

Models of Embedded Librarianship:

Addendum 2011

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Corrected Version

Table of Contents

Acknowledgement..... 3
Introduction 3
Site Visit 1 6
Site Visit 2 11
Site Visit 3 16
Site Visit 4 22
Site Visit 5 28
Site Visit 6 34

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Introduction

This addendum supplements the Models of Embedded Librarianship Final Report, which is available from the Special Libraries Association at <http://www.sla.org/pdfs/EmbeddedLibrarianshipFinalRptRev.pdf> . The original goals of the project were to:

- Define indicators of success and identify successful (model) programs
- Collect data about the practices followed by model programs in initiating, operating, and evaluating their services
- Develop recommendations for other librarians seeking to implement embedded services.

Indicators of success have been analyzed in the original report and three journal articles.

The purpose of this Addendum is to further explore the practices of successful embedded librarianship programs and enrich our understanding of the strategies and tactics associated with success. The method is that of qualitative case studies. The aim was to gain a thorough understanding of a limited number of successful embedded librarianship programs from the perspectives of librarians, library managers, information users, and senior managers or information user group managers, with a special focus on management practices.

Six organizations were analyzed. They represent a mixture of organization types: a research university, a community college system, a for-profit university, a not-for-profit corporation, a privately held large multinational corporation, and a for-profit professional services firm. The requirements for participation were that the organization had initiated its embedded librarianship program no less than five years ago, thus demonstrating longevity, and that it showed indicators of sustained success over the period, such as increasing demand for embedded librarians and/or expanded diversity and sophistication of their role.

Site visits were made to each of the six organizations during June, 2011. Site visits were typically one day long, but in one case the visit extended to two days. In several cases, followup telephone interviews were conducted with staff not available on-site during the visits. In each case, multiple staff with different roles were interviewed. Typically, those interviewed included library managers, embedded librarians, non-library managers, and non-library staff who had collaborated with embedded librarians. In one case, an unexpected scheduling conflict precluded meeting with non-library personnel. The number of separate interviews held at each organization ranged from two to six. Individual interviews were preferred, but several group interviews were held to accommodate the schedule needs of

Models of Embedded Librarianship: Addendum 2011

interviewees. Most interviews lasted about an hour, but several group interviews ranged up to two hours.

Interviews were semi-structured. A broad outline of topics was used in each interview, regardless of the role of the interviewee or other factors. The outline topics included:

- Briefly describe the role of embedded librarians in your organization. Where are they embedded?
- What kinds of contributions do they make? For example, do they perform any of the following:
 - In-depth research and analysis
 - News alerting
 - Competitive intelligence
 - Information literacy instruction embedded in an academic course, or co-teaching with a member of the instructional faculty
 - Content management for internal communities or public audiences
- How is the availability of embedded librarians communicated to others in the organization? Are there any systematic communications about what they do and how to engage them? (If you are a user of the embedded library services, how did you find out about them?)
- What is expected of embedded librarians? How is their work evaluated? How do you know if embedded librarians are meeting or exceeding expectations, and having the desired impact on the organization? If there is a formal evaluation process, who participates in or contributes to it?
- How do library/information service managers and managers of information user groups participate in guiding and directing the work of embedded librarians? For example, how are the following management issues addressed:
 - Mentoring new embedded librarians and integrating them into the work of the groups they are embedded with
 - Supporting the professional development of embedded librarians
 - Management coordination between library/information services management and management of the information user group

Interviewees were encouraged to respond at length to the questions, and in every case rich discussion of embedded librarianship ensued. Face to face interviews were recorded to aid in the subsequent analysis and synthesis, but telephone interviews were not recorded.

The following are the summaries of the six site visits. Each summary contains the following sections:

- Background: brief summary of the organizational context
- Embedded Librarian Engagements: Overview of the organizational units and information user groups in which librarians are embedded
- Nature of the Librarians' Contribution: Nature of the work performed by embedded librarians
- Communication and Promotion: How members of the organization are informed about the embedded model
- Evaluation: How the work of embedded librarians is evaluated

Models of Embedded Librarianship: Addendum 2011

- Management Advocacy: How information user group managers and senior organizational leaders support the embedded model
- Management Advocacy – Library Management: how library management supports the embedded librarians and develops the embedded model.

It is hoped that these summaries will prove to be a rich source of ideas and guidance for others seeking to establish embedded librarianship in their organizations. Future publications will analyze the cases to extract common themes as well as differences between the six cases, and compare these findings with the findings of the original Models of Embedded Librarianship research report.

Site Visit 1

Background

Site visit 1 was held at a medium-sized private, independent technological university located in the northeastern United States, during June 2011. Interviewees included a Reference & Instruction Librarian, the Dean of Libraries, the Dean of the institution's Global Studies Program, and the Associate Dean for First Year. This visit was a followup of a site visit conducted during 2009. (See Shumaker and Talley, Models of Embedded Librarianship Final Report, Appendix B, Site Visit 2 at <http://www.sla.org/pdfs/EmbeddedLibrarianshipFinalRptRev.pdf> .)

Embedded Librarian Engagements:

Since the time of the initial research visit in 2009, the embedding of librarians in academic courses has grown significantly in extent, though the nature of librarians' contributions has not changed significantly. The primary engagements are in two programs, the First Year "Great Problems Seminar", and the upper-level Global Studies Program. In 2009, librarians were engaged in the Great Problems seminars on a pilot basis and in a fraction of the Global Studies Program seminars. One librarian had primary responsibility for both programs with backup from one other librarian. Now, all students in both programs have access to the benefit of an embedded librarian, and five librarians share the embedded role as an exclusive or primary responsibility.

Engagements have also been added in other courses and programs.

One librarian provides specialized instruction in market research sources and techniques for courses in Engineering Design. This is a family of similar courses in various engineering disciplines in which students develop a product or solution to a problem. The librarian's role includes leading a two hour lab session, and providing a followup assignment. The results have been evaluated using a pre- and post-test methodology. (See details under Evaluation below.)

One librarian has begun to meet regularly with faculty and students in Aerospace Engineering to learn more about their work, especially students' major projects, in order to strengthen her research guidance to them.

A recently hired librarian has begun to develop relationships and embedded course participation with Business programs. The institution's Executive MBA program is delivered primarily through distance education with some on-campus visits. The librarian is involved in the on-campus visits.

The library staff are also strengthening their outreach to academic departments. They have developed newsletters geared to department interests, and in one case a librarian is moving from ad-hoc consultation on student projects to regular attendance at departmental "Major Qualifying Project" meetings at which students must present their plans and give progress updates.

Nature of the Librarians' Contribution

Models of Embedded Librarianship: Addendum 2011

The librarians' contribution in both major engagements, the "Great Problems Seminar" and the "Global Studies Program", includes delivering general information literacy instruction in a classroom or through online tutorials, and performing in-depth, customized counseling in research sources and methods for student project teams.

Students may enroll in a "Great Problems Seminar" during their first year. Taught by a team of two faculty, each seminar takes an interdisciplinary approach to a specific topic deemed to be of great significance. Different seminar sections address different topics. Librarians deliver information literacy instruction in class meetings, generally in the early part of the term, and provide guidance, tutorials, and instruction through the course management software using tools such as Adobe Captivate and LibGuides. Each student team is assigned a "personal librarian" who consults with the team as it conducts its research. Each team presents a poster at the end of the term. Not all teams consult their librarian: it is an optional step, and participation varies.

In the "Great Problems" seminar, librarians prepare for their role by meeting with faculty to plan their participation in the course. The goal is that the librarian will visit classes regularly and offer consultations. The timing of the librarian's participation is customized to match the schedule of course assignments. Resources are selected and taught based on the subject matter of the course – they are targeted to the specific theme of the seminar. Source guides are produced using LibGuides and made available in the institution's course management system.

The second embedded engagement reaches students during the junior year. During the junior year, students may participate in the Interdisciplinary Global Studies Program. Student teams develop proposals for field projects to be undertaken. While the projects relate to the students' majors in various engineering disciplines, the proposals must take into account multidisciplinary factors: not just engineering and technology but also social and cultural factors. Successful teams then travel to locations across the United States or internationally and carry out their projects. The need to master diverse information sources and leverage information on a range of issues combine to make this a challenging research assignment. Embedded librarians guide the student teams through the research and proposal process. The teams first complete a tutorial geared to the project location they are interested in, then they review a website with background information, then they have one or more research consultations with the librarian assigned to their location.

In the past two years, the Interdisciplinary Global Studies Program has grown. More off-campus locations have been added, and more students now participate in it – approximately half of undergraduates. Also, librarian participation has grown and broadened, and now five librarians participate. Each librarian has developed expertise in a specific area. The librarians' contributions include developing websites with information relevant to project locations, guides to information resources, and most importantly, to serve as research counselors to project teams. In the Global Studies Program, librarians are seen as agents of the interdisciplinary approach that the program requires. In the words of the Dean who leads the program, "faculty are outside their comfort zone" and the "librarians are good at learning about unfamiliar areas." Two librarian contacts are scheduled in each class. The librarian meets with the class at the beginning of term, and then consults with project teams.

