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A Community of Practice: Librarians in a Biomedical Research Network

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ABSTRACT

Providing library and reference services within a biomedical research community presents special challenges for librarians, especially those in historically lower-funded states. These challenges can include understanding needs, defining and communicating the library's role, building relationships, and developing and maintaining general and subject specific knowledge. This article describes a biomedical research network and the work of health sciences librarians at the lead intensive research institution with librarians from primarily undergraduate institutions and tribal colleges and universities. Applying the concept of a "community of practice" to a collaborative effort suggests how librarians can work together to provide effective reference services to researchers in biomedicine.

Keywords: Community of practice, role of librarians, academic health center libraries, bioinformatics, primarily undergraduate institutions, tribal colleges and universities, Web 2.0

INTRODUCTION

The multidisciplinary nature of biomedicine and bioinformatics can make it difficult to provide appropriate library staffing and services. Understanding a research community's needs is one hurdle and providing library services to biomedical researchers is another.[1-4] Research networks in lower-funded states often present problems for librarians. While funding is frequently a concern, a lack of institutional support and librarian subject knowledge in biomedicine are often even larger issues. There are longstanding discussions in the field of librarianship concerning professional development for librarians in the disciplines they serve,[5-8] and generalist versus subject specialist levels in the provision of reference services.[9-11] Some have observed that a lack of training in biomedical sciences can lead to problems in understanding terminology, and problems with understanding and searching health science literature databases.[6,8,11] Certainly the expertise of a subject specialist should be respected and even desired, but this does not prohibit librarians from functioning as generalists who can successfully answer reference questions outside of their subject specialization.[9]

The concept of a "community of practice" is one conceptual model librarians might use to develop general and subject specific knowledge to support a research network.[12] The literature suggests that reference librarians in college libraries can provide a high level of reference services in most subject disciplines by collaborating informally with colleagues and subject specialists, or by participating in training activities.[1,8-10,12] Forming a community of practice offers reference librarians an opportunity to work together to build knowledge and skills to develop professionally.[12]

The body of literature about library-based bioinformatics support programs is growing at a robust pace.[1,5-7,13] However, the majority of literature published on this topic is from larger institutions, where such program models are usually applied. Research on smaller libraries, especially from primarily undergraduate institutions (PUIs) and tribal colleges and universities (TCUs) that support the expanding field of biomedical research, are nearly absent from the literature. The intent of this article is to examine the roles of librarians at smaller institutions that support the information needs of biomedical research networks. We offer suggestions to academic health sciences librarians at research-intensive institutions on how they can best serve their outreach constituents by exploring the concept of a community of practice.

BACKGROUND

Efforts and advances in biomedical science are often facilitated as a direct result of funding sources, particularly from the federal government.[13-15] The Institutional Development Award (IDeA) program is funded by the National Institutes of Health (NIH), and was established to broaden the geographic distribution of NIH funding for basic biomedical research.[16] The IDeA Networks of Biomedical Research Excellence (INBRE) support statewide institutional networks in historically lower-funded states that have unique populations, such as rural, minority, or indigenous-serving institutions.[16]

There are currently 23 states (including Puerto Rico) with active INBRE awards.[16] The South Dakota INBRE, known as the South Dakota Biomedical Research Infrastructure Network (SD BRIN), is made up of a lead research-intensive public university and seven partner institutions. The partner institutions include one state-funded PUI, four private PUIs, and two tribal colleges. SD BRIN institutions are listed on the SD BRIN Web site

<https://sites.google.com/a/usd.edu/brin/partner-institutions>. All partner institutions are small

enrollment institutions ranging from 300 students (Sisseton Wahpeton College, tribal) to between

800 and 1800 students except for Black Hills State University (4400 students). Collaboration is

crucial between SD BRIN faculty members at the research-intensive institution, the PUIs, and

TCUs. SD BRIN not only supports and mentors junior faculty and investigators in biomedical

research from participating institutions, but also serves as a pipeline to expose undergraduates

from PUIs and TCUs to cutting-edge scientific research. The aim with the undergraduate

students is to get them interested and involved in further education or careers in science and

research.[17] Undergraduates are brought into the SD BRIN in the Undergraduate Fellows

Program, where they are assigned a mentor and participate fully in a biomedical research project.

Many of the undergraduate research fellows have presented their research at national meetings.

The NIH states that INBRE networks must have a bioinformatics core (a group of

administrative professionals) to provide resources and tools in research, training, and

education to enhance communications, which can include library access to research journals

and databases.[16] The authors previously polled all INBRE PIs, asking them about their own

institution's librarian involvement, as well as the institutions within their grant networks (which

range anywhere from four to twenty-seven partner and outreach institutions).[16] A handful of PIs

said that librarians play a direct role in their INBRE program, while the majority indicated that

there is either no librarian involvement or that there were several informal services performed by

librarians such as reference services and interlibrary loans.

