



## Hey, You Got Business in My Engineering! : Collaborating to Support Entrepreneurship Research

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# **Hey, You Got Business in My Engineering!: Collaborating to Support Entrepreneurship Research**

## **Abstract**

This paper presents a case study of a mutually beneficial collaboration between an engineering librarian and a business librarian and provides suggestions for engineering librarians looking to form cross-disciplinary partnerships.

While engineering and business students have different information needs, topics such as patents, manufacturing standards, and industry research are relevant to both areas. Collaboration between the librarians serving these programs is important to best support users. Yet at large universities, these librarians might be working on different teams and even in different buildings. Such was the case at one university, where the engineering librarian and the business librarian, and their respective collections, were for many years based in libraries on opposite sides of campus.

In 2016, a newly hired business librarian was placed in an office in the campus STEM library and the engineering librarian was assigned as her peer mentor. A shared workspace and regular one-on-one meetings between the two librarians facilitated greater collaboration in reference, instruction, and collection development. Both librarians learned more about specialized resources with which they had been less familiar. For instance, the engineering librarian gained new expertise in market research and shared knowledge about patent searching with the business librarian. Their closer working relationship led to a partnership in support of entrepreneurship on campus. They developed and presented a faculty workshop on entrepreneurship research and are currently collaborating on a series of instructional videos on the subject.

## **Literature Review**

A review of the literature found several acknowledgements that effective support for campus entrepreneurship often requires collaboration between business librarians and engineering or other science librarians. Business librarians typically bear primary responsibility for providing library support for entrepreneurship; a survey by Toane and Figueiredo found that a large majority (82.95%) of academic librarians who support entrepreneurship also support business and management programs [1, p. 44]. However, “This work is collaborative and interdisciplinary...Common partnerships included engineering, GIS, data and statistics, health sciences, and other business librarians” [1, p. 45]. While business librarians possess “core subject knowledge and expertise to address questions of market-fit, feasibility, and risk”, they may lack an engineering librarian’s knowledge of “design or patentability” [1, p. 58].

In a review of several case studies of work by librarians in support of entrepreneurship, Pothier writes that “Overall, academic business librarians work to support entrepreneurship initiatives on their campuses...Creating partnerships with other librarians, particularly engineering librarians, is one model to disperse the work and create a more interdisciplinary approach to help students and faculty” [2, p. 60]. She cites an entrepreneurship workshop organized by engineering librarians at Drexel University and the University of Pennsylvania (detailed in Christe, Bhatt, McGee, and Wolfish [3]) as an example of how entrepreneurship support is not limited to business librarians.

Howard, Zwicky, and Phillips [4] describe extensive collaboration among specialists in business, engineering, and patents at Purdue University Libraries. The business and engineering librarians provide team consultations to students in engineering design courses and co-teach library instruction sessions. Librarians also provide instruction and consultations for participants in student innovation competitions and several outreach programs that support entrepreneurship in the community. While these collaborative projects have been successful, Howard, Zwicky, and Phillips [4] call for better coordination of Libraries support for entrepreneurship activities.

Feeney and Martin [5], a business librarian and a science librarian at the University of Arizona, collaborated to develop an online research guide and provide library instruction for students in a Materials Engineering Design course. They covered topics such as patent searching, locating and pricing materials, industry codes, and market research. Both librarians found this experience to be of benefit to them in learning how to better support research in their own subject areas:

It has helped the business librarian in her instruction to business students, particularly to students in the Entrepreneurship Program. These students are similar to the students in the materials design course in that they research innovative product ideas and require similar business information...From the science librarian's perspective, he is able to better understand the business side of research, which many future scientists and engineers will encounter in industry [5, Conclusion].

## **Background**

The engineering program at James Madison University (JMU) was established in 2008. That same year saw the opening of a campus STEM library, Rose Library, and the creation of an Applied Sciences Librarian position to provide reference, instruction, and collection management for engineering and other applied sciences programs on campus. The Applied Sciences Librarian hired in 2008 has served in this role ever since. As of fall 2019, nearly 1,900 students at JMU are enrolled in the College of Integrated Science and Engineering [6].

JMU is also home to a nationally recognized business program [7]. The College of Business is the second-largest college at JMU, with more than 5,000 students enrolled in fall 2019 [6]. The Business Librarian and business collections were for many years based in Carrier Library,

located across campus from Rose Library. The Applied Sciences Librarian and Business Librarian were separated structurally as well as geographically. They reported to the respective directors of the two libraries. They also were members of different subject-based collection management teams, the Science and Technology team and the Social Sciences team. As a result, the Applied Sciences Librarian had limited interaction with the Business Librarian.