Models of Embedded Librarianship: Addendum 2011

Faculty have invited librarians to be present for the students' final presentations, and one has asked librarians to provide input on evaluation.

Communication and Promotion

There is a multipronged approach to promoting the embedded librarianship program. It includes the following elements:

Librarians participate in new faculty orientations and describe the program. They follow up by holding individual meetings with faculty. These are often informal, such as meeting for a cup of coffee.

Library managers publicize services at faculty meetings. Outreach and in-reach work (programs in the Student Center, programs in library) involves the library staff as well as managers.

For the Global Studies Program, there is an annual meeting of faculty participating in the program. The Dean of the program invites a member of the library management to present the embedded library service at that meeting.

For course engagements, collaboration with faculty takes place largely by email. The librarian assigned to the course contacts the faculty after doing background research and looking at the course syllabus, so that discussions can focus on substantive issues.

In addition to all these communications, "word of mouth" communication plays a very large role. Faculty who have experienced the embedded librarians' work are uniformly enthusiastic supporters, and communicate their support to others. Faculty who teach in the Great Problems and Global Studies programs may tend to be individuals who are more open to collaboration with librarians and others. In addition, the Great Problems seminars are team-taught and also incorporate collaboration with the institution's Information Technology organization, so collaboration is natural, and the embedded librarianship initiative aligns well.

There was strong consensus among interviewees that the embedded librarianship model has become "baked into" the academic culture. Involvement of library services is considered in all initiatives. Understanding of the librarians' contributions is widespread.

Evaluation

In the Interdisciplinary Global Studies program, students routinely complete course evaluations, and often single out librarians for praise. In the past it was possible to compare outcomes for students who had worked with librarians to outcomes for those who had not. These comparisons showed that librarians had a substantial positive impact. With the increasing coverage of all student teams, this is becoming less meaningful. There is a strong perception that students who participate in the program gain skills and abilities that they continue to use in their subsequent careers, and that differentiate them from students who do not participate. One of those skill areas is information literacy, and the embedded librarians are given credit for much of that success. The Dean considers the participation of embedded librarians a "no brainer" and characterizes the exposure to research sources and methods as an "eye-

Models of Embedded Librarianship: Addendum 2011

opener” for students. The Dean believes that library staff have contributed beyond expectations. In a course where all participants – faculty, librarians – are outside the comfort zone of traditional concentration on disciplines and skill sets, and in which the instructor isn’t simply the fount of knowledge, librarians have essential skills – curiosity, resourcefulness – to teach and contribute.

In the Engineering Design course mentioned above, pre- and post-tests have been used in the past to assess the impact of information literacy instruction. In the future, a more systematic approach is planned.

In the first-year Great Problems Seminars, a pilot project in 2010 engaged a team of students in developing and administering an assessment of information literacy skills. The instrument is undergoing revision, and there are plans to administer a revised assessment in the coming year. The project will be assigned to a student team co-directed by the Dean of Undergraduate Studies and the Library’s Associate Director for Research and Instruction. Students not taking the Great Problems Seminars have also written in their course evaluations for other courses that they have learned skills from friends taking the Great Problems Seminars – in other words, information literacy skills are being passed on among students by word of mouth. There is an initiative to start doing pre- and post-tests for students in the Great Problems seminars. An anecdote of a positive outcome in one Great Problems seminar was shared: in this seminar, thanks to faculty insistence, 90% of the students took advantage of the opportunity to work with their “personal librarian” for the course – a much higher percentage than usual. The instructor judged the research papers as being of exceptionally high quality and attributed much of the success to the influence of the librarians.

There are also plans to conduct an ethnographic study, as other universities have done, which will focus on the research behaviors of student project teams. This study will also be co-directed by the Dean of Undergraduate Studies and the library’s Associate Director for Research and Instruction.

Other forms of assessment under consideration are the LibQual+ survey, and other plans being considered by faculty in the First Year and undergraduate studies areas. In addition, self -assessments may be incorporated into online tutorials.

Finally, the campus library’s walk-in traffic has doubled in the past five years, and it is speculated that the high visibility and success of embedded library services is one factor that has contributed to this dramatic increase.

Management Advocacy

Deans and academic administrators advocate for the library because they recognize the value that librarians are contributing to their programs. They have encouraged department heads and faculty to expand librarian engagement in departments. Librarians are invited to department meetings and have been well received. Limited support is provided for continuing education on disciplines by librarians.

Models of Embedded Librarianship: Addendum 2011

The course participation of embedded librarians is reinforced by alignment with course goals. For example, information literacy has been established as one of course objectives of the Great Problems seminars. Embedded librarians are also aligned with a dominant collaborative approach in the teaching culture of the institution.

The library directorship has been elevated to Dean level. A recent reorganization has placed the library in Academic Affairs, reporting to the Provost. The Library Dean sits on Deans' Council and is positioned to engage library in initiatives as appropriate. The Dean of Undergraduate Studies and the Dean of Libraries have jointly proposed expanding the role of librarians in the Interdisciplinary Global Studies Program. This step, if accepted, will raise the issue of backfilling and providing increased "bench strength" as the embedded librarianship program expands.

Management Advocacy – Library Management

The Library has not added positions in the past two years. Instead, resources to expand embedded services have been found by realigning positions. One position has been shifted from technical services, and duties of public services staff have changed. The Dean of Libraries has addressed staff concerns by one on one meetings with each affected staff member to discuss the changes, the individual's strengths and concerns, and to build confidence in the changes that have taken place.

The Dean of Libraries sees several challenges ahead as the library builds on the success of its embedded librarianship initiatives. They include:

- Continuing to work on overcoming traditional conceptions of library role as a support service, passive resource, among some senior academic administrators.
- Increasing bench strength and organizational flexibility as embedded librarianship engagements grow, with limited overall staff growth
- Ensuring that all students receive information literacy instruction and achieve information literacy goals. Currently, only ¼ to 1/3 of students take the first-year Great Problems Seminars. Also, not all are engaged in Interdisciplinary Global Studies. This means that some students are not being reached, and the gaps need to be filled.
- Continuing to develop assessments. The Great Problems Seminar course assessment is in progress. Currently, faculty are surveyed and provide their impressions. They see student progress in a variety of areas, including information literacy. Great progress has been made in information literacy, student awareness of information resources, and research skills, but the progress needs to be documented and ongoing evaluations developed.
- Continuing to fill new needs. Two of these are research projects and graduate programs. Librarians are not yet embedded in research projects. Data curation is clearly needed and an obvious opportunity. The work of embedding in graduate programs is just beginning with recent outreach to the business school.

Site Visit 2

Background

Site visit 2 was held at the administrative office of a statewide community college system during June 2011. Interviewees included three Reference Librarians, the Assistant Director of the Library, the Dean of Academic Affairs, the Coordinator of Academic Services in the Center for Online Learning, and two part-time professors. (All faculty in the college are part-time.)

The College operates a number of campuses around the state, and provides both face-to-face and distance instruction. Library services are provided by a unified library staff under the direction of the Director of the Library of a sister institution in the state higher education system. This Library serves as the physical library for the community college system, and embedded services for the community college system are led by the Assistant Director of the Library.

Embedded Librarian Engagements

Librarians provide information literacy guidance and counseling to students in a variety of courses. There are no specific courses that are required to have an embedded librarian, but there are several that are especially well suited to the librarians' participation. They include Dimensions of Learning, a required course taken at the beginning of the student's program; English Composition; Introduction to Research Methods; and the Seminar in Educational Inquiry, a capstone course required for graduation that has an information literacy learning objective.

Since 2009, all librarian engagements have been virtual, using course management software. Librarians participate in online courses, which constitute about 20% of community college offerings, and in the online component of face-to-face courses. Online courses account for 50% of embedded librarian engagements; librarians are embedded in about 20% of courses overall.

Embedded librarians do not specialize in specific disciplines, but often they maintain relationships with individual instructors. If an instructor has worked successfully with a librarian in the past, the same librarian is assigned to work with the instructor again, if possible. It's notable that the College does not have the formal departmental structure typical of traditional four year higher education institutions, so that the need for librarians to develop subject specialties in order to align with the structure of the academic organization is reduced.

A collection of online information literacy tutorials has been created and is accessible outside the embedded service, but many students and faculty are not aware of them. The ability to link from within course makes them visible and relevant.

Nature of the Librarians' Contribution

Depending on the course, librarians may provide any or all of the following:

- Introductory and followup postings in the course management system on research techniques and suggested information resources. During the course of a term, these postings are

Models of Embedded Librarianship: Addendum 2011

proactively timed to coincide with student work; the librarians do not wait until students ask questions.