The authors of this article are academic librarians who are currently working or have worked

in the past at the University of South Dakota (SD BRIN lead institution), serving as

administrative members of the network. For SD BRIN, lead institution librarians (LILs) are

health sciences librarians with primary duties at the University of South Dakota schools of

medicine and health sciences. The SD BRIN grant allows for the purchase of scholarly research

resources for the entire network, and the LILs select, license, and provide access to the SD BRIN

journals and databases. The INBRE program was instituted nationally in 2001, and with initial

IDeA funding, many institutions report that they purchased journals and databases for the entire

network. This is not as prevalent in current grant iterations, however some of the lowest funded

states still maintain that purchasing scholarly resources for the network has allowed faculty at the

PUIs to obtain unprecedented access to the literature. One PI states that "this is the 'oldest' and

single most appreciated service that [their] INBRE provides to the PUIs".

 LILs also fulfill a training role with PUI and TCU librarians who work with the SD BRIN

researchers, by arranging online vendor webinars, making site visits, and offering consultation as

needed. In their capacity as LILs, these librarians have had formal training including coursework

in molecular biology, and have attended numerous webinars, courses, and workshops. Examples

of LILs training include the *BioMedical Informatics Marine Biological Laboratory* course

sponsored by the National Library of Medicine (NLM), *Making PubMed Work for You*

<http://www.nnlm.gov/training/work/>, and the *PubMed for Trainers* course

<http://www.nnlm.gov/ntcc/classes/class_details.html?class_id=359>, which is an intensive

online and in-person course on how to teach PubMed to a wide variety of audiences.

DEFINITIONS

A *community of practice* (CoP) is a term first coined by cognitive anthropologists Lave and

Wenger for defining a group of people who share a profession, a set of problems, or a concern

for something.[18] A CoP encompasses constructivist learning, whereby a group learns from and

with each other. A CoP does not have defined characteristics like a weekly meeting or listserv, and they do not necessarily work together every day.[19] CoPs are popular in business and management, but Belzowski, Ladwig and Miller note that universities and academic libraries are slower to adopt CoPs, even though they appear to be a good fit for research and learning environments.[20]

METHODOLOGY

The authors frequently conduct informal surveys to gather information for assessment purposes, using the results to affect positive changes in program quality.[21-22] Brief online surveys are an easy way to gather comments from constituents who might not feel comfortable relating their thoughts in person or on paper, and the open-ended answers to survey questions are invaluable. Past surveys the authors have conducted address topics such as user satisfaction, comments about database trials, and potential journal and database cuts. To understand how academic health sciences librarians at research-intensive institutions can best serve their constituents within a biomedical research network of PUIs and TCUs, the authors surveyed librarians that work with SD BRIN researchers at each SD BRIN institution.

Limitations

It is important to note some of the limits of this study. First, each national INBRE network is constructed in unique ways to meet each network's individual needs. The SD BRIN is certainly no different, and this survey was intended to examine SD BRIN specifically. The small nature of the network necessarily limits the data and possible interpretation to other networks. However, we had a very high response rate from SD BRIN, which makes the data highly informative to those involved.

Surveying the Librarians

Google Forms, part of the Google Drive suite of applications <https://drive.google.com> was used to create the Web-based survey. The survey instrument is displayed in the Appendix. Institutional review board approval was received to conduct the study. Contacts at all eight of the SD BRIN institutions were sent an email in November, 2012. The email requested participation, and included the link to the survey. The population was identified by the lead author's work with librarians and IT personnel in the SD BRIN network when licensing and providing access to databases and journals. The twenty-two item survey addressed areas such as educational background and training, overall job duties and biomedical services the librarians provide.

Statistical Analysis

The Google form was connected to a Google spreadsheet and the survey responses automatically populated into the spreadsheet. Data was manipulated using raw numbers and percentages, and data were tabulated using simple averages.

RESULTS

Of the eight SD BRIN institutions that were contacted, one librarian declined to participate, and one of the institutions had limited librarian services leaving no one from that institution to participate in the survey. Two librarians from the lead institution responded to the survey, so there were seven respondents.

Education and Background

Six of the librarians surveyed ($n = 7$) have graduate degrees in library and information science (LIS) and one has completed 18 hours of graduate credit towards a master's degree in LIS. Of these, three had a second master's degree; one in biology, one in geography, and one in fine arts. Six had bachelor's degrees in either humanities or social sciences, and one had a bachelor's degree in biology.

