background in the sciences (Median = 3)	○	○	○	○	○
Loyalty (Median = 3)	○	○	○	○	○
Strong sense of own integrity (Median = 4.5)	○	○	○	○	○
Professional attitude (Median = 4)	○	○	○	○	○
Ability to take risks (Median = 4)	○	○	○	○	○
Continuous learner; is able to keep up with changing environment (Median = 4.5)	○	○	○	○	○
Sense of humor (Median = 4)	○	○	○	○	○
Curiosity (Median = 4)	○	○	○	○	○
Appreciation of various cultural/professional contexts (Median = 4)	○	○	○	○	○
Doggedness; never gives up (Median = 3)	○	○	○	○	○
Interested in other people (Median = 4)	○	○	○	○	○
Communication skills (Median = 4)	○	○	○	○	○
Self-confident (Median = 4)	○	○	○	○	○
Collaborative orientation (Median = 4.5)	○	○	○	○	○
Leadership skills (Median = 3)	○	○	○	○	○
Interest in working in interprofessional teams (Median = 4)	○	○	○	○	○
Knowledge of important databases, such as CINAHL (Median = 4)	○	○	○	○	○
Innovator (Median = 3)	○	○	○	○	○
Service oriented (Median = 4)	○	○	○	○	○

Third Round C: Competencies Needed of Entry-Level Academic Health

Seeks positive solutions (Median = 4.5)	◯	◯	◯	◯	◯
Self-aware (Median = 4)	◯	◯	◯	◯	◯
Communicator (Median = 4)	◯	◯	◯	◯	◯
Community-centered; genuinely desires consensus and harmony (Median = 4)	◯	◯	◯	◯	◯
Self-motivated (Median = 5)	◯	◯	◯	◯	◯
Creativity (Median = 4)	◯	◯	◯	◯	◯
Intelligent (Median = 4.5)	◯	◯	◯	◯	◯
Social vision; looks right at customers and colleagues (Median = 3.5)	◯	◯	◯	◯	◯
Respect (Median = 4)	◯	◯	◯	◯	◯
Basic technical service skills (Median = 3)	◯	◯	◯	◯	◯
Ability to work independently, requesting appropriate input/guidance when needed (Median = 4)	◯	◯	◯	◯	◯
Positive (Median = 4)	◯	◯	◯	◯	◯
Attention to detail (Median = 4)	◯	◯	◯	◯	◯
Ability to deal with fluid boundaries of field-- not set in what libraries or librarians do (Median = 4)	◯	◯	◯	◯	◯
Basic reference skills (Median = 4)	◯	◯	◯	◯	◯
Enthusiasm for new information technologies (Median = 4)	◯	◯	◯	◯	◯
Organized (Median = 3.5)	◯	◯	◯	◯	◯
Outreach skills (Median = 4)	◯	◯	◯	◯	◯
Ethical (Median = 5)	◯	◯	◯	◯	◯
Commitment to ongoing professional development (Median = 4)	◯	◯	◯	◯	◯
Course development skills (Median = 3)	◯	◯	◯	◯	◯
Self-learner (Median = 5)	◯	◯	◯	◯	◯
Time management skills (Median = 4)	◯	◯	◯	◯	◯
	◯	◯	◯	◯	◯

Personality (Median = 3)	○	○	○	○	○
Searching skills for Medline in any format (Median = 4)	○	○	○	○	○
Ability to identify and evaluate possible solutions to problems/barriers (Median = 4)	○	○	○	○	○

5. End

Thank you for your participation!

APPENDIX M

ROUND 4 QUESTIONNAIRE

Fourth Round - Competencies Needed of Entry-Level Academic Health

1. Informed Consent Notice

My name is Jodi Philbrick, and I am a doctoral candidate in the Interdisciplinary Ph.D. Program in Information Science at the University of North Texas (UNT). I am conducting an online Delphi study for my dissertation entitled "A Study of the Competencies Needed of Entry-Level Academic Health Sciences Librarians." A Delphi study engages experts to participate, jointly but anonymously, in analyzing a problem. Based on your record in the field of academic health sciences librarianship, you have been selected as an expert for this Delphi study. The problem to be examined is the lack of knowledge of the professional and personal competencies needed of entry-level academic health sciences librarians.

There will be four rounds to this Delphi study, and each round will consist of a questionnaire that you will fill out electronically using SurveyMonkey, online survey software. It is anticipated that the questionnaire for each round will take you approximately 15 minutes to complete. Your participation in this study may help us learn more about the professional and personal competencies needed of entry-level academic health sciences librarians.

Participation in this study is completely voluntary. There are no foreseeable risks involved in this study; however, if you decide to withdraw your participation you may do so at any time by simply leaving the study.