- Collaboration with faculty on syllabus development and development of customized research assignments.
- Online tutorials on information literacy topics.
- Information scavenger hunts and other exercises.
- “Guest Lectureship” for one week during the term, in which the class work focuses on information literacy.

The most common contributions are informational postings initiated by the librarian, and communications between the librarian and individual students. Some faculty members infuse library skills and resources into the course assignments and actively refer students to the librarians. A few require students to consult the course embedded librarian.

Two examples illustrate the nature of collaboration between faculty and librarians:

In an Introduction to Nutrition course, a new faculty member engaged an embedded librarian and collaborated with her in preparing the course. The librarian helped refine the major research assignment of the course. When the course began, the librarian participated actively in the course management system by posting information literacy guidance. The librarian directed students to available online tutorials and counseled them through a chat forum included in the course management system. The course included small research assignments that helped the students develop the research skills needed for the major research assignment, and the librarian was instrumental in counseling students on research strategies for those assignments. The instructor estimates that 10% of the students engaged actively with the librarian. She is able to judge this because she is able to monitor the chat forum communications. This instructor is now teaching the same course again, and working with the same embedded librarian. Because of the relationship and trust that have been developed, less coordination was required in course planning. Instead, the instructor is better able to articulate to students the benefits of engaging with the embedded librarian, and has made a point of emphasizing the benefits early in the term. She believes the number of students engaging with the librarian has doubled.

A new instructor was assigned at short notice to teach a section of the Introduction to Research Methods course. This course covers primary research methods, both qualitative and quantitative, as well as secondary research. Thus, it has a significant library research component. While reviewing the course management system, she saw a notice about the embedded librarian service. She requested an embedded librarian, and was assigned a librarian who had taught the course in the past, on a separate contract apart from her library duties (and has continued to teach it). Because of her background, the librarian was able to provide assistance in preparation of the course. The instructor required students to consult the librarian, and required them to submit copies of their messages with the librarian to document their engagement. The librarian sent welcoming messages to students early in the term and maintained a presence in the course management system. The course met face-to-face in a computer lab. Because of the connectivity afforded by the lab, the librarian was virtually present during class sessions, and was consulted heavily especially during class time devoted to library research exercises.

Models of Embedded Librarianship: Addendum 2011

Students were permitted to choose their own topics for research papers, and the librarian guided their selection and reviewed their topics to ensure that the scope was appropriate and the plan was feasible. The instructor characterizes her relationship with the librarian as that of “colleagues in teaching the course.”

Communication and Promotion

For a new faculty member, the first communication on the embedded librarian program is likely to come from the Dean of Academic Affairs or an Associate Dean. All new faculty are required to participate in a four hour workshop, led by the Dean or an Associate Dean, which includes a presentation on the embedded librarian program. The embedded librarian capability is also highlighted in communications from the Dean and in other meetings and training sessions for faculty members.

As an ongoing, regular channel, all faculty receive an email from one of the librarians before the beginning of each term. Faculty members who wish to engage an embedded librarian are directed to a web form. When the completed web form is accessed by the library staff, one of the librarians is assigned to the course, and that librarian contacts the faculty member.

In addition to these formal mechanisms, the librarians believe that word of mouth communication between faculty has been an important element in acceptance of the program.

Separate communications strategies are used to reach students, and some of these involve faculty members. Critical success factors in reaching students include:

- Effective advocacy by the course instructor. The Introduction to Nutrition instructor cited her growing ability to advocate that students seek the librarian’s help as contributing to a doubling of the percentage of students contacting the librarian, and improving students’ confidence and skill in conducting research.
- An ongoing relationship between the embedded librarian and the students in a course. The Introduction to Research Methods instructor contrasted successful student engagement with the librarian to less successful student engagement with an “e-tutor” service. The librarian was introduced early, participated regularly and communicated effectively. Students came to feel that they had a relationship with “their” librarian. In contrast, the e-tutor service was an anonymous service to help students with writing skills. Students could submit drafts to the service and receive comments. However, there was no personal point of contact. The instructor found that students not only appreciated the embedded librarian more, but also received much more effective help.

Evaluation

The library staff have made some progress in evaluating the effectiveness of embedded librarians, and are continuing to improve their evaluation measures.

In the Nutrition course example given previously, the instructor evaluated the librarian’s contribution by correlating student performance with student engagement with the librarian via the

Models of Embedded Librarianship: Addendum 2011

course chat forum. She found that those students who sought help had better outcomes than those who did not. In the second term working with the librarian, the instructor found that introducing the librarian early and utilizing the librarian's presence systematically has substantially reduced initial student confusion about research strategies and the amount of class time spent discussing problems and concerns about the research component of the course – freeing more time for work on the subject matter of the course. The instructor is convinced of the value of the librarian's contribution to the design, process, and student outcomes of the course.

In the Research Methods course, the instructor evaluated the librarian's contribution in two ways. The first was the librarian's collaboration in planning the course, which was invaluable given the instructor's newness and the short lead time to prepare. The second was the librarian's effect on students' library research skills, which the instructor monitored by reviewing the communications between students and the librarian. The instructor's overall assessment of the librarian's role was very favorable.

The library staff have not yet done a systematic assessment of their impact on learning outcomes. They are currently exploring the possibility of making a systematic assessment using data on student performance collected by the College administration. The proposed methodology would be to compare the performance of students who have enrolled in classes with an embedded librarian to the performance of those who have not. The hypothesis would be that students who have experienced the embedded librarian show improved performance. There is an initial impression that recent trends in improved student performance, especially in the Seminar in Educational Inquiry, coincide with increased engagement of embedded librarians.

Management Advocacy

The Dean of Academic Affairs has been a strong advocate for the embedded librarianship program. The Dean actively led a change in the information literacy instruction model two years ago. Previously, librarians regularly traveled to regional campuses around the state to deliver guest lectures – so-called “one shot” information literacy lectures. This was recognized as very time-consuming and expensive. Because the librarians spent a great deal of time traveling, they had limited time for actual course participation, and so the in-person model was perceived as expensive and ineffective. The Dean and the library management therefore decided that librarians would no longer travel, but would provide tutorials and embed themselves in course management software. This change was initially resisted by some faculty, and strong advocacy by the Dean was required to ensure its successful implementation.

Currently, the Dean advocates the embedded model by ensuring it is presented in orientation sessions for new faculty that are led by her, or by one of the Associate Deans in her absence. She also uses email to encourage faculty utilization of the embedded librarians. She has recently brought the Assistant Director of the Library into the Academic Council, which is made up of the Deans and Associate Deans as well as academic staff, faculty members and a student representative. This move will enable the library manager to contribute to policy development in information literacy as well as other matters.

Management Advocacy – Library Management

Models of Embedded Librarianship: Addendum 2011

As noted above, the library Assistant Director has joined the Academic Council, where she will be able to contribute to academic policy and initiatives including but not limited to information literacy. This coincides with a review of information literacy standards at the systemwide state college level.

The Assistant Director also cites the library organization's close working relationship with the Information Technology Department, ability to gain authorship rights in the course management system, and autonomy in managing its own website, to add videos and tutorials, as key organizational relationships that support the embedded librarianship model. Another key alliance is a strong informal collaboration with academic coordinators, who coordinate the recruitment of part-time instructors.

A strength of the embedded librarianship program has been its alignment with a College-wide learning objective on information literacy. Embedded librarianship has been especially well received in the Seminar in Educational Inquiry capstone course and other courses that have an information literacy course objective. A recent academic retreat of representatives from all state colleges was devoted to the topic of information literacy: how to integrate objectives across the curriculum, and how to assess it. The Assistant Director's inclusion in the Academic Council will afford the opportunity to contribute to this systemwide initiative.

Currently there is a challenge in reaching all students, because of some inconsistent requirements. Some changes under discussion for the future would include the use of an information literacy tutorial in a first semester course, and an anonymized assessment of capstone research papers, to be conducted every other year.

The College has found that the embedded model is time consuming, and there continue to be concerns over resources – hence the importance of evaluation, and of ongoing innovation. The model may be a major shift in mindset for librarians at other institutions used to a traditional library environment. However, the community college librarians focus exclusively on their embedded role, and they have embraced embedded librarianship as a natural outgrowth of the expansion of the college's online courses, and an efficient solution to the challenges of serving a geographically dispersed community.

Site Visit 3

Background

Site visit 3 was held at the offices of a not for profit corporation that specializes in systems engineering, information technology, operational concepts, and enterprise modernization, during June 2011. Interviewees included a Senior Information Analyst, a Team Lead for Knowledge Services, the Manager of Information Services, and the Director of a corporate office that focuses on the discipline and practice of systems engineering.

Embedded Librarian Engagements

Most of the corporation's work is done for the government of the United States. The Information Services Department employs sixteen librarians who have embedded relationships with information user groups. These relationships involve a mutual commitment in which the information user group provides funding and the Information Services Department allocates staff time to meet the user group's needs. Embedded librarians have relationships with all major operating units of the corporation.