Job Duties

Three librarians at the SD BRIN institutions are directors of their libraries and one is associate director. The other three librarians are reference librarians; one is health sciences liaison, one is technology librarian, and the other instruction coordinator. The directors and associate director oversee aspects of library operations, such as fiscal management, facilities, staff recruitment and supervision, quality of service, collection development, information access and technology, campus and community outreach, and development and implementation of the library strategic plan in support of the institutional mission.

Two out of the four PUI librarians are the sole librarians who provide reference services in their library. They manage the entire operation with one or two paraprofessionals on staff who provide technical services and interlibrary loan. All of the librarians are responsible for reference and instruction for their entire campus, and function as generalists working with researchers in all areas of scholarship. Each of the librarians stated that they receive user questions on molecular biology databases and tools on average once a month (see Figure 1). They all reported that they had an average to poor level of awareness of resources in molecular biology and genetics, and that they had a similar awareness of non-bibliographic molecular biology resources (see Figure 2).

(PLACE FIGURES 1 AND 2 NEAR HERE)

DISCUSSION

In support of SD BRIN's mission, LILs liaise with and support the PUI and TCU network librarians. Working with these network librarians has many benefits as well as challenges, and the primary challenge is to remember that priorities are different when working with librarians who are not primarily health sciences librarians. The priority for health sciences librarians is health and biomedical information, but the priorities for PUI and TCU librarians are much more diverse. They often have more college responsibilities and are more broadly involved in the lives of their institutions than are most health sciences librarians.

Since the PUI and TCU librarians provide generalist reference services to their entire campus, there is a direct impact on the amount of time that they can devote to learning about or becoming proficient in biomedical research resources. Their time for doing any type of outreach to others in their communities is very limited, and their budgets do not extend beyond the programs offered by their colleges. When working with librarians under these constraints, one must be patient, consistent, and understanding of their situations. Being willing to listen and learn are key ingredients for health sciences librarians seeking to gain the confidence and participation of librarians working in different types of libraries.

In addition to the aforementioned constraints, PUI and TCU libraries are prone to fewer staff than most academic libraries. The 2010 National Center of Education Studies report indicates there are on average 2.66 professional librarians per academic library in South Dakota, while the national average is 7.84 per academic library.[23] Tribal colleges experience the challenges that smaller institutions face but to a greater extent, such as problems retaining staff and faculty.[24-26]

At the time this article was written, SD BRIN tribal colleges were not staffed with librarians having an LIS degree. Outreach and collaboration are major goals of SD BRIN, and LILs frequently work with tribal college libraries to provide support services such as reference and training. One comment in the survey from a tribal librarian expresses "we have been very fortunate to have assistance only an email or phone call away that has provided us with fabulous help and the librarians are always so kind and patient with us."

Reference Questions

The network librarians reported that they do not receive many molecular biology reference questions. They indicated that typical questions might involve access issues, or what SD BRIN databases their institution subscribes to. SD BRIN LILs also encounter these types of questions from their researchers, but because the lead institution includes schools of medicine and health sciences, they receive the gamut of research related inquiries—from simple location queries to complex search strategies. NIH public access policy and compliance questions from the administrative core are another type of question SD BRIN LILs deal with. The network researchers generally will generally contact their local librarian with their research needs, and this is encouraged. However, because the LILs participate in the SD BRIN steering committee and meet on a regular basis with each institution's research representative, network researchers will on occasion directly contact the LILs with queries. We consider this a teaching moment, and will always include the network librarian in the process of resolving an SD BRIN researcher query.

PubMed

Only one of the librarians surveyed mentioned the use of PubMed (http://pubmed.gov) as a molecular biology resource they use. This could indicate a lack of awareness or confidence in searching this database. As the only free world-wide biomedical database, PubMed should be considered a key reference resource. There are a few possible explanations for the survey results. The survey did not explicitly list PubMed as a resource from which to choose—it specified "non-bibliographic" resources such as National Center for Biotechnology Information (NCBI) databases. This suggests that the librarians might not think of PubMed as an NCBI resource, or they could be unfamiliar with these resources and simply don't use them.

Training

The survey results showed that PUI and TCU librarians do not often work directly with biomedical researchers. However, they are interested in training and other support opportunities the SD BRIN LILs might offer, e.g. NLM database training, that could help them better understand the information challenges of INBRE researchers and how to better serve them. An example of group librarian training activities is articulated when in 2005, trainers from NLM conducted a health information community workshop at the Oglala Lakota College library (one of the SD BRIN TCUs), in Kyle, SD, on the Pine Ridge reservation. The lead author of this article was invited to this training session. Of particular value was the opportunity to keep up to date with NCBI resources, which is important in support of biomedical researchers. This was also an excellent chance for networking.