All research records will be kept confidential by the Principal Investigator, and no individual responses will be released as reporting will be done on a group basis. If you have any questions about the study, please contact Jodi Philbrick at ▮▮▮▮ ▮▮▮▮ or the faculty advisor, Dr. Ana D. Cleveland, UNT Department of Library and Information Sciences at 940-565-2445.

This research project has been reviewed and approved by the UNT Institutional Review Board. Please contact the UNT IRB at 940-565-3940 with any questions regarding your rights as a research subject.

If you agree to participate, you may print this document for your records.

By completing this survey, you are giving your informed consent to participate in this study.

2. Begin

Thank you for completing the first, second, and third rounds of the Delphi study to determine the professional and personal competencies needed of entry-level academic health sciences librarians.

In this fourth round of the Delphi study, you will be selecting the listings of the professional and personal competencies that you prefer for an entry-level academic health sciences librarian.

3. Listing of Professional Competencies

✳ 1. Carefully read the three lists of professional competencies (A, B, and C) below, and select the one list you prefer for entry-level academic health sciences librarians.

◯ **Professional Competencies List A:**

Ability to conduct research in librarianship

Ability to design information systems for delivering scholarly information to users

Ability to determine and meet the information needs of users

Ability to develop, build, and evaluate Web content

Ability to effectively teach library users

Ability to engage users and colleagues about issues addressing organization and delivery topics

Ability to identify and select quality health information for respective audiences (health care providers, researchers, students, patients and their families, the lay public)

Ability to integrate into the institutional community

Ability to interpret user needs and devise innovative services to meet those needs

Ability to organize content and structure records

Ability to organize quality health information for easy user access

Ability to plan and evaluate library services, resources, staff and report specific outcomes

Ability to read and understand basic medical articles

Ability to retrieve, assess, and articulate information

Ability to understand complex concepts and translate them into instruction

Ability to use technology to enhance job responsibilities

Ability to work alone and as part of a team

Ability to work as a team player with all levels of employees

Awareness of current issues in scholarly publishing

Basic understanding of translational medicine cycle

Fourth Round - Competencies Needed of Entry-Level Academic Health

Basics of learning and keeping up-to-date on databases

Conversant with intellectual property law and history

Creativity

Detail-oriented

Emotional intelligence

Excellent interpersonal skills

Expert searching skills

Familiarity with basic medical texts

Familiarity with social networking tools

Flexibility

General knowledge of academic health center operations

General knowledge of library operations

Inquisitive nature

Knowledge and ability to do data analysis

Knowledge and appreciation of medical informatics principles and best practices

Knowledge of and use of current, new, and emerging technologies having an impact on services/resources

Knowledge of cataloging and metadata

Knowledge of database searching basics

Knowledge of database structure

Knowledge of ethical issues

Knowledge of health information literacy

Knowledge of health sciences subject matter

Knowledge of how medicine "works"

Fourth Round - Competencies Needed of Entry-Level Academic Health

Knowledge of issues and trends in health sciences environment

Knowledge of legal and policy issues, such as copyright

Knowledge of medical terminology

Knowledge of PubMed

Knowledge of retrieval systems, including both licensed and open resources

Knowledge of the health sciences culture

Knowledge of the structure and nature of information, especially in the health sciences

Knowledge of trends in health sciences libraries

Knowledge of Web design principles

Knowledge of Web-based information delivery, including Web 2.0/3.0 tools

Learning skills

Literature searching skills

Negotiation skills

Networking skills

Open-mindedness

Oral presentation skills

Organizational skills

Organized inquiry skill

Patience

Political skills

Problem-solving and analytical skills

Project management skills

Reference interview skills

Sense of humor

Strong computer and technical skills

Technical (not creative) writing skills

Time management skills

Understanding of basic management and leadership principles

Understanding of research methods

Understanding of scholarly communications systems

Understanding of the controlled vocabulary of health sciences

Understanding of the historical context for libraries

Understanding of the organizational scheme of library resources

Understanding of user information seeking behaviors

Willingness to learn

Written, oral, and web-based communication skills

○ **Professional Competencies List B:**

Ability and willingness to acquire domain knowledge as required

Ability to be a good fit with existing group of colleagues

Ability to keep up-to-date with new information in the field

Ability to learn quickly

Ability to network with other health care librarians

Ability to plan your own professional development

Ability to plan, execute, and publish results from a simple scholarly research project

Ability to relate research to clinical care and the community

Ability to think outside the walls of the library

Ability to work with people on different committees

Fourth Round - Competencies Needed of Entry-Level Academic Health

Active listening skills

Basic knowledge of public services

Basic knowledge of technical services

Basic knowledge of the health care professions

Basic understanding of fiscal management

Basic understanding of management principles

Basic understanding of the theoretical and practical foundations of our field

Collection development and management skills

Creativity

Critical thinking skills

Curiosity

Information retrieval skills

Instructional skills

Knowledge of the information needs of health care professionals

Knowledge of all the competencies required for ALA-accredited LIS master's programs