Some embedded relationships involve a single librarian who is assigned to a specific information user group. Other embedded relationships involve "clusters" of librarians. A cluster is an informal community of librarians who participate in meeting the information needs of an information user group. A typical cluster is led by a senior information analyst (librarian) who is embedded with the information user group and coordinates the relationship with that group. Other librarians participate in the clusters to provide backup and workload sharing, and to increase their understanding of the subject area and the needs of the information users. Librarians typically belong to more than one cluster; the average is three clusters. Clusters often align with key domains that are strategically important to the corporation. While the senior analyst performs much of the embedded work, has the strongest working relationships, and has the greatest knowledge of the user group's work, others are sufficiently connected to step in effectively as needed. The goal is to achieve a balanced approach that combines an embedded librarian with backup and coordination for support, and builds collaboration among librarians.

The embedded librarianship program continues to expand. Embedded staffing levels have grown by over 10% in the past 5 years.

The site visit focused on one engagement. A single embedded librarian works with the corporate office that focuses on the discipline and practice of systems engineering ("the Office") on a nearly full-time basis. The engagement encompasses a variety of knowledge management tasks. The librarian, who has the job title "Senior Information Analyst" has been embedded with the Office for approximately ten years. The librarian initially learned on the job, by taking internal seminars and other opportunities, by being invited to technical meetings (as a recorder) and thereby gaining exposure to the subject domain and meeting the members of the group and other important contacts.

Models of Embedded Librarianship: Addendum 2011

Nature of the Librarians' Contribution

Embedded librarians perform a wide range of functions related to the management of internally-created knowledge and the effective use of externally-sourced information. These functions include:

- In-depth research and analysis
- News alerting
- Retrieval and analysis of information on technology businesses and markets
- Limited information literacy instruction
- Content management for information user groups on a variety of internal platforms.

Most embedded relationships have a strong emphasis on highly targeted news alerting. There is also a growing emphasis on the librarian's ability to perform analysis as part of the in-depth research process. Increasingly, embedded librarians are using analytical tools to characterize and synthesize search results before communicating the results to the information user groups.

For the office, the embedded librarian performs a variety of functions related to knowledge management. The librarian edits and distributes a news alerting service on the discipline of systems engineering which is received by about 500 engineers internally. The librarian is trusted to make good judgments in evaluating the importance of news items to go into the distribution. The librarian is also content steward for several internally-produced digital resources that are widely used by staff across the corporation to ensure that they use the best available systems engineering practices, as well as a publicly accessible web content repository. The librarian also operates a question-answering service, receiving questions from staff throughout the corporation as well as fielding questions from outside of the corporation that come in through the Office's presence on the corporation's public web site, answering some, and referring others that demand in-depth systems engineering knowledge to staff experts, and making sure all questions get answered in a timely way.

Because the delivery of news alerts is both highly valued in many embedded engagements, and very time consuming, the Information Services Department management has focused on streamlining this function. In the embedded engagement for the Office, the librarian and the Team Lead reinvented the news service, streamlined the process, and reduced the time required to produce it. They introduced an artificial intelligence capability, using commercial software to aid the editorial decision process. The new tool and process are now being introduced in other engagements throughout the corporation.

The production of other news alerts has been outsourced. The embedded librarian/cluster leaders continue to manage relationships with outsourced providers. The role of managing outsourcing relationships and coordinating "clusters" has raised the complexity of embedded librarian tasks and some librarians have been promoted to a higher job grade as a result. Both the use of the automated tool, and outsourcing, are used to free up the embedded librarians to participate in more projects and work more closely with their information user groups on high priority projects.

Models of Embedded Librarianship: Addendum 2011

Embedded librarians add value in important ways that go beyond the content they make available. For the Office, the librarian also contributes by articulating unique perspectives on its projects and applying unique skills to them. The librarian is sometimes aware of resources and methods outside the Office that are relevant to its work, and is able to bring them to bear. For example, the librarian has been able to connect the systems engineering projects with the internal knowledge management community, to benefit the overall work of the Office and the corporation.

The librarian's knowledge of the Office, built up over a number of years, has been invaluable to the Director and others who are new to the organization. The librarian has provided a "point of view about the history of the Office that was extremely valuable," and the Director seeks to "get [the embedded librarian] involved in whatever's hot, or whatever's new." The librarian combines an understanding of the Office's needs, its role in the Corporation, his own role, and knowledge management principles that is very valuable. In one example, the librarian led the development of changes to ensure that an important corporate membership in a technical standards organization, for which the Office was the focal point, was effectively leveraged for the benefit of interested engineers in various units of the organization.

In a key system development project to build a catalog of analytic tools for internal use, the librarian contributed by advocating a balancing of contributor/producer and user/consumer inputs, helping to conduct a survey to assess needs, and organizing the results for the team to consider in developing the system. The librarian added "a different way of thinking about the problem space," says the Director, as a "professional in the knowledge management business".

Communication and Promotion

The Information Services Department uses a variety of methods and media to communicate about the embedded librarianship program. The department's site on the corporate intranet describes Custom Research and Knowledge Services, including the capabilities provided by embedded librarians. Department management generates news items in the employee newsletters and is working on a video presentation. They also make presentations to key groups, such as new project leaders who have been awarded funding in the Corporation's internal research and development program. Still, the department manager notes that "the repeat customer is the bulk of our business."

Embedded librarians generally see the specific opportunities first. The lead information analysts who lead the cluster groups and coordinate the embedded relationships with a specific information user group are responsible for communicating the availability of embedded librarians and matching opportunities and needs with available librarians. Cluster leaders meet regularly with key contacts – sometimes as often as every other week – to go over current assignments, discuss progress, and plan for forthcoming needs.

In the case of the Office's embedded librarian, the librarian initially promoted the embedded role through physical proximity and by taking an active role in the work when the opportunity presented itself. The librarian inherited an ongoing but low-level assignment to work with the organization. The relationship became much stronger when the librarian's office was moved to the Office's area and the

Models of Embedded Librarianship: Addendum 2011

librarian had the opportunity to interact informally with members of the core team. The librarian then entered a period of “trial by fire” – rapid on-the-job learning with increasingly responsible assignments. The librarian managed a physical library dedicated to systems engineering; participated in internal seminars and courses on the discipline as well as devoting time to independent study; and was assigned to take notes at technical meetings. The librarian’s ability to capture the essence of technical discussion was an important factor in engendering management trust that led to other assignments.

As a matter of ongoing practice, the Office’s librarian emphasizes strong communication on several levels. The librarian attends planning and technical meetings and contributes actively. The librarian also meets regularly with the Office’s Director to review priorities and discuss progress on tasks underway. In this way, the Director is kept fully informed on the librarian’s work and its impact on the group. The librarian is proactive about identifying work to be done. When the librarian sees a need, the librarian takes initiative, and creates a recommendation or proposal to address it. The librarian also participates in planning meetings where initiatives are discussed. Various members of the Office’s staff and other contacts in the Corporation are also aware of Office and of the librarian’s role and can therefore advocate for their inclusion as appropriate.

Word of mouth promotion of embedded librarianship is considered extremely effective and has worked well in some cases. However, it is felt that there are still untapped opportunities in which word of mouth has not reached, or not convinced, some in the Corporation who could benefit from the contributions of an embedded librarian. In one example, the development of content on systems engineering for the Corporation’s public website, both the librarian and a communications specialist collaborated with a senior management team and were essential to the outcome. The collaborative experience exposed some of the other technical management contributors to the value of the librarian and communications staff.

Evaluation

Multiple activities are conducted to evaluate the contributions of embedded librarians.

Embedded librarians are expected to maintain strong working relationships and to perform highly valued functions within their information user groups. Information Services Team Leads, who are responsible for the librarians’ performance reviews, solicit feedback from information user group members twice a year. In addition, the Information Services Department manager receives many unsolicited testimonials, and the Information Services management team meets periodically with key senior contacts to elicit their feedback. Information Services Department management also feels that perhaps the most practical measure of success is the demand for the participation of embedded librarians in groups’ projects. Since the groups must pay for this participation, it is a conscious choice that the value is worth the cost.

The perception shared between Information Services Department management, information user group managers, and the embedded librarians themselves is that value comes through demonstrable impact on the user group’s work. The demonstrable impacts can be in the content shared through alerts that communicate important news; highly relevant research that helps solve problems;

Models of Embedded Librarianship: Addendum 2011

and similar content delivery. However, and perhaps more importantly, it can come through the librarian's ability to make connections. For example, the Office's librarian considers the ability to make connections for diverse staff and operating groups within the Corporation with the Office's staff and resources as a key contribution. A further source of value is the librarian's unique perspective and skills as an information / knowledge management specialist, and the ability to identify and solve problems by applying this perspective and these skills.

