Issues in Science and Technology Librarianship

Health Information Use After Graduation: Are We Preparing Our Students for Professional Practice?

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Abstract

This study aimed to determine which information resources Grand Valley State University (GVSU) alumni from four health science programs utilize in clinical practice. It also explored alumni opinions of their educational experiences at GVSU in relation to information literacy and library resources. A survey was administered to alumni who had graduated with a degree in athletic training (BS), nursing (BS, MS, DNP), physical therapy (MPT and DPT), or physician assistant studies (MPAS). We received 451 valid responses (12.8% response rate). The survey focused on specific resources used in the professional workplace, GVSU preparation for information literacy in the workplace, alumni confidence in information literacy skills, and additional preparation that could have been helpful after graduation. Survey responses are reported by discipline and degree earned. Insights from this study will inform liaison librarian conversations with faculty members and decisions regarding resource acquisition to help students transition from the academic environment to professional practice.

Introduction

Employers in the United States increasingly expect, if not demand, that employees, at the time of hiring, possess information literacy skills, including the ability to locate and process information (Head et al. 2013; Head 2017). Among healthcare employers, competencies and standards of practice for accreditation or professional licensure, or both, often include requirements for information literacy proficiency (Childers 2010; American Nurses Association 2015; National Athletic Trainers' Association 2015; Commission on Accreditation in Physical Therapy Education 2017). Our study goes beyond graduation to gain a baseline of what information resources our graduates use in the workplace, their self-perception of their own ability to find and evaluate information, and how well their education prepared them for work in their field.

GVSU is a comprehensive, public liberal arts university with campuses in western Michigan. Enrollment in the Fall 2018 semester included 21,680 undergraduates, 2,711 masters students, and 286 doctoral students. The University Libraries has three primary locations: the main library in Allendale and two locations in downtown Grand Rapids, one of which is a health sciences library. The University Libraries uses a liaison model for instruction and collections work, and the programs surveyed in this study are supported by three liaison librarians.

There is no formal or credit-bearing information literacy program at GVSU. Information literacy instruction is provided primarily by liaison librarians, working in conjunction with course faculty, ideally tailored to specific program needs. The majority of students receive initial information literacy instruction in a required freshman-level writing course, and liaisons work with faculty to build upon those skills in subsequent courses. The guiding principles that frame instruction include the ACRL Framework for Information Literacy for Higher Education (Association of College & Research Libraries 2015) and GVSU Libraries' Information Literacy Core Competencies (Beaubien et al. 2013). The Information Literacy Competency Standards for Nursing (Association of College & Research Libraries 2013) also serves as a guide for library instruction in the nursing programs.

This study identifies patterns of information use in the workplace, possible correlations between information literacy instruction at GVSU and perception of preparedness, and information about which key people at the university provided the necessary skills in the alumni's professional practice.

Literature Review

The professional organizations that set the competency standards of practice for most healthcare workers in the United States require certain levels of information literacy skills. For example, the American Nurses Association asserts that registered nurses should be able to find, critique, and integrate evidence-based knowledge into nursing practice (American Nurses Association 2015).

Nursing is not alone in these requirements. There are similar competencies outlined for physician assistants, athletic trainers, and physical therapists (Childers 2010; National Athletic Trainers' Association 2015; Commission on Accreditation in Physical Therapy Education 2017). Often, these competencies fall under the umbrella of evidence-based practice (EBP). For example, the National Athletic Trainers' Association (2015) lists the ability to "conduct a literature search using a clinical question relevant to athletic training practice using search techniques (e.g.,

Boolean search, Medical Subject Headings) and resources appropriate for a specific clinical question" among the knowledge and skills expected of entry-level athletic trainers.

According to Head (2017), there have been very few studies focused on information literacy practices in the workplace. Of these few studies, most have been based on surveys or case studies involving graduates of several different institutions, who have therefore had varying amounts of information literacy instruction, and very few of these were conducted in the United States (Beke-Harrigan et al. 2008; Clarke et al. 2013; Forster 2015; Gilmour et al. 2016).