Knowledge of basic legal and ethical principles

Knowledge of bioinformatics

Knowledge of biostatistics/epidemiology

Knowledge of health information sources and services

Knowledge of how the library is positioned within a health sciences or healthcare institution

Knowledge of medical terminology

Knowledge of serials acquisition and management

Lifelong learning skills

Fourth Round - Competencies Needed of Entry-Level Academic Health

MEDLINE search skills

Outreach skills

Problem-solving skills

Professional attitude and outlook

Professional demeanor

Professional integrity and ethics

Professionalism

Proficient in using Microsoft Office products

Strong interpersonal skills, both with clients and staff

Strong oral and written communication skills

Understanding of bibliographic control

Understanding of current telecommunications and information technologies

Understanding of evidence-based medicine

Understanding of informatics, both academic and applied

Understanding of professional context of medicine

Understanding of professional roles and issues

Understanding of systems analysis and systems thinking

Understanding of the basic concepts of health care administration

Understanding of the credentialing processes for health professionals

Understanding of the cultural infrastructure of universities and health care

Understanding of the current health care environment

Understanding of the principles of data, information & knowledge organization

Understanding of the scholarly publishing process

Fourth Round - Competencies Needed of Entry-Level Academic Health

Understanding of the technology issues in an electronic environment, such as privacy and security

Understanding the structure of complex bibliographic databases

Web site creation skills

Willingness to be a team player or collaborator

◯ **Professional Competencies List C:**

Ability to apply theory

Ability to build Web documents, including blogs, libguides, and other non-programming interfaces

Ability to critically assess clinical research articles

Ability to evaluate the various users in a health setting

Ability to innovate

Ability to match health information needs with available information resources

Ability to recognize that academic health sciences librarianship requires more than 9-5 M-F commitment

Ability to work under pressure

Advanced computer skills

Analytical skills

Basic information management skills

Basic reference skills, including interviewing, retrieval, and evaluation

Commitment to being a librarian

Commitment to life-long learning, both knowledge and skill development

Competence and skill in team-based collaborative activities

Competence with functional and theoretical application of citation management tools

Database searching skills

Dedication

Fourth Round - Competencies Needed of Entry-Level Academic Health

Familiarity with research methods and design

Familiarity with Web design and usage

Interpersonal skills

Knowledge about health sciences environment and trends

Knowledge about health sciences librarianship

Knowledge and competence in library acquisition, including preparation to adapt to local purchasing conventions

Knowledge and competence in social and cultural diversity

Knowledge of the American Library Association (ALA) Code of Ethics

Medical literature searching skills

Oral and written communication skills

Proficiency with and interest in current and emerging information technologies

Project management skills

Resilience in attitude toward receiving feedback and expecting that most innovation faces initial resistance

Strong knowledge of the health sciences literature, including print and electronic resources

Strong knowledge of US health care education, especially the Accreditation Council for Graduate Medical Education (ACGME) core competencies

Teaching and instructional design skills, including knowledge of pedagogy

Theoretical and practical understanding of RSS, both for tracking emerging knowledge and building self-updating web pages

Understanding of basic descriptive and inferential statistics

Understanding of data organization, including the Medical Subject Headings (MeSH)

Understanding of database design and management

Understanding of evidence-based medicine

Understanding of information needs in the health sciences

Understanding of subject headings and metadata tags used in health care

Understanding of the importance of immediacy in health care and ability to react quickly

Vision

4. Listing of Personal Competencies

* 2. Carefully read the three lists of personal competencies (A, B, and C) below, and select the one list you prefer for entry-level academic health sciences librarians.