Management Advocacy

The most direct support for embedded librarians comes from information user group managers in the form of funding. Information user groups must pay for the staff time spent by embedded librarians on participating in the groups' projects, just as they fund the staff time of other team members. Embedded librarians are typically funded by user groups for about 90% of their time. It is not typical, however, for information user group managers to fund continuing education or conference attendance for embedded librarians, although it has happened. It is more typical that they accommodate time away from the office for the librarians' professional development and involvement.

In the case of the Office, as in other engagements, the embedded librarian is treated "as part of the team". Information user group leaders like the Office's Director assure that the librarian is credited for contributions, and gains good visibility to other staff and managers. As noted previously, information user group leaders are typically very readily available to meet with embedded librarians. They are also receptive to communication with the Knowledge Services Team Lead regarding performance and priorities.

Management Advocacy – Library Management

The Information Services Department management fosters embedded librarianship and supports the librarians in a number of ways.

The department funds professional development for embedded librarians, including conference attendance. Embedded librarians are increasingly opting to attend technical and business-related conferences oriented to the work of their groups, rather than conferences of library and information professional groups.

Information Services Department management regularly perform several other key tasks to support the work of embedded librarians:

- Regular communication with information user group management and soliciting feedback from them
- Identifying problems in user group relationships and intervening to address them
- Identifying workload imbalances among staff and ensuring the continuing smooth functioning of the "cluster" system to ensure that overburdened embedded staff get help during periods of peak demand, while underutilized staff are given opportunities to help out, or find other work, when their task levels are at low points.

Models of Embedded Librarianship: Addendum 2011

- Holding regular meetings and other activities for embedded librarians to share their experiences and projects, discuss issues of common concern, and collaborate on projects of common benefit.

There is a shared perception that the embedded librarians can easily become over-tasked and library management must monitor that both the amount of work assigned and the nature of the work assigned are appropriate. The department management supports and develops central staff to back up embedded staff, which is referred to as “Embedded [librarianship] with a team behind it,” or “Enhanced, Enlightened, Embedded librarianship.”

Site Visit 4

Background

Site visit 4 was held at the New York and Washington DC offices of a large international law firm during June 2011. Interviewees included the Chief Library and Records Officer (CLRO), a Knowledge Management Analyst who works in an embedded role, a Senior Research Librarian who works in an embedded role, the Director of Business Development, and a partner in the firm who leads the Benefits and Compensation practice group. The latter two are leaders of the units in which the Knowledge Management Analyst and the Senior Research Librarian are embedded, respectively. This visit was a followup of a site visit conducted during 2009 (See Shumaker and Talley, Models of Embedded Librarianship Final Report, Appendix B, Site Visit 1 at <http://www.sla.org/pdfs/EmbeddedLibrarianshipFinalRptRev.pdf> .)

Embedded Librarian Engagements

Librarians are embedded in a wide array of groups and activities. At the time of the original site visit in 2009, embedded librarian engagements included:

- Knowledge Management Analysts embedded with Practice Groups
- Global Research Analysts
- Mergers & Acquisitions Team analysts
- Company Representation Practice analysts

In the ensuing two years, the level of effort devoted to these relationships has remained roughly the same, and the organizational commitment to them continues to be strong. During the same period, the firm has added three library managers and two librarians overall, primarily to staff new offices of the firm.

A new firmwide initiative, termed "Industry Initiatives" will have a significant impact on the level of embedded library services. The firm has initiated 16 cross-organizational groups focused on relationships with clients in specific vertical industry segments. A librarian has been assigned to (embedded with) each industry segment group. There have not been any new hires to staff this initiative, so this has been done by reallocating staff time to the new tasks. Assignments have been made to take advantage of past relationships, expertise, and co-location where possible. Because the program is new and uptake is uneven, the impacts of this task reallocation have not been felt consistently by all affected staff.

Nature of the Librarians' Contribution

Depending on the engagement, the contributions of the embedded librarians vary significantly. The nature of the work includes:

- Knowledge management: Internal content stewardship and organization, taxonomy management

Models of Embedded Librarianship: Addendum 2011

- News alerting and issue tracking: various methods of news dissemination; building and maintaining databases related to important business and legal issues
- Ad hoc research
- Evaluation and acquisition of information sources and services

Two examples illustrate the range of the librarians' work.

For the Benefits and Compensation practice group of the firm, an embedded librarian provides a range of information management and analysis contributions. This embedded relationship has been in place for approximately 6 to 7 years. The librarian estimates that about 60% of her time is spent on research projects. She also manages a news alerting service to the practice group, and stewards internal content for knowledge sharing. During the past two years, she has been involved in two high-priority projects for the group. In one of them, she was assigned to collaborate with another member of the group (not a librarian) to develop and maintain a customized information system for the group. Ultimately, the critical, time-sensitive nature of the project subsided, and a commercial service was found that could supply the ongoing residual information needed. At this point, the librarian was able to return to other tasks, which had been partially set aside during the project. This librarian participates in meetings and activities of the group regularly, and communicates frequently with the group's leader, who establishes her task priorities. Her tasks affect all members of the group, and her participation is highly visible to all. The librarian notes that she continually learns from the tasks she works on, and thus she builds up knowledge of the domain and context which in turn enables her to be increasingly effective and trusted.

Similarly, the practice group leader describes the embedded librarian's contribution as "invaluable" to the group. A recent, not unusual, assignment to her was to be on the lookout for "anything interesting" in a broad area of interest – signaling trust in her understanding of what would constitute "interesting" and ability to formulate a method to carry out the task.

In the second example, a librarian is embedded with the firm's Business Development Department. This is also a continuing engagement that was discussed in the 2009 site visit, and has been in place for about four years. The librarian performs the same duties as before: primarily research and news alerting. The relationship between the librarian and the head and members of the Business Development staff has become stronger and trust has continued to grow. Requests come from many members of the department. The librarian also contributes insights on information needs. She notes patterns of information needs and makes recommendations on how to address them in a coordinated fashion to serve the entire business unit. For example, after receiving requests from different practice areas for help in tracking relevant conferences, she proposed establishing a regular service to provide that information for a variety of industry segments. Also, after learning that local offices lacked the ability to track key initiatives by their local competitors, she proposed initiating a competitor intelligence service. In addition to the sophisticated level of work performed by the librarian, another factor believed to be important to success is simple responsiveness to the needs of the group. In another example, the librarian was given a general request to determine which peer firms have translated their websites. Because of her experience with the firm and the Business Development Department, the librarian knew

Models of Embedded Librarianship: Addendum 2011

which firms mattered and did not need to be told. The librarian went beyond the task and created an information package with analysis that provided rich details of competitors' initiatives in a very usable form, which the Director found very beneficial.

This ongoing relationship has been affected by the firm's new Industry Initiatives groups. The initiative embeds both Business Development professionals and librarians into vertical industry interest groups, so that Business Development staff now are forming working relationships with different librarians than before. The process of changing the old model and forming new relationships is proceeding unevenly at this writing. A positive by-product of the change, however, is that the librarians are increasing their collaboration, since some of those who previously did not have embedded relationships now have them. The Business Development embedded librarian has been designated to coordinate the embedded librarian engagements across all Industry Initiatives groups.

In both of these examples, the embedded librarians have experienced an increase in demand for their contributions and increased responsibility during the past two years.

In the new Industry segments initiative, described in the previous section, the first task of librarians is to identify key industry-specific information resources and make sure they are accessible. Librarians have been challenged to learn on the job about the industry segment they are assigned to. Librarians are participating in meetings and phone conferences; email lists; and any other communications. This role builds on and leverages the central library's established role as the firm-wide focal point for information resource acquisition, a role that is respected by other firm professionals. It builds on that role by adding the growing expertise of embedded librarians in knowing and understanding the specialized needs and resources of the groups they are working with.

Communication and Promotion

Formal marketing communications are not emphasized. Instead, the strategy for finding the right opportunities to embed librarians relies heavily on the participation of the Chief Library and Records Officer in senior-level meetings. The awareness and relationship building at this level are key factors in ensuring that librarians have the opportunity to contribute – as in the recent Industry Initiatives example. The Officer had advance knowledge that the initiative was under consideration, was able to propose that librarians be involved, and was involved in the meeting when the decision was made and initial plans were put forward.

Word of mouth is another strong influence, especially since information user group leaders like the practice group leader and the Business Development director mentioned above are visible advocates for the embedded librarians. The Business Development embedded librarian meets with new Business Development staff, as well.

Both embedded librarians in the examples above routinely attend meetings and participate in activities of the groups with which they are embedded. For the Knowledge Management Analyst embedded in a practice group, meetings of the group are an important way in which new members understand the role of the embedded librarian. Work products of the Knowledge Management Analyst

Models of Embedded Librarianship: Addendum 2011

are often distributed by the Practice Group leader with full credit to the Analyst, making the role of the Analyst visible to all members of the group.