The Applied Sciences Librarian also had limited familiarity with business resources. It was not immediately obvious that this was a significant blind spot when it came to supporting research in her subject areas. During her first few years at JMU, the most pressing needs of the new engineering program were collection development and library instruction for lower-level courses [8]. The first request she received for instruction relating to entrepreneurship came from the longer-established geographic science program. The course was about entrepreneurship in geographic information systems (GIS), and the Applied Sciences Librarian quickly realized that she did not know how to effectively search for the company and industry information these students would need. She contacted the librarian who was then serving as liaison to the College of Business for help preparing an instruction session and handout. Their differing locations and schedules meant that the Business Librarian had to provide advice via email.

This instruction session was just the beginning of the Applied Sciences Librarian's work supporting entrepreneurship research at JMU. As the engineering program matured, JMU engineering faculty were working to incorporate more entrepreneurial thinking into the curriculum. In 2015, JMU was selected to participate in the Pathways to Innovation program [9], "designed to help institutions transform the experience of their undergraduate engineering students and fully incorporate innovation and entrepreneurship into a range of courses as well as strengthen co- and extra-curricular offerings" [10]. JMU was invited to join the Kern Entrepreneurial Engineering Network (KEEN) in 2016 [11] and was recognized with a Curricular Innovation Award at the VentureWell OPEN conference in 2017 [12]. For the Applied Sciences Librarian, the most obvious effect of these changes was an increase in the number and complexity of the reference questions she received from engineering students working on their two-year capstone projects. A growing competitive intelligence track within the JMU intelligence analysis program also required her to handle challenging questions such as how to find data on privately held companies.

Unfortunately, the Applied Sciences Librarian's increasing awareness of the connections between business and the applied sciences coincided with a period of turnover in the Business Librarian position at JMU. While circumstances prevented significant collaboration during this time, organizational changes at JMU Libraries were helping to break down barriers between liaison librarians. The location-based reporting structure was abolished, and a new Research and Education Services unit was created to include all liaison librarians on campus. Several librarians changed offices during this reorganization, leaving a vacancy in Rose Library. When the current Business Librarian was hired in 2016, she was assigned to this office.

## **An Alliance is Formed**

The director of Research and Education Services asked the Applied Sciences Librarian to serve as a peer mentor for the current Business Librarian. This was partially due to the Applied Science Librarian's expressed desire to work more closely with the business liaison. Another reason this was considered a good pairing was that the Applied Sciences Librarian was by this time the longest serving liaison librarian at JMU. The incoming librarian was new to the institution but not new to the profession, so the primary responsibility of her peer mentor would be helping her acclimate to the work environment at JMU. Simple convenience was also a factor. The new Business Librarian's office was across the hall from the Applied Sciences Librarian's office, making regular check-ins much easier to schedule than if they had required a trip across campus.

The Applied Sciences Librarian and Business Librarian held peer mentor meetings on a monthly basis during the Business Librarian's first year at JMU. Early meetings focused on campus culture, library procedures, and the promotion and tenure process. As the Business Librarian settled into her role, they began to spend more time talking about specific issues in her work as a liaison. These topics also arose during casual interactions in the office suite.

Through these conversations, both librarians became more aware of the overlap between their subject areas. For instance, students working on business plan proposals often need to search for patents, engineering standards, and information on materials science and manufacturing processes. The Business Librarian had sometimes struggled to help these students, just as the Applied Sciences Librarian had sometimes struggled with questions about company, industry, and market research. Both librarians supported research related to cybersecurity, with the Department of Computer Science [13] and the College of Business [14] offering separate graduate degrees in Information Security. Their close working relationship allowed them to share tips on search strategies and useful resources as well as handouts and other instructional materials.

Both librarians found these conversations so helpful that they agreed to continue meeting regularly even after the Business Librarian's onboarding process was complete. The university had made encouraging "the translation of innovations to social and commercial entrepreneurship activities that add value to the region" a strategic priority [15], and they agreed that they were the two subject librarians best positioned to further this goal. They began discussing how they might combine forces to provide better support for campus entrepreneurs.

## **Outcomes**

### *Entrepreneurship Learning Modules and Workshop*

In 2018, the Applied Sciences Librarian and Business Librarian began working with the JMU Technology Innovation and Economic Development (TIED) to create a series of video learning modules on entrepreneurship. The TIED office, which serves both the university community and the local area, helps protect and commercialize intellectual property developed on campus and aids in launching startups in the region [16]. This project was put on hold when the Business Librarian accepted a study abroad placement with the College of Business Semester in Antwerp Program in 2019. Work resumed with the Business Librarian's return to campus, and production of videos on market research, patent searching, and intellectual property for entrepreneurs is underway.

The preparatory work for these learning modules led to the development of a workshop for faculty titled "How to Research Your Business Idea." This workshop, which was presented in November 2018, covered tools and strategies for researching ideas and writing successful business plans. The session was attended by seven faculty members from across the university and received a positive response from the attendees. In the future, JMU Libraries plans to repeat this workshop in conjunction with entrepreneurship initiatives on campus, such as the Gilliam Center for Entrepreneurship's Summer Accelerator or the X-Labs program that works with client partners on real problems.