◯ **Personal Competencies List A:**

Ability and interest in networking

Ability to compromise

Ability to cope with change

Ability to face conflict successfully

Ability to focus

Ability to laugh at self

Ability to learn from mistakes

Ability to learn independently

Ability to learn new skills quickly

Ability to offer constructive criticism

Ability to see the big picture as well as the little details

Ability to take risks

Ability to think strategically

Ability to understand users' behavior and needs

Ability to work well with users and colleagues, individually or in teams

Acceptance of other people's differences

Accountability

Fourth Round - Competencies Needed of Entry-Level Academic Health

Ambition for self-improvement and growth

Analytic or problem-solving skills

Appreciation of diversity

Balance

Collegiality

Comfortable with ambiguity

Command of web-development tools and strategies

Creativity

Desire to achieve

Desire to do best

Desire to help

Desire to learn

Eagerness

Effective computer, computing and other technical skills

Effective teaching skills

Embraces new things

Enthusiasm

Entrepreneurial skills

Ethical values

Excellence

Flexibility

Focus on quality and quality improvement

Friendly

Fourth Round - Competencies Needed of Entry-Level Academic Health

Generous in spirit

Helpful

Honesty

Hopefulness

Initiative

Innovative

Inquisitive

Integrity

Intellectual curiosity

Interest in lifelong learning and professional development

Listening skills

Non-judgmental

Not easily offended

Open-minded

Optimist

Organizational/project management skills

Organized

Outgoing

Passion and enthusiasm for the profession

Patient

Pays attention to details

Perseverance

Personable

Fourth Round - Competencies Needed of Entry-Level Academic Health
Personal motivation
Positive attitude
Potential to assume leadership responsibility
Professional demeanor
Professional engagement
Professional ethics
Recognition that there's always something to learn
Respect for confidentiality
Respect for others
Self-confidence
Self-direction
Self-motivated
Self-starter
Sense of humor
Service-orientation
Strong communication skills, both written and verbal
Strong interpersonal skills
Tactfulness
Team player
Tolerance of disagreements or differences
Understanding of basic world knowledge
Values contributions to the profession
Vision

Volunteer attitude

Well-rounded

Willing to go above and beyond

Willing to share ideas and suggestions

Willingness to pilot new projects

◯ **Personal Competencies List B:**

Ability to communicate effectively

Ability to deal with "high-powered" clientele

Ability to embrace and adapt to change

Ability to fit into an existing group of colleagues

Ability to multi-task

Ability to see the big picture

Ambition

Analytical ability

Belief in ethical professional practice

Collaborative

Comfortable getting out of the library and working on other committees

Commitment to cooperate with professionals, inside and outside of library and information sciences

Creativity

Critical thinker

Curiosity

Dedication

Desire to assist others

Diligence

Fourth Round - Competencies Needed of Entry-Level Academic Health

Efficient time management

Embrace and encourage diversity

Emotional intelligence

Empathy

Enthusiasm

Eye for vision and mission

Flexibility

General interest in people

General interest in the profession

Grace under pressure

Independent thinker

Initiative

Intelligence

Interpersonal skills

Maturity

Passion

Persistence

Personal integrity

Pleasant demeanor

Professional passion

Professionalism

Professionally active

Resilience

Self-motivated

Sense of responsibility

Strong intellect

Strong motivation for lifelong learning

Team player

Tenacity

Value service

Wanting to make a difference

Willingness to learn

◯ **Personal Competencies List C:**

Ability to adapt to change

Ability to deal with fluid boundaries of field-- not set in what libraries or librarians do

Ability to identify and evaluate possible solutions to problems/barriers

Ability to improve services

Ability to take risks

Ability to work independently, requesting appropriate input/guidance when needed

Ability to work with others in a collegial and professional manner

Analytical

Application of knowledge

Appreciation of various cultural/professional contexts

Attention to detail

Background in the sciences

Basic reference skills

Fourth Round - Competencies Needed of Entry-Level Academic Health
Basic technical service skills
Collaborative orientation
Commitment to ongoing professional development
Commitment to serve
Communication skills
Communicator
Community-centered; genuinely desires consensus and harmony
Continuous learner; is able to keep up with changing environment
Course development skills
Creativity
Curiosity
Doggedness; never gives up
Emotional intelligence
Enthusiasm for new information technologies
Ethical
Fiscally aware
Flexibility
Generosity
Humility; ability to be wrong and admit it
Innovator
Intelligent
Interest in working in interprofessional teams
Interested in other people

Fourth Round - Competencies Needed of Entry-Level Academic Health

Knowledge of important databases, such as CINAHL

Knowledge of medical terminology, such as MeSH

Leadership skills

Loyalty

Organized

Outreach skills

Personality

Positive

Proactive

Professional attitude

Pursues a work/life balance that is sustainable

Repays debts of gratitude in a variety of ways

Respect

Searching skills for Medline in any format

Seeks opportunities to be involved

Seeks positive solutions

Self-aware

Self-confident

Self-learner

Self-motivated

Social vision; looks right at customers and colleagues

Strong sense of own integrity

Teaching skills

Fourth Round - Competencies Needed of Entry-Level Academic Health

Team player

Time management skills

Understanding of American Library Association Code of Ethics

Understands and honors confidentiality

5. End

Thank you for participating in the Delphi study to identify the professional and personal competencies needed of entry-level academic health sciences librarians! Your support of the study is very much appreciated.

APPENDIX N

ACADEMIC HEALTH SCIENCES LIBRARY DIRECTORS' ROUND 2 RATINGS OF

PROFESSIONAL COMPETENCIES

Table N.1

Median Scores and Interquartile Ranges of the Professional Competencies Rated by Academic Health Sciences Library Directors in Round 2