Evaluation

Members of the library management conduct annual performance reviews of embedded librarians. They may solicit information user group management input on occasion but do not do so systematically. For example, the Business Development director provides considerable anecdotal feedback but is not formally included in the librarian's performance evaluation. The director believes that if there were problems, she would be able to participate. The Chief Library and Records Officer often receives unsolicited feedback, almost always very positive, on the work of embedded librarians. The Officer believes that the organization maintains a culture of openness and communication such that if any information user group manager had a concern, it would be shared with him. Further, the creation of formal mechanisms for soliciting feedback would not be consistent with the firm's culture.

For some areas, the Chief Library and Records Officer directly monitors interactions (via email) and has a direct view on the nature of interactions and the performance of librarians. Similarly, the Business Development librarian monitors email lists for the various Industry Focus groups and can directly assess the status of those engagements.

Another indicator of the value of embedded librarians is the nature of the roles they are asked to play in the information user groups. The practice group Knowledge Management Analyst measures success by the impact on the group's work. The Analyst's contributions are heavily used by the practice group leader and other members. The Analyst's work has on occasion been used in press interviews, client advisories, and other highly visible activities of the firm – and the absence of it would have handicapped the information users in achieving their objectives for these activities.

The embedded Business Development librarian points to the trust placed by the Director and staff of Business Development, and the responsibility given to the librarian. The librarian is consulted on difficult problems, and is able to help shape the work and help define the problem. As noted in the section on the nature of the librarian's contribution, the librarian is able to make recommendations that are accepted, and lead the implementation of them. The Director assesses the librarian's value by saying that the librarian's work "makes everybody do such a better job."

Management Advocacy

The Chief Library and Records Officer notes that, "The culture [of the firm] supports libraries." The firm welcomes those who can contribute to the mission, regardless of professional label, and demands that individuals receive credit for the value they add. Embedded librarians and librarians in general have demonstrated their importance and have the credibility to be invited to participate in any relevant initiative.

The examples of the Practice Group Knowledge Management Analyst and the Business Development Librarian illustrate this culture.

Models of Embedded Librarianship: Addendum 2011

The Practice Group leader supports the Knowledge Management Analyst first by his accessibility. Although they work in different cities and can rarely meet face to face, they have regular phone conferences – sometimes two to three times per week. He also gives her credit for her contributions both within and outside the group, thereby signaling to other group members, including new members, that she is a valued member of the team. He also provides solicited and unsolicited feedback to the library management.

In the second example, the Business Development Director describes the embedded librarian as “integral” to the department. The Director communicates frequently with the librarian, includes her in all department events, and gives her public credit for her contributions. Because they are both located in the same building, meetings are frequent and informal. The Business Development Director champions role of librarian. Whenever a new staff member is hired in the department, the person’s orientation includes meeting with librarian. Generally, the reaction of new staff is that librarian engagement is very desirable. Sometimes the new person comments on how much better it is than operations at employee’s previous employer. The librarian always participates in the Director’s twice-monthly global conference calls with marketing managers. In short, the librarian is, and is treated as, a full partner in the team.

Management Advocacy – Library Management

The role of the Chief Library and Records Officer to participate in senior-level meetings has been discussed in the section on communication and marketing.

Another aspect of management advocacy is the formation of lateral relationships and alliances. The recent initiation of Industry Initiatives groups illustrates the importance of these alliances. The formation of these groups can be seen as a marketing initiative. However, because of the strong working relationships of the leadership, as well as the preexisting embedded librarianship engagement with the Business Development Department, it was possible to form an alliance in which both Business Development and Library staff are engaged in every Industry Initiative group. The view of all parties involved is that this alliance has strengthened everyone involved and will contribute to the initiative’s success.

The alliance works and is maintained in other ways as well. For example, in decisions on the licensing or acquisition of important information services, the librarians typically perform an initial review, but always involve the information user groups, such as Business Development, in the decision.

Beyond maintaining strong upward and lateral relationships, the Chief Library and Records Officer advances a strategic vision for embedded librarianship in the firm. The CLRO believes that library staff must be deployed where the firm needs them; the alternative would be to lose staff. The CLRO promotes the vision that the embedded librarian as part of information user team is a bridge to the central library operations. Not all librarians will be fully embedded but perhaps many will share some responsibility for working across org lines on key projects. To realize this vision, the CLRO focuses on developing bench strength, to ensure that staff have the skills to step in, back each other up, and take on embedded assignments; and institutionalizing embedded roles, developing the ability for an

Models of Embedded Librarianship: Addendum 2011

embedded librarian with existing relationship to hand off work and transfer relationships to new staff. The current Industry Initiatives represent a major opportunity, but successful participation by embedded librarians will require these steps.

Site Visit 5

Background

Site visit 5 was held at the headquarters of an all-distance learning for-profit accredited university during June 2011. Interviewees were two Instruction Librarians. The Director of the Library, who holds the title Assistant Director, Academic Research and Scholarship, was interviewed by telephone. Also interviewed by telephone was the First Course Lead, a faculty member in the Department of Psychology.

Embedded Librarian Engagements:

The university's library operations, which had been fully out-sourced, were brought in-house in 2006-2007, and embedded librarianship was initiated in 2007.

There are three Instruction Librarians. They provide information literacy instruction and counseling through the university's course management system to a variety of courses in various Schools that make up the University. The level of engagement depends on the course. It ranges from the creation of a guide to information resources customized to the needs of the course, to extensive personal interactions with students. One of the longest-running and closest collaborations is the participation of librarians in the "First Course" of the graduate Psychology programs. This description will focus on the nature of that engagement.

In each university program, there is a required "First Course", which is designed to introduce students to the resources of the University and to accustom them to the expectations for study at the level and in the program they are entering. Since the University attracts many adult learners, this mandatory course enables them to adjust to the requirements of an academic degree program. Librarians have been embedded in these "First Courses" because they provide an opportunity to introduce students to library resources, research methods, and information literacy skills early in their academic careers. Librarians have been embedded in First Courses in a variety of programs, but not all engagements have continued to the present.

At present, the most robust embedded relationship is with the Department of Psychology. Librarians have participated continuously in all sections of the First Course for Master's and Doctoral students for approximately four years. Their participation began as follows:

The University holds Colloquium Residencies, which are one-week face to face meetings of Ph.D. students in all schools and programs. Librarians attend these, and provide "one-shot" library instruction sessions. At one of these Colloquia, the Psychology First Course Lead and a librarian fell into a conversation about methods to meet the learners' needs more effectively. At that time, the course was being revised. It had included a discussion unit about using library resources, which the faculty member in charge of the course was not fully satisfied with. The librarian was asked to attend the First Course Scope meeting to consult on search strategies to gather course readings, and brought reference data that showed learners historically had a lot of trouble with the library searches in the course. The faculty members liked the idea of a "Meet the Librarian" unit, and the project evolved from additional course

Models of Embedded Librarianship: Addendum 2011

design meetings. As a result, the librarian was consulted on the assignment and the instructor introduced the librarian to the students (via the course management system) and recommended that they seek the librarian's help. This initial collaboration helped establish a pattern that has led to the librarian's ongoing participation in Psychology First Courses at the Master's and Ph.D. levels. The nature of the librarian's contribution has evolved in the five year time span, and is presented in the next section.

Embedded information literacy instruction in the undergraduate level First Course is being added. The approach to embedding in the undergraduate Psychology First Course will be to create a webinar that will be incorporated into the course. This approach may be extended to other First Courses as well, and is discussed in more detail in the Management Advocacy – Library Management section.

Another embedded relationship also relates to the instructional mission of the university, but does not directly involve course-embedded instruction: librarians are engaged in the curriculum development process of the university. The university follows a formal curriculum development process, termed "Transparency by Design", by which courses are reviewed or revised by a committee composed of an academic administrator, subject matter expert, course and curriculum development expert, and a librarian. This process ensures that course student learning objectives are aligned with university-wide learning objectives, one of which is information literacy. Librarians are always consulted on course revisions, and become most engaged in committees when the course being reviewed includes a research component. In these cases, the librarian can have a strong influence over assignments and instructional methods used to teach information literacy skills in the course.

Nature of the Librarians' Contribution

The embedded librarians' focus is exclusively on contributing to the educational mission of the University through the development of students' information literacy competency. They are not embedded in research or other activities.

The embedded librarian's role in graduate-level Psychology First Courses started as providing research guidance and counseling to students through one-to-one communication in the course management system. Initially, they joined the course for one week to discuss research skills with students through the course management system. This method of counseling proved very time-intensive, and the burden was exacerbated by the fact that enrollment grew dramatically. Multiple sections were added to the course, and the librarian participated in every section. Thus, the model evolved to one in which the librarian posted tips and suggestions proactively, and bundled responses to student questions into general responses. The themes were developed as the librarian gained insight into the typical problems that students encountered. This constituted a sort of customized Frequently Asked Questions approach.

