A First Year Engineering Information Literacy Workshop to Increase Student Awareness of Research Databases

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Introduction

In the late summer of 2018, the Northeastern University Library and the College of Engineering started work on a collaboration that would benefit and support first year engineering students. The goal of the First Year Engineering (FYE) Library Workshops is to introduce first-year engineering majors at the university to the library's resources and databases, thus establishing a foundation in university-level engineering research.

The Northeastern University College of Engineering, following a successful pilot in 2014, decided to adopt a "Cornerstone to Capstone" curriculum design for all incoming first-year engineering students. The Cornerstone course incorporates hands-on, project-based design work with computer programming. Previously taught in two separate FYE courses, the new Cornerstone course model blends programming and design in a way that demonstrates the intertwined nature of the two skills. The project-based Cornerstone includes occasional incongruent learning of course content. By highlighting that problem-solving in engineering brings together groups of competencies in a networked rather than a linear fashion, the program improves instruction by demonstrating that this incongruence is acceptable. Specifically, the emphasis is on the Cornerstone as an example of the ways in which engineering can develop practical problem-solving applications.

At Northeastern University, the first year is common for all engineering majors. The Cornerstone course was carefully designed to help first-year students achieve success in the program regardless of the specific engineering major they select in their second year. Therefore, the course includes themes centered on several design-and-build projects with the following program objectives:

1. Provide students with the opportunity to experience engineering as an evolving, creative, and interdisciplinary career that impacts global society and daily life.

2. Provide students with the opportunity to develop process-driven problem-solving skills that recognize multiple alternatives and apply critical thinking to identify an effective solution.

3. Provide students with the opportunity to integrate math & science in an engineering context.

4. Create motivated and passionate engineering students by challenging them with authentic engineering problems across multiple disciplines.

5. Instill in students the professional, personal and academic behaviors and common competencies needed to move to the next stage of their development.

Following the design process taught in the course, the program has continually been reevaluated and redesigned over the past several years. These redesigns have included iterative steps: identifying new problems, doing research, developing creative improvements, working as a team to pilot the changes, evaluating the program, and repeating the process. The inclusion of the information literacy workshop, which provides hands-on learning in the use of databases for research, is another step in Cornerstone's evolution. Prior to the workshops, instructors noted limited use of citations and academic references in design reports and research presentations. The workshop teaches students how to conduct university-appropriate research, taking them beyond basic search engines. This paper describes the development of the library workshop and assesses its successful, seamless integration into the Cornerstone course.

Literature Review

Given their heavy workload and intense schedules, first-year STEM students often struggle with the transition to college [1]–[3]. In order to mitigate student stress and improve retention rates, many universities have designed FYE programs to introduce engineering students to university-level academic standards with scaffolded assignments and focused support from campus partners. At the 1999 ASEE/IEEE Frontiers in Education Conference, Dr. Eric Soulsby from the University of Connecticut presented on a FYE program that included classes on note-taking, reading textbooks, studying for exams and accessing counseling and career services [4]. In that program, a presentation on the library catalog and Internet search tools was one of several guest lectures provided by campus offices [4].

More recent papers by engineering educators have focused on the importance of actively collaborating with librarians to foster engagement by FYE students with library resources and services [5]–[7]. This may take the form of developing a curriculum that addresses Accreditation Board for Engineering and Technology, Inc (ABET) criteria [6], [8]; the ACRL Framework for Information Literacy for Higher Education [8] (or its predecessor, the Information Literacy Competency Standards for Higher Education [9]); technical writing skills [7]; active learning techniques [10]; or some combination of these.

Assessment has shown that library interventions in college courses have a positive impact on students' relationship with the library as well as their research skills [11]. In addition, engagement with the library can increase student GPAs and retention across the university [12].

First-year students in particular have demonstrated improved skills in information literacy when library sessions are incorporated into their curriculum [13]. Library instruction can help to create a "supportive learning environment" in which first-year students are both challenged and supported through the transition to university-level work, leading to more positive outcomes as they progress through their degree program [14].

Northeastern University Library and the First Year Engineering Program

In the fall of 2018, the new First Year Experience and Undergraduate Engagement Librarian (UEL) reached out to several colleges at the university with programs specifically designed for first year majors. Unlike traditional first-year seminars, these programs run for a full academic year and are focused on grounding first-year students in a discipline.

One of the first programs that responded was the FYE Program in the College of Engineering. The FYE Program has been in existence for over 20 years, but prior to the UEL's introduction, students had little focused interaction with the library.