Powell and Case-Smith (2003, 2010), however, have published surveys of information literacy skills used by graduates of The Ohio State University's occupational therapy programs. Their first study surveyed 223 graduates of the bachelor's level program, which revealed that only 26% used online databases such as MEDLINE and CINAHL on the job (Powell & Case-Smith 2003). A follow-up survey of graduates of the Masters of Occupational Therapy (MOT) program compared results to that of the BS degree program and found that of the 43 respondents, 72% regularly used MEDLINE or CINAHL databases (Powell & Case-Smith 2010).

Our survey asked GVSU alumni of Athletic Training, Nursing, Physical Therapy, and Physician Assistant Studies about their perceptions of how library instruction and resources prepared them to find, evaluate, and apply information in professional practice. The study reported here applies a unique focus, because graduates from a variety of health science disciplines at a single institution were surveyed. There have been studies focused on occupational therapy and nursing graduates, as indicated above, but none that include graduates of athletic training, physician assistant studies, or physical therapy. Our study also identifies far more specific resources used in professional practice than previously published studies.

Methods

This study aimed primarily to determine which resources GVSU alumni from various health science programs utilize post-graduation. The study also assessed alumni viewpoints about the quality and usefulness of those resources. A secondary goal of this study was to explore alumni opinions of their educational experiences at GVSU in relation to information literacy and library resources.

Population and Sample

The data for this study were obtained through the use of an anonymous SurveyMonkey questionnaire administered to alumni who had graduated from one of these four health sciences programs: Athletic Training (BS), Nursing (BS, MS, DNP), Physical Therapy (MPT and DPT), or Physician Assistant Studies (MPAS).

The questionnaire, designed in consultation with the GVSU statistical consulting center, contained a combination of closed-ended quantitative and open-ended qualitative questions (see Appendix A). Additional data on the number of instruction sessions delivered to each program from 2008 to 2016 were obtained from records maintained on the GVSU Libraries' intranet. The project was reviewed by GVSU's Human Research Review Committee and was deemed qualified for exempt status.

In early November 2016, emails were sent to 3,529 GVSU alumni. Reminders were sent later that month. The survey was closed in early December 2016. After completing the survey, respondents had the option to provide their names for a drawing for one of four $50 gift cards. A total of 451 valid responses were received. This represents a response rate of 12.8%, which is typical for this type of survey (Hardigan et al. 2012).

Because of the high rate of non-response, the n=451 valid responses can best be described as a non-probability sample of convenience. While the authors have no reason to suspect that non-response varied in any kind of systematic way, generalizations of this population or other similar populations of alumni should be made with caution due to the nature of the sample.

The total sample sizes for particular questions vary (between n=379 and n=432), since they depend on skip instructions within the survey (i.e., not all questions were relevant to all respondents), methodological decisions made to account for non-response, and the presence of uncodable responses in the qualitative portion of the study.

Data Preparation and Analysis Procedures

The quantitative data were extracted from SurveyMonkey and imported into Microsoft Excel and SPSS for further analysis. Data cleaning for question non-response and other relevant methodological issues was done prior to data analysis. Qualitative responses were coded and analyzed using an inductive, multi-stage content analysis procedure as described by Strauss (1987) and Berg (2007). The authors conducted both manifest and latent content analysis of the relevant open-ended survey response questions in an effort to organize the data into theoretically meaningful themes and axes. In order to help ensure the reliability of coding decisions, the primary investigators worked together when coding the qualitative data.

Results

Respondent Demographics

We received a total of 451 valid responses. The first question asked respondents to indicate if they were currently working in a healthcare-related field. Only those responding affirmatively could continue the survey, which resulted in a total of 432 respondents. Fewer than 5%

Table 1. Respondents' Most Recent Health Science Degree from GVSU.

Degree	n	%
Athletic Training (BS)	40	9.3
Nursing (BSN)	220	50.9
Nursing (MSN)	23	5.3
Nursing (DNP)	20	4.6
Physical Therapy (MPT)	30	6.9
Physical Therapy (DPT)	62	14.4
Physician Assistant Studies (MPAS)	37	8.6

graduated before 2000, 55.6% graduated between 2001 and 2011, and 40% graduated in 2012 or later. Responses were obtained for all seven degree programs, with over half the responses from the undergraduate nursing program (Table 1).