Most recently, the Instruction Librarians have created a research skill "companion" website with tutorial components. There is a self-assessment navigation option, where students can use their self-assessment to tell them which aspect of the website to review first. There is also a final assessment that tests them on their understanding of the concepts, generates answer feedback, and allows them to

Models of Embedded Librarianship: Addendum 2011

email a report of their results to their instructor. The librarians monitor the monthly trends for quiz data to help improve the website over time. The modules in the repository have also been developed out of the insights into student needs gained by experience as embedded librarians, as well as faculty input and the American Library Association's Psychology Information Literacy Standards. The modules are also customized to the subject matter of the course and nature of assignments.

Embedded information literacy modules are coordinated with assignments in the Psychology courses, so that students practice skills immediately after going through the tutorials. The repository has been through the full course development process, and has benefited from collaboration with instructional design and usability specialists.

Under a revised model of embedded instruction currently being piloted, the librarians plan to rely more heavily on standardized guidance messages and tutorials in all their embedded instructional engagements, and reduce their individualized responses to students' requests. The background of this initiative is discussed in more detail in the Management Engagement and Advocacy – Library Management section.

The embedded librarians also serve as a bridge connecting centralized reference services and the university's instructional program. Reference librarians are able to relay concerns about a course assignment to the embedded instruction librarian, who can then recommend changes; also the reference librarians can access the course management system and refer students to the instruction librarian's course guides and postings for the course.

In the librarians' embedded engagement in the curriculum development process, their contributions are to influence the inclusion of appropriate information literacy instruction, assignments, and evaluation, in courses, to ensure that information literacy learning objectives are met.

Communication and Promotion

As described previously in the "Engagements" section, the current embedded instruction in the graduate-level Psychology courses came about as a result of librarians attending a Ph.D. Colloquium .

Because of the success of the Psychology collaboration, the Psychology First Course Lead has become an advocate for the embedded librarianship model. She has spread the word about its success at Best Practices meetings, where First Course Leads from different Schools meet to discuss common problems and solutions. She notes that her recommendations have "created great jealousy" among other First Course Leads.

In the current relationship with the Psychology Department, librarian participation in the Psychology curriculum development process ensures visibility within the department. In addition, one librarian is regularly assigned to this department, so the librarian has become well known to the instructors.

The faculty in turn serve as important agents to communicate the librarian's availability and value to the students. Typically, faculty who have worked with embedded librarians before understand

Models of Embedded Librarianship: Addendum 2011

their role and value. They announce the librarian's availability and encourage students to rely on the librarian. Librarians track when assignments are given and due, and time their communications to students in a course to coincide with the assignment.

In addition to this regular process to maintain the visibility of embedded instruction for the Psychology Department, the library has a process to identify and reach out to other potential users. There is a Reference & Instruction Effectiveness Team that mines library reference records to identify courses and assignments that have generated the greatest volume of requests. The Instruction Librarians reach out to faculty teaching those courses to offer their services. The librarians have found that the faculty respond well to this course-level outreach; much better than they respond to general communications.

The librarians' embedded role in the course development process also supports their communication with subject faculty. The librarian who has been embedded in courses of a particular department participates in course development teams for that department, thus reinforcing the relationship of the librarian with the assigned department.

Evaluation

Information literacy is a meta-outcome. It is a university-wide objective but it is not clear that course objectives always reflect it appropriately. The librarians are working toward more direct involvement with the course authoring management system, which will allow clearer visibility to gauge to what extent the larger Information Literacy Outcome is being integrated into individual courses.

Embedded librarians are able to assess their contributions primarily through feedback and anecdotes volunteered by faculty members, and by comments on student course evaluations. Comments by both faculty and students are almost all enthusiastic. Faculty input on librarian performance could be made part of the performance evaluation process, but has not been to date.

The students' information literacy skills are evaluated in several ways: by their performance on course research assignments, by their performance on capstone assessments of research and information literacy skills, and increasingly by the results of pre- and post-tests on new instructional tutorials. The new website First Course model will enable the librarians to treat the individual discussion posts as learning "artifacts", which can be assessed using authentic assessment rubrics. They will then be able to communicate the aggregate final assessment data to the faculty on a monthly basis, to let them know what questions learners are persistently getting wrong.

The librarians have also traced student behavior and use of library reference services, comparing students in the Psychology program who have the benefit of an embedded librarian in their First Course with students in other majors who do not have the embedded librarian. They have found that the Psychology students request help more frequently during their First Course and less afterward, implying they they develop a greater capability to do their own research, compared to other disciplines.

Models of Embedded Librarianship: Addendum 2011

The library staff have also done a citation analysis, comparing the research papers of students benefiting from course embedded librarians with papers of students not having access to embedded librarians. They found better use of the scholarly literature in papers by the students having the benefit of embedded librarians.

The Psychology First Course Lead has additional tools to assess the value of the librarians' contribution. She notes that students are typically overconfident about their research skills when they enter the academic program. In the past, she has noted a marked improvement in the quality of sources they use in their second writing assignment, which comes after information literacy instruction, compared to the first assignment, which precedes the instruction. In addition, as part of the final unit of the course, students are asked to discuss the three most valuable things they have learned in the course. She estimates that well over 90% list research skills and library use as one of their three choices. She adds that she believes the students both gain greater skills in doing their own research, and greater appreciation of the value of consulting a librarian when they run into difficulties. Finally, the Course Lead believes that, based on initial experience with the use of customized learning modules, they will prove even more effective than past methods in teaching information literacy skills. She notes that when students do not do as well as they expect on the pre-test, the immediate feedback punctures their overconfidence, and they start to take the need to learn these skills seriously. Ultimately, the result is that they apply themselves and achieve greater mastery.

Management Advocacy

The embedded librarianship program benefits from the expressed support of several key administrators. They include the Dean of the School of Social and Behavioral Sciences, which is the parent of the Psychology Department, and the head of the Course Development office. It is expected that this support will be valuable in current efforts to extend the embedded model, which are discussed in the next section.

Management Advocacy – Library Management

The Library Director has taken several steps to provide the ability to scale up embedded librarianship and provide for parity in incorporating embedded information literacy instruction in courses without adding new staff.

The library staff were reorganized to form separate groups for Reference and for Instruction. The Instruction librarians are the ones who perform embedded librarianship engagements. The separation has enabled them to focus on this aspect of library operations.

Several additional initiatives are underway:

- The embedded model will be expanded to First Courses in schools and departments not now included. In order to do this without adding library staff, it will be necessary to modify the nature of embedded instruction so that librarians are not as personally involved and do not have to spend as much of their time per course. They will rely on the modules and assessments within

Models of Embedded Librarianship: Addendum 2011

the newly created Library Research and Information Literacy Skills site designed for First Course use, as well as focused, customized research guides to replace part of their individualized participation.

- There will also be an effort to strengthen the evaluation of the embedded model. It will be important to assess whether embedded librarianship correlates with improved student performance on research and information literacy skills, and whether the new model of embedded participation has an effect on learning outcomes.
- Finally, and related to the two previous initiatives, the university is elevating the role for the librarians in its Course Authoring System, which is used by the course development team. This move elevates the librarians to a higher role in curriculum development, since it allows them to see all course outcomes and competencies, better drive their conversations with faculty and design staff, and allows the designers to send requests to them through the system itself. In sum, it expands their partnership role in building courses. It is also expected to allow the library staff to measure the effectiveness of library materials (guides and resources) in helping learners gain research and information literacy competencies.

Site Visit 6

Background

Site visit 6 was held at the headquarters of a large privately held corporation during June 2011. Interviewees included the Director, U.S. Scientific Knowledge Services; the Director, Business Knowledge Services; and the Assistant Vice President, Knowledge Management. In addition, a telephone interview was conducted with the Technology Information Services Coordinator at a corporate research center located in Europe.

Embedded Librarian Engagements

Current library operations have roots in a scientific library that previously served the Research and Development activities of the firm. Within the past 20-25 years, the corporation sharpened its competitive focus and the need for business information and competitive intelligence grew. The former scientific library was broadened to meet business as well as scientific information needs. Currently the Assistant Vice President, Knowledge Management has responsibility for the InfoCenter, as it is now known; corporate archives; and web communications. The Assistant Vice President reports to a corporate vice president who is one of thirty top leaders directing the company's global operations.

Two Directors in the InfoCenter function as relationship managers for scientific and business information users, respectively. They are responsible for assuring the quality of information delivery in their respective areas, and also for securing funding from information user groups for continued staffing of information delivery work. The relationship manager for scientific information and one other InfoCenter staff member are physically embedded: they are co-located with research and development staff at a separate building on the corporation's headquarters campus. They also work closely with librarians who are embedded in other corporate research and development units located elsewhere around the world.

An example is the Technology Information Services Coordinator in the European research center. This position is not part of the InfoCenter organization, reporting instead to the management of the Research Center. In this sense, the Coordinator is both physically and administratively embedded in the Research Center. Despite their differing reporting and administrative relationships, the InfoCenter's librarians and the Coordinator collaborate extensively.