### *Co-Teaching*

The large number of students in the College of Business means the sole Business Librarian has a busy instruction and consultation schedule. JMU Libraries is working to rebalance liaison librarian distribution across the colleges. In the meantime, the Applied Sciences Librarian has been able call upon her improved knowledge of business research and resources to help support library instruction for business students.

The Business Librarian and the Applied Sciences Librarian co-taught library instruction sessions for two sections of a lower-level business course in the fall of 2018. The Applied Sciences Librarian then served as a substitute for library instruction sessions while the Business Librarian was abroad in the spring of 2019. She has since provided library instruction for other classes, particularly those in the College of Business's Computer Information Systems program, when the Business Librarian was unavailable to teach.

### *Collection Management*

For several years, the Applied Sciences Librarian and the Business Librarian managed monograph collections that were split across two library locations. Most STEM books were

shelved in Rose Library. However, many titles relevant to engineering and telecommunications fell under Library of Congress subclasses HD: Industries, Land use, Labor and HE: Transportation and communication, which were shelved in the business section (subclasses HA-HJ) in Carrier Library. Some business-related titles fell within call number areas shelved in Rose Library, particularly subclasses TS: Manufactures and TX: Home economics, which includes the hospitality industry. The JMU College of Business offers majors in Computer Information Systems and Quantitative Finance, so both the Applied Sciences Librarian and the Business Librarian have a stake in the titles about programming languages and computer applications shelved in subclass QA in Rose Library.

In addition to managing collections in two locations, the current Business Librarian had the inconvenience of an office located in a different library than the one where most of the business collection was shelved. Carrier Library is somewhat closer to the academic building that houses the College of Business, but campus bus routes make the trip to Rose Library just as easy for students, so neither location has an obvious advantage in terms of user access. With space being a perpetual issue in the older Carrier Library, the Business Librarian was able to advocate successfully for the business collection to be moved to Rose Library. Subclasses HA-HJ were relocated in the summer of 2019. This move largely eliminated the split collections problem for both business and engineering.

A better understanding of overlapping database needs for STEM and business programs has emerged through the two librarians' improved awareness of one another's subject areas. The Applied Sciences Librarian and Business Librarian recently submitted a joint request to license the IEEE patent search tool InnovationQ Plus to support intellectual property and competitive intelligence research. They also worked together to evaluate Burning Glass Technologies and CB Insights, resources that cover topics of interest to both colleges such as labor trends and startup funding. Ultimately, the Business Librarian found that the library resources needed to support business research were more likely to be of interest to JMU STEM programs than to other social sciences programs. She suggested reorganizing the subject-based collection management teams to place business within the Science and Technology team. This change occurred in the summer of 2019, allowing the librarians on this team to advocate for resources more effectively.

### *Research*

This paper is the first time the collaboration between the authors has extended to scholarship, but it will not be the last. While revising this paper, the authors were inspired to survey engineering and business liaison librarians at other institutions about their own experiences. The full results of this survey will appear in a future publication, but preliminary findings indicate that librarians who work in these subject areas are often separated from one another. At institutions with multiple libraries, two-thirds of respondents reported that engineering and business liaison

librarians worked in different buildings. At institutions with subject-based teams, 87% of respondents reported that engineering and business librarians worked on different teams.

## Conclusion

At JMU, the close collaboration between the Applied Sciences Librarian and Business Librarian was facilitated by changes in office locations and reporting lines. Based on our experience, the authors encourage reconsideration of existing geographic and organizational separation of subject areas. These divisions present practical barriers to interaction and collaboration. According to Allen and Henn, in the workplace “a mere 50 meters’ separation between people essentially results in the end of regular communication” [17, p. 63], although “[c]ommon departmental membership increases the likelihood of communication independent of separation distance” [17, p. 56]. Traditional academic groupings that separate business from technology might no longer reflect the needs of library users. Co-locating engineering and business collections and librarians might be a better way to support research in both disciplines.

We recognize that such changes are not easily made and would not fit the needs of every institution. Proximity alone is also not enough to ensure collaboration. On the individual level, subject specialist librarians must seek opportunities to connect with colleagues. The collaboration between the authors began with a peer mentoring relationship. Co-teaching instruction sessions and peer observation of teaching or reference consultations are other ways for librarians to learn more about how their subject areas intersect. These professional development opportunities should not be limited to new librarians. Even experienced liaison librarians can benefit from greater familiarity with research and resources in other subject areas. Peer-led workshops and brown-bag sessions are other options for learning about subject resources.

Once the authors took the initiative in collaborating on support for entrepreneurship, we began to see even more possibilities for strengthening our alliance and its impact at JMU. As more universities invest in multi-disciplinary initiatives or co-curricular projects focused on entrepreneurship, GIS, or data science, it will become increasingly important for librarians specializing in these areas to provide integrative support.

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