Professional Competency	*Mdn*	IQR
Ability to conduct research in librarianship	3	1
Ability to design information systems for delivering scholarly information to users	3	2
Ability to determine and meet the information needs of users	4	1
Ability to develop, build, and evaluate Web content	3	2
Ability to effectively teach library users	4	1
Ability to engage users and colleagues about issues addressing organization and delivery topics	3	1
Ability to identify and select quality health information for respective audiences (health care providers, researchers, students, patients and their families, the lay public)	4	3
Ability to integrate into the institutional community	4	1
Ability to interpret user needs and devise innovative services to meet those needs	4	1
Ability to organize content and structure records	4	1
Ability to organize quality health information for easy user access	4	1
Ability to plan and evaluate library services, resources, staff and report specific outcomes	3	2
Ability to read and understand basic medical articles	3	2
Ability to retrieve, assess, and articulate information	4	1
Ability to understand complex concepts and translate them into instruction	4	1
Ability to use technology to enhance job responsibilities	4	1
Ability to work alone and as part of a team	5	1
Ability to work as a team player with all levels of employees	5	1
Ability to write a basic grant application	2	1
Awareness of current issues in scholarly publishing	3	1
Basic understanding of the 5-step process of evidence-based librarianship	3	1
Basic understanding of translational medicine cycle	3	1
Basics of learning and keeping up-to-date on databases	4	2
Conversant with intellectual property law and history	3	1
Creativity	4	1
Detail-oriented	4	1
Emotional intelligence	5	1
Excellent interpersonal skills	5	0
Expert searching skills	4	2
Familiarity with basic medical texts	3	1
Familiarity with social networking tools	3	1
Financial literacy skills	2	1

(*table continues*)

Table N.1 (*continued*)

Professional Competency	*Mdn*	IQR
Flexibility	5	0
General knowledge of academic health center operations	3	1
General knowledge of library operations	3	0
Inquisitive nature	5	1
Knowledge and ability to do data analysis	2	1
Knowledge and ability to do data mining	2	1
Knowledge and appreciation of medical informatics principles and best practices	3	2
Knowledge of and use of current, new, and emerging technologies having an impact on services/resources	4	1
Knowledge of budgeting	2	1
Knowledge of cataloging and metadata	3	0
Knowledge of database searching basics	4	1
Knowledge of database structure	3	1
Knowledge of ethical issues	4	1
Knowledge of health information literacy	3	1
Knowledge of health sciences information resources and services	4	1
Knowledge of health sciences subject matter	3	1
Knowledge of how medicine "works"	3	1
Knowledge of issues and trends in health sciences environment	4	1
Knowledge of legal and policy issues, such as copyright	3	1
Knowledge of medical terminology	3	2
Knowledge of PubMed	4	1
Knowledge of retrieval systems, including both licensed and open resources	4	1
Knowledge of the health sciences culture	3	1
Knowledge of the history of librarianship	2	1
Knowledge of the structure and nature of information, especially in the health sciences	3	1
Knowledge of trends in health sciences libraries	3	0
Knowledge of Web design principles	3	0
Knowledge of Web-based information delivery, including Web 2.0/3.0 tools	3	1
Learning skills	5	1
Literature searching skills	4	1
Negotiation skills	3	2
Networking skills	5	1
Open-mindedness	5	1
Oral presentation skills	4	1
Organizational skills	5	1
Organized inquiry skill	4	1
Patience	4	1
Political skills	3	1
Problem-solving and analytical skills	5	1

(*table continues*)

Table N.1 (*continued*)

Professional Competency	*Mdn*	IQR
Project management skills	4	2
Reference interview skills	5	2
Science or clinical background	2	2
Sense of humor	4	1
Strong computer and technical skills	4	2
Technical (not creative) writing skills	4	1
Time management skills	4	1
Understanding and application of library management	3	0
Understanding of basic management and leadership principles	3	1
Understanding of research methods	3	1
Understanding of scholarly communications systems	4	1
Understanding of the controlled vocabulary of health sciences	3	1
Understanding of the historical context for libraries	2	1
Understanding of the organizational scheme of library resources	3	1
Understanding of user information seeking behaviors	4	0
Willingness to learn	5	0
Written, oral, and web-based communication skills	4	1

APPENDIX O

ACADEMIC HEALTH SCIENCES LIBRARY DIRECTORS' ROUND 2 RATINGS OF

PERSONAL COMPETENCIES

Table O.1

Median Scores and Interquartile Ranges of the Personal Competencies Rated by Academic Health Sciences Library Directors in Round 2

Personal Competency	*Mdn*	IQR
Ability and interest in networking	4	1
Ability to compromise	4	1
Ability to cope with change	5	1
Ability to face conflict successfully	4	1
Ability to focus	4	1
Ability to laugh at self	4	1
Ability to learn from mistakes	4	1
Ability to learn independently	5	1
Ability to learn new skills quickly	4	1
Ability to offer constructive criticism	4	1
Ability to quickly determine the most efficient way to solve problems	4	1
Ability to see the big picture as well as the little details	4	1
Ability to take risks	4	1
Ability to think strategically	4	1
Ability to understand users' behavior and needs	4	1
Ability to work well with users and colleagues, individually or in teams	5	1
Acceptance of other people's differences	4	2
Accountability	5	1
Ambition for self-improvement and growth	5	1
Analytic or problem-solving skills	5	2
Appreciation of diversity	4	1
Basic supervision skills	2	1
Balance	3	2
Collegiality	4	1
Comfortable with ambiguity	5	1
Command of web-development tools and strategies	3	2
Creativity	4	2
Desire to achieve	4	1
Desire to do best	5	1
Desire to help	4	2
Desire to learn	5	0
Eagerness	4	1
Effective computer, computing and other technical skills	4	2
Effective teaching skills	4	1
Embraces new things	4	1

(*table continues*)

Table O.1 (*continued*).