The business information relationship manager and other business information specialists are located in the InfoCenter in the corporate headquarters building. They are embedded by virtue of their close working relationships and deep engagement with marketing and related business projects, and because a substantial proportion of their funding is provided by the information user groups in business operations. Five InfoCenter librarians constitute the Business Knowledge Services team. Each of them has specific, ongoing relationships with different sectors of marketing activity.

In addition, the Directors often become embedded in project teams. For example, the Director for Scientific Knowledge Services is a member of a multifunctional team that develops and monitors knowledge management initiatives for the research and development units of the corporation.

Models of Embedded Librarianship: Addendum 2011

KM services for scientific area focus on sharing of research – technical reports, research reports.

Nature of the Librarians' Contribution

Embedded librarians in both the scientific and business areas provide a range of in-depth research and analysis; monitoring of key competitors and relevant industry news; providing news updates; and training. Training activities include bringing in vendor representatives to increase awareness and offer training on the vendor's products. In both the scientific research and development and business and marketing areas, the librarians see the essence of their role as streamlining corporate processes and assuring that all information user groups who need information can consistently obtain the best information for their purposes.

On the scientific research and development side, there is one technical information specialist who focuses on external research & analysis for scientific area. This specialist has an advanced degree in a relevant field. As mentioned in the preceding section, there are also embedded librarians at research centers who perform similar functions at their labs. However, the company also maintains research and development facilities that do not have embedded librarians. The InfoCenter librarians serve these groups, manage licenses to give the laboratory scientists access to relevant databases, and also travel to meet with staff and provide training on key information resources.

The Scientific Knowledge Services team also uses a blog to publish news of interest to the research teams. Items are typically posted daily, with a weekly push notification service. Their training engagements also include teaching lab scientists how to set up their own technical alerting services in various scientific and technical databases. The team is currently developing the capability to create digital video training modules, in order to improve information user groups' access to the training and reduce the burden and inefficiency of traveling for in-person training delivery.

Business Knowledge Services staff have close working relationships with specific marketing groups and become engaged in projects of those groups. Project teams, or "Execution teams" as they are sometimes called, create issues maps of the key issues facing the team. The embedded librarians use these maps to identify information needs, which they then address by providing news and in-depth research and information analysis to the team. A key feature of the embedded librarianship operations, however, is that embedded librarians also have detailed domain expertise and expertise in the use and analysis of different information and data resources. It is common for a staff member working on a project to get help from another staff member who has advanced knowledge of a particular database or analytical tool.

The Business Knowledge Services team also produces multi-source curated newsfeeds for targeted interests. Some high priority news items are distributed daily; other newsfeeds are pushed out weekly. This work has become more complex recently. The librarians are finding that key business news sources have withdrawn from information aggregators and publish digitally only on their own websites, so that there is a need for tools to manage the process of harvesting the news from multiple sites.

Models of Embedded Librarianship: Addendum 2011

In fulfillment of the mission of Knowledge Services to provide the best information consistently to all in the company who need it, the Business Knowledge Services team some time ago identified a problem that different business units were trying to create profiles of the same customers and competitors, with inconsistent and sometimes poor results. The InfoCenter coordinated the creation of a standard corporate profile template, and maintains profiles of key customers and competitors, so that all marketing and sales units can readily access them as needed, and augment them as necessary for specific business needs. They are heavily used by a wide array of business units.

Embedded librarians are engaged in other corporate projects as well. Currently, the company is increasing the use of multi-functional teams to solve specific problems or carry out major initiatives. The use of these teams increases the need to manage and coordinate business and technical categories to ensure effective coordination. The Director of Scientific Knowledge Services is involved developing a system of categories, and is using external benchmarks to help formulate and inform categorization to support the effective implementation of corporate strategy.

Communication and Promotion

The Directors of scientific and business knowledge services have primary responsibility for communication and promotion. Traditional broadcast communications are not emphasized, and neither director finds the corporation's orientation program for new hires to be an effective way to communicate. It is rushed, and there is little time to communicate the value of the InfoCenter or describe its services.

Instead, both directors focus on regular, usually semi-annual, meetings with key business unit heads. These meetings include discussion of business unit plans and related information needs; a review of information services and performance; and establishing the funding allocation from the business unit to the infocenter. Both relationship managers also regularly participate in staff and management meetings of key business units, where unit plans and progress are discussed.

Other methods of communication and outreach to individual employees vary between the scientific and business information areas. In the scientific area, the emphasis is on monitoring new hires and contacting the individuals. In the business area, there is more reliance on managers to refer new staff to the InfoCenter. In some cases, units have sent new employees as a group to meet with the Director and InfoCenter staff.

Both directors also rely on corporate strategy documents to help align embedded librarians with company and business unit priorities. A key document is the company's Global Technology Strategy, and there is a companion document, the Business Technology Alignment Plan, which maps the relationship between research and development and business and marketing areas.

The Director of Business Knowledge Services notes that relationships with business units vary; some are closer and more engaged than others. In the best cases, InfoCenter staff are brought into product development initiatives early. When this happens, they can help drive the process and pull in other specialists as needed. They can also evolve the information services for the initiative to address

Models of Embedded Librarianship: Addendum 2011

different needs at different stages of the project. Initiatives can also involve both technology and business interests. The Director notes that embedded librarians are “constantly pulled into new projects based on relationships.”

Both Directors find that their approach to relationship management has worked well. Leaders of information user groups currently receiving, and paying for, embedded services consider them very valuable. One, whose unit increased its use of information services dramatically, was asked to double his funding allocation, and responded that the InfoCenter embedded librarians were the best bargain in the company. On the other hand, there is some concern that embedding in some business areas, and focus on existing relationships, has inhibited the InfoCenter’s ability to establish relationships with new business areas.

Evaluation

The primary channel for evaluation of embedded librarians’ work is the series of regular meetings between Knowledge Services Directors and information user group leaders described in the previous section. These meetings include feedback on the embedded librarians and InfoCenter services in general. In addition, Corporate Affairs, which is the parent organization of the InfoCenter, conducts a broad service quality survey every eighteen months. The survey includes InfoCenter services, but at a very broad level that is of limited usefulness.

For individual performance reviews, comments volunteered by information users may be incorporated in reviews. The corporation also uses a 360-degree performance evaluation process, and information users are invited to provide input on the embedded librarians.

Ultimately, the InfoCenter management sees the willingness of business customers to pay by allocating funds to the InfoCenter as the critical measure of value. As noted in the previous section, one unit engaged in intense marketing initiatives has doubled its allocation of funds to InfoCenter services, because the perception of value is very strong.

Management Advocacy

The primary way that information user group leaders demonstrate support and advocacy for the embedded librarians is by funding them. Forty percent of the InfoCenter staff time is funded by information user groups. Funding allocations are fixed annual commitments based on past year experience, with the added consideration of any known plans for enlargement or shrinkage of the group.

Information user group managers also support the embedded library services by referring staff to them, including the relationship managers and other librarians in unit and project meetings as appropriate, and meeting regularly with the relationship managers to share feedback and establish commitments.

The InfoCenter managers feel that their value is less well understood at senior levels of the company than among middle management. The Directors and the embedded librarians work closely

Models of Embedded Librarianship: Addendum 2011

with mid-level managers but do not have great visibility at the senior levels. To some extent, the mid-level managers carry the message about the value of librarians' contributions to upper management. Changing the perception of senior management is not a critical issue for the InfoCenter at this time. The company is relatively decentralized and corporate mandates are eschewed. Therefore, the mid-level managers have a great deal of autonomy and control over their own units.

Management Advocacy – Library Management

As noted in the section on Communication and Promotion, the Directors are the primary advocates for embedded librarianship. In their regular meetings with information user group leaders, they advocate for up front and early engagement of librarians in projects and initiatives. The array of contacts they maintain is quite diverse. The job titles of key contacts of the Director for Business Knowledge Services include Marketing Leads, Product Line leads, Project Leaders, and project and unit Controllers. For the Director of Scientific Knowledge Services, the key contacts include Technology Directors and Controllers. The appearance of Controllers on both lists is significant. At the company, unit controllers typically have a strong influence on budget allocation decisions, so that it is vital for them to understand the value of embedded librarians and support the allocation of funds to the InfoCenter.

Both Directors are experiencing a growing need to coordinate with cross functional teams: teams made up of members from various units, brought together to solve a particular problem or execute an initiative, as noted in the earlier section on the Nature of the Librarians' Contribution. The use of these teams also increases the importance of collaboration within the InfoCenter.

The Assistant Vice President advocates for the InfoCenter within the management group of Corporate Affairs, the parent organization. The Assistant Vice President finds that examples and anecdotes of the InfoCenter's value are most effective. A major multi-year research and development and marketing initiative is an example of an engagement in which the embedded librarians had an important impact.