Resources Used to Locate and Obtain Professional Information

Respondents were asked to list up to five resources they use most often for professional information needs. Rather than providing a close-ended list of choices, the authors provided open-ended text boxes to capture the widest possible variety of resources that might be used. All answers were subsequently coded by the authors. The authors identified the five resources used most frequently by each profession (Table 2). A complete list of all resources named by two or more respondents are listed in descending order in Appendix B. Resources named by only one respondent were aggregated by resource type (e.g., other journal titles or other societies/orgs).

Table 2. Top Five Resources Used in the Workplace, by Respondent's Degree Program.

Degree	Resource 1	Resource 2	Resource 3	Resource 4	Resource 5
Athletic Training (BS, n=35)	PubMed (31)	NATA[a] (17)	J Athl Train[b] (16)	Am J Sports Med[b] (4)	Google Scholar (3)
Nursing (BSN, n=184)	PubMed (73)	UpToDate (59)	CINAHL (56)	Medscape (18)	Lexicomp (14)
Nursing (MSN, n=20)	CINAHL (8)	PubMed (8)	UpToDate (8)	Epocrates (5)	AANP[a] (4)
Nursing (DNP, n=18)	UpToDate (15)	PubMed (8)	CINAHL (6)	Epocrates (5)	AAFP[a] (2)
Physical Therapy (MPT, n=26)	PubMed (15)	APTA[a] (13)	CINAHL (6)	Phys Ther[b] (4)	Google Scholar (3)
Physical Therapy (DPT, n=59)	PubMed (39)	APTA[a] (31)	J Orthop Sports Phys Ther[b] (17)	CINAHL (16)	Phys Ther[b] (13)
Physician Assistant (MPAS, n=37)	UpToDate (32)	PubMed (16)	Epocrates (12)	JAAPA[b] (9)	Medscape (9)

[a] Website Abbreviations: AAFP = American Academy of Family Physicians, AANP = The American Association of Nurse Practitioners, APTA = American Physical Therapy Association, NATA = The National Athletic Trainers' Association.
[b] NLM ISO journal abbreviation.

As Table 2 shows, alumni from all programs named PubMed among the top two resources used, and CINAHL was named among top three for all nursing alumni. Generally, nursing and physician assistant studies alumni rely more on point-of-care clinical resources, such as

UpToDate, Epocrates, and Medscape, whereas athletic training and physical therapy alumni more often named discipline-specific journals and professional societies.

For each of the resources listed, the authors then asked respondents "Why do you use them?" Options included accurate, current, easy to use, fast, and no other resource available. We also asked respondents to indicate who provides the resource. Options included free, respondent pays for it, provided by employer, provided by public library, and provided by a university. The responses to these questions were inconclusive and unhelpful to our original research question.

Confidence in Finding, Evaluating, and Applying Research

We asked respondents to indicate their confidence level in finding and evaluating information related to professional practice and applying published research to practice using a Likert scale ranging from 1 (very confident) to 4 (not at all confident). Across all skills, more than 85% of respondents ranked their confidence as 1 or 2 (Table 3). Based on Chi-Square tests, there is no statistical difference in confidence between the various programs when it comes to finding ($p=0.11$) and evaluating information ($p=0.22$). However, we did find a statistically significant difference ($p=0.002$) in applying research to practice, indicating alumni from some programs are more confident in applying research to professional practice than alumni from other programs.

Table 3. Respondents' Confidence in Finding, Evaluating, and Applying Research.

How confident are you in…	**Finding information related to professional practice?**		**Evaluating information related to professional practice?**		**Applying research to practice?**	
	1-2 (Confident)	**3-4 (Not confident)**	**1-2 (Confident)**	**3-4 (Not confident)**	**1-2 (Confident)**	**3-4 (Not confident)**
Athletic Training (n=35)	97.0%	3.0%	100.0%	0.0%	100.0%	0.0%
Nursing (BSN, n=184)	91.8%	8.2%	91.3%	8.7%	85.4%	14.6%
Nursing (MSN, n=20)	100.0%	0.0%	90.0%	10.0%	95.0%	5.0%
Nursing (DNP, n=18)	94.4%	5.6%	94.4%	5.6%	94.4%	5.6%
Physical Therapy (MPT, n=26)	100.0%	0.0%	95.8%	4.2%	95.8%	4.2%
Physical Therapy (DPT, n=59)	98.2%	1.8%	98.2%	1.8%	98.2%	1.8%
Physician Assistant (n=37)	100.0%	0.0%	97.2%	2.8%	100.0%	0.0%