The UEL met with the FYE director at the time, and the two developed the idea for an FYE-focused library workshop. The UEL attended one of the FYE department's meetings to discuss what the library's involvement would be and what the workshops would look like in terms of content and delivery. In addition, a new STEM librarian supporting Bioengineering was tasked to help develop these workshops.

FYE Library Workshops: Fall 2018

Lesson Plan
To meet the needs of the FYE students, the UEL and STEM librarian met with the Engineering Librarian to discuss relevant engineering and science resources. With input from the Engineering Librarian, the UEL and STEM librarian developed a lesson plan to introduce students to a variety of resources in a fast-paced manner. Rather than provide in-depth introductions to one or two resources, the workshop would provide a high-level overview of a variety of resources. As first-year students were likely unfamiliar with the library, the workshop started with an introduction to the library as a physical space and the library website as a virtual space. Students learned how to use the library catalog to find books and e-books. They were also introduced to the library's research subject guides, which provide relevant resources for individual subject areas. The bulk of the workshop featured demonstrations of and introductions to two engineering-specific resources, Engineering Village and Knovel, and two general science resources, Web of Science and ScienceDirect. The session ended with a series of assessment questions and a brief introduction to citation management software. See Table 1 for more detail.

Table 1: Lesson Plan and Assessment Questions for Workshops

Lesson Plan	Topics Covered	Changes for 2019-2020 academic year	Assessment question(s), 2019-2020
Introduction to the Library	How to get help from a librarian How to book a study room	N/A	N/A
How to Use the Library Catalog	How to find books and their locations using Scholar OneSearch	N/A	Question 1*
Introduction to Engineering Village and Knovel	Introduce two Engineering focused resources and show basic search and filtering features including filters for date, document type, country, and author.	N/A	Questions 2-5*
Introduction to Web of Science and ScienceDirect	Introduce two general science databases and show basic search and filtering features. In Web of Science, this included covering the difference between sorting results by Times Cited and the article metric 'Highly Cited in Field'.	Fall 2019: ScienceDirect was eliminated Spring 2020: Streamlined Web of Science coverage of Times Cited vs. Highly Cited in Field	Question 6*
Demonstration of Citation Management Software	Explain what citation management software is and show how it works with Microsoft Word	N/A	N/A

* See Table 4 for full questions

Team Teaching
Based on the past experiences of the STEM Librarian, the UEL and STEM librarians decided to co-teach the workshop to monitor students' attention and the reception of the class. Roles were alternated during the presentation in the hopes that a change of voice, presentation style, and even the location of the presenter in the classroom would help keep students engaged throughout. While this was not formally assessed, librarians found that students were engaged, the classroom itself felt collaborative, and they enjoyed bringing a sense of conversation into their teaching.

Scheduling and Registration
The workshop was scheduled around research assignment due dates set by each instructor. The same workshop was offered total of thirteen times during the fall in a large lecture hall-style classroom with a capacity of 72. Students were asked to bring laptops for the hands-on portion of the class. Six extra sessions were scheduled for 'overflow' in case students requested additional workshops, and all six overflow dates were used in Fall 2018.

Students registered for workshops using LibCal, which captured their name, email, and instructor information. The librarians used these registrations to confirm class attendance and shared attendance information with the instructors.

Attendance
In Fall 2018, three out of eleven total instructors for the Cornerstone class asked students in their course sections to attend the workshops. A total of 157 students attended, with 52%, 71%, and 100% of students participating from each instructor's class (see Table 3).

Next steps: Spring and Fall 2019, Spring 2020
The FYE directors asked that the workshops be repeated for Spring 2019. For an overview of changes in the program, see Table 2.

In Spring 2019, the librarians chose not to modify the lesson plan in order to maintain consistency for the full class of 2023. In the interest of ensuring inclusivity and accessibility of the workshops, the librarians edited the registration form to encourage requests for accommodations. The workshop location changed to a smaller, brighter computer classroom in the library with a max seating capacity of 23, rather than the previous large lecture hall classroom, in an effort to create a more personal and inviting experience. The Engineering Librarian joined the team to assist with team teaching. Thirteen classes were offered throughout February and March. Although projected attendance was lower for Spring 2019 than Fall 2018, the actual attendance was higher, as four of the eleven instructors required their students to attend. Participating instructors requested that students return to class with some paper proof that they had attended the workshop, so the librarians developed a short worksheet for students to return to their instructors. For a detailed look at attendance, see Table 3.