Face-To-Face

The authors have conducted on-site SD BRIN resource training at Sisseton Wahpeton College, Agency Village, SD, on the Lake Traverse reservation. Face-to-face interactions are important at

TCU institutions because of access, technology and connection issues presenting challenges with

virtual presentations. It was discovered at one of the training sessions that the campus was not

able to access some of the SD BRIN resources. Upon further investigation it was discovered that

the campus anti-virus program was causing the access problems. Other issues have involved IP

changes and network providers. Some TCUs contract with local network providers, while others

use the Bureau of Indian Affairs services. Each case is unique and must be approached on an

individual basis rather than expecting one set of instructions to fit all. Sometimes the librarians

had little knowledge of how their systems worked, and it was more effective to work with the IT

staff to set up access.

In a CoP, as Knapp suggests, the social dimension of librarians exchanging information and

engaging in wide ranging discussions with colleagues is significant.[27] Face-to-face interactions

are critical to developing relationships and building communities.[19] To understand the needs of

the targeted population and to position the library as a respected institution within the CoP,

librarians must sometimes leave the library, go into the community, and directly work with a

population to train or resolve issues. While most libraries strive to provide online access to

resources and information, there is frequently no substitute for comprehensive, face-to-face

outreach, especially in TCU settings.

FUTURE COLLABORATION

Web 2.0 tools are promising to be a good fit in CoPs for support and training. Many libraries

already have implemented social networking platforms to manage and exchange information.

Moore et al[19] and Rodriguez[28] describe academic libraries that use blogs for internal

communication among reference librarians, building knowledge of institutional practices and

procedures. In addition to blogs, Currie suggests that other Web 2.0 tools such as wikis, shared

calendars, online photo sharing platforms, and social bookmarking tools might be effective for

coordinating communication in a CoP.[29]

The authors of this article created an SD BRIN LibGuide <http://libguides.usd.edu/sdbrin> to

connect the librarians, researchers, and students in the network to licensed databases and

journals, and to provide links to tutorials and past training information such as PowerPoint

presentations. LibGuides <LibGuides.com> is a well-known application that connects patrons to

research information in a flexible, easy to use Web 2.0 platform. In the future, we would like to

set up a wiki or blog to keep the SD BRIN network updated on database news, research tips, and

upcoming training. An RSS Web feed syndicating the blog/wiki information could be imbedded

into the SD BRIN LibGuide, keeping all the research, reference, and instruction information in

one place. In effect, this archived information would form a shared knowledge base; an enduring

characteristic of a CoP. Embedding chat functionality into the LibGuide is another means of

communication which would allow everyone in the SD BRIN research network to address

concerns with librarians in real time.

The current iteration of the SD BRIN LibGuide is focused towards researchers in the

network. To support the librarians, a "Just for Librarians" tab on the LibGuide is being planned.

It could include more extensive PubMed tutorials, list training opportunities that the NN/LM

provides, and provide tutorials and links to more information on Web 2.0 tools. One example of

a promising collaboration tool is Google+ Hangouts < http://www.google.com/hangouts>, a

free video chat service from Google that enables both one-on-one chats and group chats with up

to ten people at a time, focusing more on "face-to-face-to-face" group interaction.

To further address training interests expressed by survey respondents, a CoP model would advocate for more group sessions with as many of the librarians as possible who could meet together. An opportune venue would be the state library association convention, but many budgets are tight and travel is not always possible. Further research is needed in areas such as leveraging minimal librarian support in a research network, and additional ways academic health sciences librarians can provide training and virtual services to researchers and librarian colleagues within PUIs and TCUs, perhaps with extramural support for enhanced IT services.

CONCLUSIONS

Health sciences librarians everywhere are struggling to find meaningful ways in which they can participate in the research enterprises at their institutions. This article describes the realities of providing library services to a wide range of biomedical researchers in very different kinds of institutions as part of a small network. The community of practice is a promising model for those librarians in smaller-sized academic libraries who navigate between broad and narrow subject areas. Every library works in a different environment and must develop programs based on local needs and capacity. Libraries establish roles based on the needs of their clients and the abilities of their staff. This type of interaction is a continuum rather than a hierarchy, meaning that no one role is greater than another. By working together and sharing resources, information, skills, and knowledge, librarians of all backgrounds can work together as a community to support the information needs of biomedical researchers in under-financed areas who are carrying out crucial research.

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