Preparing Students for Professional Practice

We asked respondents if they think the skills they learned at GVSU prepared them for finding and using information in professional practice (Table 4). Overall, 92.1% of the respondents answered in the affirmative; only 7.9% felt GVSU had not prepared them. We also asked how respondents acquired their skills, e.g., from professors, classmates, or librarians. Across all professions, professors were most frequently cited in helping students prepare for their careers. Within the nursing profession, formal library instruction was the second-most cited source, followed by classmates. The reverse was true for athletic trainers, physician assistants, and physical therapists, who cited classmates ahead of formal library instruction. Across all professions, online library guides and tutorials were cited more often than meeting with a librarian.

Table 4. Perception of Preparation for Practice and by Whom (All Years).

Degree	**Did GVSU prepare you?**		**Most frequently mentioned source of skills**					
	Yes	**No**	**Professor**	**Class mates**	**In-class library instruction**	**Online guides and tutorials**	**Met with librarian outside of class**	**Other**
Athletic Training (n=35)	97.1%	2.9%	88.6%	45.7%	28.6%	28.6%	5.7%	0.0%
Nursing (BSN, n=184)	88.6%	11.4%	55.4%	32.6%	45.1%	26.1%	12.0%	1.6%
Nursing (MSN, n=20)	95.0%	5.0%	85.0%	35.0%	40.0%	30.0%	25.0%	0.0%
Nursing (DNP, n=18)	94.4%	5.6%	77.8%	66.7%	66.7%	33.3%	27.8%	0.0%
Physical Therapy (MPT, n=26)	92.3%	7.7%	73.1%	42.3%	34.6%	11.5%	7.7%	0.0%
Physical Therapy (DPT, n=59)	100.0%	0.0%	89.8%	55.9%	25.4%	20.3%	3.4%	1.7%
Physician Assistant (n=37)	89.2%	10.8%	75.7%	56.8%	35.1%	18.9%	10.8%	2.7%

We then added available instruction data for each program and re-analyzed the results of Table 4, including responses only from respondents who were enrolled during the time span for which instruction data were complete, 2008 – 2016. Overall, the nursing program had more library instruction than the other programs, and nursing alumni who responded to the survey were more likely to include library instruction as a source of important skill acquisition (Table 5). A causal

connection between these two facts cannot be made, because it is unknown whether survey respondents were present at any of the reported library instruction sessions.

Table 5. Perception of Preparation for Practice and by Whom (2008-2016).

Degree	Did GVSU prepare you?		Most frequently mentioned source of skills						2008-2016 Library Instruction Sessions
	Yes	No	Professor	Class mates	In-class library instruction	Online guides and tutorials	Met with librarian outside of class	Other	
Athletic Training (n=30)	100.0%	0.0%	93.3%	50.0%	33.3%	33.3%	6.7%	0.0%	8
Nursing (BSN, n=116)	89.7%	10.3%	58.6%	36.2%	56.9%	29.3%	14.7%	2.6%	138
Nursing (MSN, n=10)	90.0%	10.0%	90.0%	30.0%	50.0%	40.0%	20.0%	0.0%	15
Nursing (DNP, n=17)	94.1%	5.9%	76.5%	64.7%	64.7%	35.3%	23.5%	0.0%	11
Physical Therapy (DPT, n=54)	100.0%	0.0%	96.3%	59.3%	25.9%	20.4%	3.7%	0.0%	8
Physician Assistants (n=21)	85.7%	14.3%	85.7%	61.9%	28.6%	33.3%	9.5%	0.0%	13

Qualitative Data

To gain more insight into the transition from student to practitioner, we asked three open-ended questions. The first question asked, “What is one thing you learned at GVSU that has helped you find and use information pertaining to your professional practice?” Most of the responses corresponded to three themes: how to find information (39.2%), how to evaluate information (36.4%), and how to use library databases (18.4%). Sample responses include