Personal Competency	*Mdn*	IQR
Enthusiasm	4	1
Entrepreneurial skills	3	1
Ethical values	5	1
Excellence	4	2
Flexibility	5	0
Focus on quality and quality improvement	4	2
Friendly	3	2
Generous in spirit	3	1
Helpful	4	2
Honesty	5	1
Hopefulness	4	1
Initiative	5	1
Innovative	4	1
Inquisitive	4	1
Integrity	5	1
Intellectual curiosity	5	1
Interest in lifelong learning and professional development	5	1
Listening skills	5	1
Non-judgmental	4	1
Not easily offended	4	2
Open-minded	5	1
Optimist	4	1
Organizational/project management skills	4	1
Organized	4	1
Outgoing	4	1
Passion and enthusiasm for the profession	5	1
Patient	4	1
Pays attention to details	4	1
Perseverance	4	1
Personable	4	2
Personal motivation	5	1
Positive attitude	5	1
Potential to assume leadership responsibility	3	0
Professional demeanor	5	1
Professional engagement	4	2
Professional ethics	5	2
Recognition that there's always something to learn	5	1
Respect for confidentiality	5	0
Respect for others	5	0

(*table continues*)

Table O.1 (*continued*)

Personal Competency	*Mdn*	IQR
Self-confidence	4	1
Self-direction	5	1
Self-motivated	5	1
Self-starter	4	1
Sense of humor	4	1
Service-orientation	4	1
Stamina	4	1
Strong communication skills, both written and verbal	5	0
Strong interpersonal skills	5	1
Tactfulness	4	2
Team player	5	1
Tolerance of disagreements or differences	4	1
Understanding of basic world knowledge	3	0
Values contributions to the profession	3	1
Vision	4	1
Volunteer attitude	3	2
Well-rounded	4	2
Willing to go above and beyond	4	2
Willing to share ideas and suggestions	5	1
Willingness to pilot new projects	4	1

APPENDIX P

LIS EDUCATORS' ROUND 2 RATINGS OF PROFESSIONAL COMPETENCIES

Table P.1

Median Scores and Interquartile Ranges of the Professional Competencies Rated by the LIS Educators in Round 2

Professional Competency	*Mdn*	IQR
Ability and willingness to acquire domain knowledge as required	5	1
Ability to advocate	4	1.5
Ability to be a good fit with existing group of colleagues	4	2
Ability to keep up-to-date with new information in the field	5	0
Ability to learn quickly	5	0.5
Ability to network with administrators	4	1
Ability to network with other health care librarians	4	1
Ability to plan your own professional development	4	1.5
Ability to plan, execute, and publish results from a simple scholarly research project	4	1.5
Ability to relate research to clinical care and the community	3.5	1.5
Ability to think outside the walls of the library	5	0.5
Ability to work with people on different committees	5	1
Active listening skills	5	0.5
Basic knowledge of public services	4	1
Basic knowledge of technical services	3	1.5
Basic knowledge of the health care professions	5	1.5
Basic understanding of fiscal management	3	0.5
Basic understanding of management principles	3	1
Basic understanding of the theoretical and practical foundations of our field	3.5	2
Collection development and management skills	3.5	1.5
Creativity	5	1.5
Critical thinking skills	5	0
Curiosity	4.5	1
Information retrieval skills	5	1
Instructional skills	4	1
Knowledge of all the competencies required for ALA-accredited LIS master's programs	4	1.5
Knowledge of basic legal and ethical principles	4	1
Knowledge of bioinformatics	3	2
Knowledge of biostatistics/epidemiology	2.5	2
Knowledge of data mining	3	1.5
Knowledge of health information sources and services	5	1.5
Knowledge of how the library is positioned within a health sciences or healthcare institution	5	1
Knowledge of medical terminology	4.5	1.5
Knowledge of serials acquisition and management	3	1
Knowledge of the information needs of health care professionals	5	1.5
Lifelong learning skills	5	1

(*table continues*)

Table P.1 (*continued*).