In preparation for the Fall 2019 semester, the team made adjustments for the 2019-2020 academic year. The FYE program directors strongly encouraged instructors to require the workshops for their students, which dramatically increased the number of students expected to attend. The librarians expanded the number of workshops offered in order to accommodate all 801 incoming students. This included onboarding the Computer Science Librarian, bringing the total number of teaching librarians in the program up to four, and one additional librarian who offered to provide emergency backup. To help with onboarding, the UEL and STEM librarian

provided a demo workshop in July and a follow-up practice workshop for the new team members. Shortly before the start of the fall semester, the Engineering Librarian retired. Because of the onboarding of the Computer Science Librarian, the anticipated workload was not significantly affected by the Engineering Librarian's retirement and librarians were able to provide the workshops as planned.

For Fall 2019, the workshop was held in the same library classroom as Spring 2019, and up to three workshops were scheduled for each day over a two-week period. The registration system did not change. To provide further incentive for students to attend, FYE directors suggested including a graded assignment in the workshops. Librarians developed a trivia-style assignment to capture student answers and generate grades. Questions for the assessment were based on class content, and the librarians used PollEverywhere's competition mode to create rankings and show winners, who received a small prize. To create additional time for the in-class assessment, the librarians revisited and refined the lesson plan, including removing ScienceDirect from the workshops.

The team scheduled twenty-eight workshops (with an additional six potential overflow workshops) for Fall 2019. Two instructors, teaching six sections between them, requested in-class sessions in lieu of having students attend the workshops outside of class. Librarians adapted the workshop and assessment to fit the allotted in class time by removing a few of the assessment questions and shortening other parts of the lesson plan. An additional six classes were added at different times based on instructor requests, and several of the originally scheduled workshops were consequently cancelled. In total, the librarians taught thirty-two workshops and six in-class sessions from September 9 to October 11, 2019.

The librarians cross-checked attendance with an in-person check-in (based on the registration forms) and an authenticated log-in for PollEverywhere. Eight of eleven total instructors required students to attend the workshops (see Table 3 for additional details). Two students whose instructors did not require attendance chose to attend voluntarily. In total, 501 students (62.5%) out of a possible 801 students in the FYE program participated in either an in-class session or library workshop during the Fall 2019 semester.

In Spring 2020, the workshops ran through January with two instructors and 86 students participating. Librarians offered ten workshops over the course of three weeks without major changes to the lesson plan or assessment. For students who took the library workshops in Fall 2019, the UEL and STEM librarians created a refresher slide deck for instructors to integrate into their Blackboard courses.

Table 2. Changes to the FYE Workshops from Spring 2019 to Spring 2020.

	Fall 2018	*Spring 2019*	*Fall 2019*	*Spring 2020*
Lesson Plan and Assessment	See Table 1 for lesson plan detail. Informal assessment only (not returned to instructors or librarians)	No changes until one year of workshops	Several changes, including content and the addition of a graded assignment	Slight content changes for clarity and revision of an assessment question
Scheduling and Registration	Used LibCal system to allow students to register for classes	Accessibility improved in registration form, changed primary classroom	No changes from Spring 2019	No changes from Fall 2019
Team Teaching & Instructors	UEL and STEM Librarians co-taught workshops	Positive feature, added Engineering Librarian	Team teaching continued, added Computer Science Librarian to team, Engineering Librarian retired	No changes from Fall 2019
Attendance & Participation	Registration, in-person check in and informal assessment	Registration, in-person check in, and short worksheet to return to instructors	Registration, in-person check in, and graded assignment	No changes from Fall 2019

Table 3. Attendance at FYE Workshops by Semester.

	Fall 2018	*Spring 2019*	*Fall 2019*	*Spring 2020*
Number of students	157	192	501	86
Instructors requiring attendance	3	4	8	2
Classes taught by librarians	13	13	38	10
% of students attending workshops from each instructor	57, 71, 100	41*, 78, 100, 100	30*, 76, 84, 86, 88, 95, 100, 100	74**, 80
*This instructor required only one person from each project group to attend **This instructor sent both their Cornerstone course and a separate course to workshops				

Assessment - Student Assignment Scores

The assessment part of the workshops included a six-question quiz in PollEverywhere (see Table 4 for assessment questions). When students entered the classroom, they were greeted with a "warm-up" question challenging them to submit their answers to a real engineering dilemma faced by the library via PollEverywhere. This served the dual purpose of setting the tone for the workshop and ensuring that all the students were signed into PollEverywhere, which was required for the graded quiz questions at the end of the session. Because the university has an institutional account, PollEverywhere connects through the proxy system, allowing the librarians to verify the student's attendance, their participation in the workshop, and their quiz grade.