> “…how to search for research that is both current and relevant to clinical practice. I am confident in my ability to differentiate between reliable sources and non-scholarly authors. As a result, I am able to apply the concepts that I have learned through research to clinical practice and overall improve patient outcomes,”

and,

> "As a practicing RN I found evidence-based practice to be the best way to improve healthcare. Learning how and where to find accurate research articles about it was a very helpful thing that I learned…"

The second question asked, "What is one thing you wish you had learned at GVSU that would have helped you find and use information pertaining to your professional practice?" Most of the responses corresponded to these themes: free or subscription resources for use after graduation (24.0%), better searching skills (14.8%), learning how to evaluate information (7.4%), and more library instruction (7.4%). Sample responses include

> "Learn how to effectively use and find free (non-employer or university based) literature."

and,

> "How to use the databases early on freshman year, I didn't learn until later on in my education."

The third question asked, "What advice would you give to students in your field regarding finding and using information while in school?" The most frequent responses corresponded to these themes: utilize the library (25.6%), consult a librarian (18.2%), and develop good habits (17.4%). Much of the advice related to "develop good habits" focused on taking advantage of the educational environment to practice searching skills so that it becomes easier and more efficient in the clinical environment. Sample responses include

> "Learn how to evaluate your sources. The best ways to find information will probably change over time as new technologies become available, but it will always be important to understand what you're reading and how well it applies to your situation."

and,

> "Ask for help, be persistent, don't be afraid to make mistakes, keep trying."

Discussion

Health care professionals must be proficient in finding, evaluating, and applying information in professional practice, and continuing education is required to maintain licensure and/or certification in most health professions. Knowing how to access and utilize information resources is a key component of staying current in a field, and information literacy is essential for evidence-based practice (Forster 2013).

Among the main findings of this study were the most frequently used information resources by respondents in their professional practices. We asked this open-ended, multiple-response question to learn if alumni utilized the same resources in professional practice that they had access to as students. GVSU, like many universities, selects databases and other resources to support academic programs. Our libraries' database licenses limit access to current students, faculty, and staff, and, consequently, alumni don't have access to them. We regularly evaluate these resources to ensure they are utilized, cost-effective, and relevant to the curricula. Currently, the likelihood that alumni might use them following graduation is not an evaluative consideration, but perhaps should be.

The resources reported by respondents varied widely, not only among the different disciplines, but between individuals within the same profession. Although the three most often cited resources, PubMed, CINAHL, and UpToDate, were included in the question prompt, Web of Science was also in the prompt and was rarely mentioned as a resource used. Additionally, respondents named many more specific resources that were not included anywhere in the survey questions. As students at GVSU, the survey respondents would have had access to PubMed (freely available since 1997), CINAHL (2006-present), and UpToDate (2010-2015). Although some individual journal titles and/or professional organizations may have been included in library instruction, PubMed and CINAHL are likely the resources most frequently taught in library instruction sessions based on anecdotal evidence. It is possible that GVSU-provided access and instruction factored into PubMed and CINAHL being cited more frequently than other resources. We cannot quantitatively measure this relationship, since it is unknown whether survey respondents were present at any of the reported library instruction sessions. Our library instruction classes in the health sciences continue to focus on PubMed and CINAHL; however, since working on this survey, GVSU health sciences librarians have created online guides and handouts listing resources that are freely available after graduation.

The use of such an open, multiple-response question provides rich data, but also makes analysis complicated and time-consuming. This type of data is also what makes this study unique. Previous attempts to determine which information resources health professionals use in practice have neither followed alumni of different programs from a single institution nor allowed respondents to list which resources they actually use. In their survey of registered nurses working at a single institution, the only databases mentioned in Beke-Harrigan, et. al. (2008) are CINAHL, Medline, and Google. Likewise, Clarke, et. al. (2013), in their systematic review of information seeking by nurses and physicians, reported non-specific resources, such as "textbooks" and "internet." No specific databases or journals were named, and the review compiled results of many different studies, so the sample of practicing professionals had graduated from many different institutions. Forster's (2015) phenomenographic study of 41 practicing nurses focused on the nurses' knowledge of and attitudes toward information literacy in general and did not query the subjects about which information resources were used in the workplace. Gilmour, et. al. (2016) conducted a large survey of New Zealand nurses about their access to online information used in evidence-based practice and patient education. Their results focused on frequency of internet access and barriers, rather than resources used, although Google, Yahoo, CINAHL, PubMed, and Wikipedia were listed as the most popular search strategies, in that order.