Professional Competency	*Mdn*	IQR
Marketing research and application skills	3.5	1
MEDLINE search skills	5	1
Outreach skills	4	1
Problem-solving skills	5	1
Professional attitude and outlook	5	0.5
Professional demeanor	4	1.5
Professional integrity and ethics	5	0
Professionalism	5	0
Proficient in using Microsoft Office products	4	1
Strong interpersonal skills, both with clients and staff	5	0
Strong oral and written communication skills	5	0
Understanding of advanced knowledge management systems	3	1
Understanding of bibliographic control	4	1
Understanding of current telecommunications and information technologies	4	0.5
Understanding of evidence-based medicine	4	1.5
Understanding of informatics, both academic and applied	4	1
Understanding of professional context of medicine	4	2
Understanding of professional roles and issues	4	1.5
Understanding of systems analysis and systems thinking	3.5	1
Understanding of the basic concepts of health care administration	4	1.5
Understanding of the credentialing processes for health professionals	3.5	1.5
Understanding of the cultural infrastructure of universities and health care	4.5	1.5
Understanding of the current health care environment	4.5	1.5
Understanding of the principles of data, information & knowledge organization	4	1.5
Understanding of the scholarly publishing process	4	1.5
Understanding of the technology issues in an electronic environment, such as privacy and security	4	0.5
Understanding the structure of complex bibliographic databases	4	0.5
Web site creation skills	3	1
Willingness to be a team player or collaborator	5	1

APPENDIX Q

LIS EDUCATORS' ROUND 2 RATINGS OF PERSONAL COMPETENCIES

Table Q.1

Median Scores and Interquartile Ranges of the Personal Competencies Rated by the LIS Educators in Round 2

Personal Competency	*Mdn*	IQR
Ability to communicate effectively	5	0
Ability to deal with "high-powered" clientele	4.5	1.5
Ability to embrace and adapt to change	5	1
Ability to fit into an existing group of colleagues	4.5	2
Ability to multi-task	4.5	1
Ability to see the big picture	4.5	1
Ambition	4	1.5
Analytical ability	5	1
Assertiveness	3.5	1.5
Belief in ethical professional practice	5	0.5
Collaborative	4.5	1
Comfortable getting out of the library and working on other committees	4.5	1
Commitment to cooperate with professionals, inside and outside of library and information sciences	5	1.5
Commitment to evidence-based practice	4	1.5
Confidence	4.5	1.5
Creativity	4	1
Critical thinker	5	0
Curiosity	5	1
Dedication	4	1
Desire to assist others	4.5	1
Diligence	4.5	1.5
Efficient time management	4.5	1
Embrace and encourage diversity	4.5	1.5
Emotional intelligence	5	2
Empathy	4	1.5
Enthusiasm	5	1
Eye for vision and mission	4	0
Friendliness	3.5	2
Flexibility	5	1
General interest in people	5	1
General interest in the profession	5	2
Grace under pressure	4.5	1
Independent thinker	4.5	1
Initiative	5	1
Intelligence	5	1
Interpersonal skills	5	0

(*table continues*)

Table Q.1 (*continued*)

Personal Competency	*Mdn*	IQR
Maturity	4	1
Passion	5	2
Persistence	4	2
Personal integrity	5	0
Pleasant demeanor	3.5	1.5
Political intelligence	4	0.5
Professional passion	5	1
Professionalism	5	0
Professionally active	4	2
Resilience	4.5	1
Self-motivated	5	1
Sense of humor	3.5	1.5
Sense of responsibility	5	0.5
Strong intellect	5	1
Strong motivation for lifelong learning	5	1
Team player	5	1
Tenacity	4	0.5
Value service	5	1
Wanting to make a difference	4	1
Willingness to learn	5	0
Willingness to take creative risks	4	0.5

APPENDIX R

LIS ADJUNCT FACULTY/HEALTH SCIENCES LIBRARIANSHIP PRACTITIONERS'

ROUND 2 RATINGS OF PROFESSIONAL COMPETENCIES

Table R.1

Median Scores and Interquartile Ranges of the Professional Competencies Rated by the LIS Adjunct Faculty/Health Sciences Librarianship Practitioners in Round 2

Professional Competency	*Mdn*	IQR
Ability to apply theory	3	1
Ability to build Web documents, including blogs, libguides, and other non-programming interfaces	4	1.5
Ability to critically assess clinical research articles	4	0
Ability to evaluate the various users in a health setting	3.5	1.5
Ability to innovate	4	1.5
Ability to match health information needs with available information resources	4	0.5
Ability to recognize that academic health sciences librarianship requires more than 9-5 M-F commitment	4	0
Ability to work under pressure	4	1.5
Advanced computer skills	3	0.5
Analytical skills	4	1.5
Basic information management skills	4	1
Basic reference skills, including interviewing, retrieval, and evaluation	4	1
Commitment to being a librarian	4.5	1
Commitment to life-long learning, both knowledge and skill development	4	1
Common sense	5	1.5
Competence and skill in team-based collaborative activities	4	1
Competence with functional and theoretical application of citation management tools	4	1
Database searching skills	5	0.5
Dedication	4.5	1
Familiarity with research methods and design	4	1.5
Familiarity with Web design and usage	3.5	1
Interpersonal skills	5	1
Knowledge about health sciences environment and trends	3.5	2
Knowledge about health sciences librarianship	4	1
Knowledge and competence in library acquisition, including preparation to adapt to local purchasing conventions	3	0
Knowledge and competence in social and cultural diversity	4	0.5
Knowledge of customer service standards for information professionals in the health care and research enterprise	4	1
Knowledge of information ethics and health care	4	0.5
Knowledge of the American Library Association (ALA) Code of Ethics	3	1.5
Mastery of English language competence required in a US academic health sciences campus	4	1.5
Medical literature searching skills	4	0.5
Oral and written communication skills	4	1
Proficiency with and interest in current and emerging information technologies	4.5	1

(table continues)

Table R.1 (*continued*)

Professional Competency	*Mdn*	IQR
Project management skills	4.5	1
Resilience in attitude toward receiving feedback and expecting that most innovation faces initial resistance	4	0.5
Strong knowledge of the health sciences literature, including print and electronic resources	4	0.5
Strong knowledge of US health care education, especially the Accreditation Council for Graduate Medical Education (ACGME) core competencies	3.5	1
Teaching and instructional design skills, including knowledge of pedagogy	4	0
Theoretical and practical understanding of RSS, both for tracking emerging knowledge and building self-updating web pages	3.5	1
Understanding of basic descriptive and inferential statistics	3	0.5
Understanding of data organization, including the Medical Subject Headings (MeSH)	5	1
Understanding of database design and management	3.5	2
Understanding of evidence-based medicine	4	0.5
Understanding of information needs in the health sciences	4	1
Understanding of subject headings and metadata tags used in health care	4.5	1.5
Understanding of scholarly communication, including copyright and open access	3.5	1
Understanding of the importance of immediacy in health care and ability to react quickly	4.5	1
Vision	3.5	1

APPENDIX S

LIS ADJUNCT FACULTY/HEALTH SCIENCES PRACTITIONERS' ROUND 2

RATINGS OF PERSONAL COMPETENCIES

Table S.1

Median Scores and Interquartile Ranges of the Personal Competencies Rated by the LIS Adjunct Faculty/Health Sciences Librarianship Practitioners in Round 2

Personal Competency	*Mdn*	IQR
Ability to adapt to change	5	1
Ability to deal with fluid boundaries of field-- not set in what libraries or librarians do	4	0.5
Ability to identify and evaluate possible solutions to problems/barriers	4	0
Ability to improve services	4	1.5
Ability to take risks	4	1
Ability to work independently, requesting appropriate input/guidance when needed	4	0.5
Ability to work with others in a collegial and professional manner	4	1
Analytical	4	1.5
Application of knowledge	4	1.5
Appreciation of various cultural/professional contexts	4	1
Attention to detail	4	1.5
Background in the sciences	3	0
Basic reference skills	4	0
Basic technical service skills	3	0.5
Collaborative orientation	4.5	1.5
Commitment to ongoing professional development	4	1.5
Commitment to serve	4	1.5
Communication skills	4	1
Communicator	4	0.5
Community-centered; genuinely desires consensus and harmony	4	1
Continuous learner; is able to keep up with changing environment	4.5	1
Course development skills	3	1
Creativity	4	2
Curiosity	4	1
Doggedness; never gives up	3	1.5
Emotional intelligence	4	1
Enthusiasm for new information technologies	4	1.5
Ethical	5	1
Fiscally aware	3	0.5
Flexibility	4.5	1
Generosity	3	1
Humility; ability to be wrong and admit it	4	0.5
Innovator	3	1.5
Intelligent	4.5	1
Interest in working in interprofessional teams	4	1.5

(*table continues*)

Table S.1 (*continued*).

Personal Competency	*Mdn*	IQR
Interested in other people	4	1.5
Knowledge of important databases, such as CINAHL	4	2
Knowledge of medical terminology, such as MeSH	4	1.5
Leadership skills	3	0.5
Loyalty	3	1
Organized	3.5	1.5
Outreach skills	4	1
Personality	3	1.5
Positive	4	2
Proactive	4.5	1
Professional attitude	4	1.5
Pursues a work/life balance that is sustainable	3	1
Repays debts of gratitude in a variety of ways	3	0.5
Respect	4	1.5
Searching skills for Medline in any format	4	0.5
Seeks opportunities to be involved	4	1
Seeks positive solutions	4.5	1
Self-aware	4	0.5
Self-confident	4	0.5
Self-learner	5	1
Self-motivated	5	1
Sense of humor	4	1
Service oriented	4	1
Social vision; looks right at customers and colleagues	3.5	1
Strong sense of own integrity	4.5	1.5
Teaching skills	4	0
Team player	4	1
Time management skills	4	0
Understanding of American Library Association Code of Ethics	3	1
Understands and honors confidentiality	5	1.5

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