The studies of Powell and Case-Smith (2003, 2010) were closest to gathering the type of information this study sought to find. Both of their surveys targeted alumni of their institution's occupational therapy (OT) program, the first limited to undergraduate alumni (2003), and the second, alumni with graduate degrees in OT (2010). However, their studies did not provide an option for respondents to name resources used. Rather, the survey asked respondents if they used CINAHL/MEDLINE as a yes/no question. Another yes/no question asked if the alumni had used databases such as PsychINFO, ERIC, or Periodical Abstracts.

Therefore, based on these previous studies of healthcare professionals in the workplace, we didn't know which resources they actually use for their work. Our open-ended response format produced complicated data to analyze, but ultimately our results yielded more detail about specific resources that GVSU graduates use during work. The varied responses, which included resources provided to them as GVSU students and resources they would not have had access to

at GVSU, suggest that the liaison librarians should focus on providing instruction related to transferable concepts of information literacy rather than proficiency in searching specific databases.

Other results from this study showed that a vast majority of respondents felt that our university prepared them to access and use information in their professional practice, and they felt confident in their ability to locate and evaluate information. Most indicated they acquired those skills from their professors. Library instruction, subject guides, and tutorials were credited to a lesser extent.

It is useful to bear in mind that previous research shows that self-reported skills do not reliably reflect actual skills (Robertson & Felicilda-Reynaldo 2015). This study was limited by two factors in its ability to determine whether library instruction influenced workplace information literacy skills. One limiting factor is that this survey measured perception of learning. Creating a means by which to measure graduates' actual information seeking skills would result in a more meaningful indicator of their search abilities and is an area for further exploration. The other limiting factor is the nature of the instructional sessions data combined with the anonymous data collection of the survey. There is no way to determine if survey respondents were present at any of the recorded library instruction sessions, so causal inferences cannot be made regarding whether those alumni who had library instruction are more likely to indicate librarians or library instruction as a source of skills. However, Spievak and Hays-Bohanan (2013) found that students who had attended at least one library instruction session were significantly more likely to seek assistance from a reference librarian and to search library databases for articles.

Most respondents stated that they learned information-seeking skills from their professors. Many classroom faculty in the health sciences embed database searching, critical appraisal of the literature, and evidence based practice into their courses instead of, or in addition to, formal library instruction. This does not negate the impact that librarians, library instruction, and library resources have. Librarians at GVSU frequently collaborate with faculty members on lesson plans, online guides, and other library resources relevant to courses. It is possible that librarians have an indirect effect on professor behavior, and therefore are, perhaps, partially responsible for how highly professors are ranked. Future research could attempt to measure the effect of librarian collaboration with teaching faculty. The survey did indicate that graduates found library instruction, online subject guides, and consultations with librarians beneficial. When asked about advice for current students, a recurring theme was to take advantage of library resources, including meeting with librarians. As one respondent stated, "the librarians are extremely helpful in finding information and showing people how to search themselves. Professors can also help, but they usually know less than the librarians when it comes to finding information and navigating the websites." This suggests that librarians need to communicate regularly with classroom faculty about how we can enrich students' learning experience and capitalize on "teachable moments" with students.

When asked what skills alumni wish they had learned, one alumnus stated, "I wish I had learned how to effectively use and find free (non-employer or university based) literature." As we move forward, development of tools such as online library guides focused on effective searching and evaluation techniques would help students transition from university-provided databases to the wide variety of resources they will likely use in professional practice.

Conclusion

Considering that few alumni studies related to information literacy have been conducted with graduates of health sciences programs, we present these results as an exploratory study of resource utilization by alumni of a comprehensive masters-plus university. This study provides insight into how resource utilization varies by field and degree program, as well as graduates' perceptions of their preparation to become well-informed users of information in their professional fields. Still, given that the present study uses data from only one institution and relies upon a self-selected sample of respondents, we cannot be certain if the results and conclusions presented here would generalize to the remainder of our university's alumni or beyond the campus of this institution.

We suggest that replications of this research would be useful to determine how alumni from other schools utilize resources in professional practice. Collecting alumni perceptions about particular types of preparation (e.g., by professors, librarians, or working with fellow students) could also be a helpful step in trying to create an understanding of what is optimally effective in empowering graduates to become independent, well-qualified consumers and users of information.

The quantitative and qualitative data gleaned from this study will inform conversations with faculty members and decisions regarding resource acquisition to help students transition from the academic environment to professional practice. Ultimately, the better we prepare health sciences students while they are in school, the better they will be as practicing clinicians or researchers. That will have important benefits not only for the discipline, but also for the patients and clients being served.

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Appendix A

Health Information Use in Professional Practice Survey Questions

1. Are you currently working in an area related to health care?
   Yes
   No (respondent is thanked for their time and the survey is ended)

2. What year did you graduate? [list of years]

3. What was your most recent degree from GVSU? (choose the most recent one)
   B.S. Athletic Training
   B.S. Nursing
   Master of Science-Nursing
   Doctor of Nursing Practice
   Master of Physician Assistant Studies
   Master of Physical Therapy
   Doctor of Physical Therapy

4. Please list up to five resources you use most often for professional information needs. For example, PubMed, CINAHL, UpToDate, Web of Science, professional association web sites, and/or personal journal subscriptions (for professional web sites or personal subscriptions, please fill in the specific association or journal title).

Resource
[fill in the blank]
[fill in the blank]
[fill in the blank]

[fill in the blank]
[fill in the blank]

5. For each resource you listed in Question 4, please tell us why you use it (check all that apply).

	Accurate	Current	Easy to Use	Fast	No other resource available
Resource 1	[ ]	[ ]	[ ]	[ ]	[ ]
Resource 2	[ ]	[ ]	[ ]	[ ]	[ ]
Resource 3	[ ]	[ ]	[ ]	[ ]	[ ]
Resource 4	[ ]	[ ]	[ ]	[ ]	[ ]
Resource 5	[ ]	[ ]	[ ]	[ ]	[ ]

6. For each resource you listed in Question 4, please tell us who provides the resource (check all that apply).

	Free	I do	My employer	Public Library	University
Resource 1	[ ]	[ ]	[ ]	[ ]	[ ]
Resource 2	[ ]	[ ]	[ ]	[ ]	[ ]
Resource 3	[ ]	[ ]	[ ]	[ ]	[ ]
Resource 4	[ ]	[ ]	[ ]	[ ]	[ ]
Resource 5	[ ]	[ ]	[ ]	[ ]	[ ]

7. How confident are you in…?

	Very confident			Not at all confident
Finding information related to professional practice	O	O	O	O
Evaluating information related to professional practice	O	O	O	O
Applying research to practice	O	O	O	O

8. Did skills you learned at GVSU prepare you for locating and using information in your professional practice? Choose all that apply.
   Yes, from my professor
   Yes, from library instruction during a class session
   Yes, from meeting with a librarian outside of class
   Yes, from online library guides and tutorials
   Yes, from classmates
   No
   Other _____

9. What is one thing you learned at GVSU that has helped you find and use information pertaining to your professional practice? (open comment box)

10. What is one thing you wish you had learned at GVSU that would have helped you find and use information pertaining to your professional practice? (open comment box)

11. What advice would you give to students in your field regarding finding and using information while in school? (open comment box)

Appendix B

Complete List of Resources Used in the Workplace by Program

Athletic Training (BS, n=35)	**Nursing** (BSN, n=184)	**Nursing** (MSN, n=20)	**Nursing** (DNP, n=18)	**Physical Therapy** (MPT, n=26)	**Physical Therapy** (DPT, n=59)	**Physician Assistant** (MPAS, n=37)
PubMed (31)	PubMed (73)	CINAHL (8)	UpToDate (15)	PubMed (15)	PubMed (39)	UpToDate (32)
NATA[a] (17)	UpToDate (59)	PubMed (8)	PubMed (8)	APTA[a] (13)	APTA[a] (31)	PubMed (16)
J Athl Train[b] (16)	CINAHL (56)	UpToDate (8)	CINAHL (6)	CINAHL (6)	J Orthop Sports Phys Ther[b] (17)	Epocrates (12)
Am J Sports Med[b] (4)	Medscape (18)	Epocrates (5)	Epocrates (5)	Phys Ther[b] (4)	CINAHL (16)	JAAPA[b] (9)
Google Scholar (3)	Lexicomp (14)	AANP[a] (4)	AAFP[a] (2)	Google Scholar (3)	Phys Ther[b] (13)	Medscape (9)
NSCA[a] (2)	CDC[a] (12)	AAFP[a] (2)	Other Societies/Orgs[c] (10)	Medscape (3)	GoogleScholar (9)	AAPA[a] (4)
SPORTDiscus (2)	ENA[a] (9)	Lexicomp (2)	Other Journals[c] (8)	NIH[a] (3)	Colleagues (4)	Micromedex (4)
Other Journals[c] (6)	AACN[a] (7)	Medscape (2)	Other Databases[c] (5)	J Orthop Sports Phys Ther[b] (2)	Physical therapy blogs (4)	N. Engl. J Med.[b] (4)

Other Societies/Orgs[c] (5)	AORN[a] (7)	NAMI[a] (2)	Other Government Orgs[c] (1)	Other Journals[c] (1)	Textbooks (3)	Textbooks (4)
Other Databases[c] (2)	NIH[a] (7)	Nurse Pract[b] (2)		Other Databases[c] (5)	UpToDate (3)	CDC[a] (3)
	WebMD (6)	Other Databases[c] (11)		Other Societies/Orgs[c] (8)	EBSCO (2)	Clinical Advisor (3)
	ANA[a] (5)	Other Journals[c] (5)		Colleagues (1)	Google (2)	Prescriber's Letter (3)
	Google Scholar (5)	Other Societies/Orgs[c] (8)			Int J Sports Phys Ther[b] (2)	WebMD (3)
	Google (4)	Other Government Orgs[c] (1)			McKenzie Institute (2)	AAOS[a] (2)
	ONS[a] (5)				MPTA[a] (2)	Am Fam Physician[b] (2)
	Lippincott (4)				Pediatr Phys Ther (2)	"Consultant" (2)
	Mayo Clinic (4)				PEDro (2)	Google (2)
	Micromedex (4)				Other Societies/Orgs[c] (12)	J. Am. Acad. Dermatol.[b] (2)
	N. Engl. J. Med.[b] (4)				Other Journals[c] (9)	Orthobullets (2)
	ASPAN[a] (3)				Other Databases[c] (4)	Other Societies/Orgs[c] (14)
	AANN[a] (2)				Other Government Orgs[c] (1)	Other Databases[c] (5)
	WebWISER (2)					Other Journals[c] (4)
	Other Societies/Orgs[c] (48)					Colleagues (1)
	Other Journals[c] (26)					
	Other Databases[c] (25)					
	Other Hospital Policies[c] (11)					

	Other Government Orgs[c] (7)					

[a] Website Abbreviations: AACN = American Association of Critical-Care Nurses OR American Association of Colleges of Nursing, AAFP = American Academy of Family Physicians, AANN = The American Association of Neuroscience Nurses, AANP = The American Association of Nurse Practitioners, AAOS = American Academy of Orthopaedic Surgeons, AAPA = American Academy of Physician Assistants, ANA = American Nurses Association, AORN = The Association of periOperative Registered Nurses, APTA = American Physical Therapy Association, ASPAN = The American Society of PeriAnesthesia Nurses, CDC = Centers for Disease Control, ENA = Emergency Nurses Association, MPTA = Michigan Physical Therapy Association, NAMI = National Alliance on Mental Illness, NATA = The National Athletic Trainers' Association, NIH = National Institutes of Health, NSCA = National Strength and Conditioning Association, ONS = Oncology Nursing Society

[b] NLM ISO Journal Title Abbreviation.

[c] "Other" resources named only once.