Before the quiz began, the librarians gave brief instructions. They reminded students to have all the databases open on their computers, and encouraged group work, with the caveat that each student needed to submit an answer to receive a grade. The first slide showed only the question students had to answer. Students had between one and two minutes to find the answer in the database. The time limits were meant to keep the class moving rather than restrict students from answering, and extra time was granted when requested. On the following slide, students had 20 seconds to choose their answer from multiple choice options. Most students were able to answer the questions correctly in the amount of time given; however, some students experienced trouble logging into PollEverywhere, while others missed the explanation of the rules or took too long to submit their answers, so not all students who participated are reflected in the quiz numbers below. Generally, the librarians checked whether students were ready to submit their answers before progressing to the next slide.

The quiz opened with an easy question meant to demonstrate how the quiz worked. The following questions allowed the students to explore each of the three databases demonstrated during the workshop and demonstrate their understanding of the concepts covered. On a whole the students did extremely well on the quiz. The librarians did find that students struggled with the concepts of 'highly cited' and 'hot articles' in Web of Science on Question 6. The question was later adapted to just ask for the 'most cited article' for the Spring 2020 workshops which resolved the confusion.

Table 4. Assessment questions and student scores.

Assessment Questions	% Correct	Respondents
Q1: "What do you use to find books at the Library?"	98%	478
Q2: "Do a search in Engineering Village for Chemical Process Safety, what are the top 3 suggested terms associated with this topic."	97%	446
Q3: "Which countries (by record count) are the most active in robotics? List the top 4 countries in descending order (e.g. high to low record count on Engineering Village)."	98%	493
Q4: "Using Engineering Village find the first result from 2019 for 'Biometric Voting Machines' and tell us the document type."	96%	485
Q5: "Using Knovel find the melting point of polyoxymethylene."	95%	484
**Question 6: "Do a search for 'robotics' in Web of Science. Find the most cited, hottest article. What is the article title? How many times has it been cited?"	65%	322
** There are fewer respondents for Question 6 because it was only included in the outside-of-class workshops.		

Assessment - Database Usage

The library has seen a marked increase in usage of Engineering Village since the start of the library workshops in Fall 2018. The following figures represent the number of searches performed in Engineering Village from 2017 through 2019. Searches performed in class were not filtered out from these results, so it's possible that this trend was impacted by students attending and participating during the workshop series. While Spring and Fall 2018 were roughly equivalent in number of searches performed, an increase in usage appears in Spring 2019, followed by an even steeper increase in Fall 2019 (Figure 1). From Fall 2017 to Fall 2018 (when

workshops started), there was a 37% increase. From Fall 2018 to Fall 2019, there was a 122% increase in usage. There was a 34% increase in usage from Spring 2018 to Spring 2019. For usage numbers, please see Appendix 1.
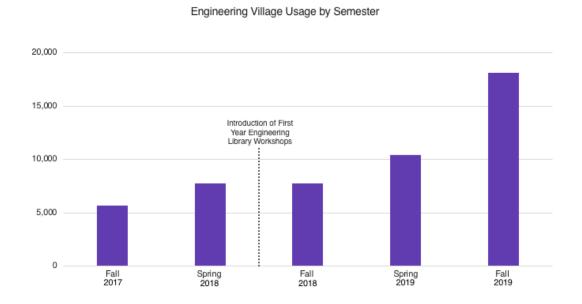

Figure 1. Engineering Village usage by semester.

When looking at usage by academic year (Figure 2), the increase becomes even more defined. The 2019-2020 academic year, which has currently only one semester of data (Fall 2019), has already surpassed the entire 2017-2018 academic year with 18,160 searches as compared to 16,668 searches.
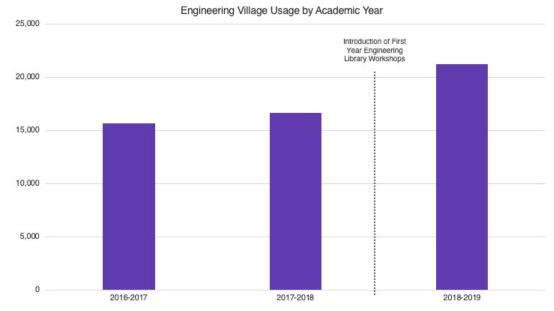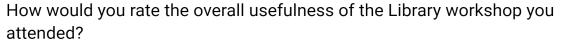
Figure 2. Engineering Village usage by Academic Year.

Assessment - Student Survey

One month after the library sessions were completed in the Fall 2019, students were sent a survey to assess their perceptions and learning outcomes from attending the workshops. The questions focused on use: if they did use, or expected to use, the information they learned; what they used; and the current and expected value of the information in their course and future careers. The survey also included open-ended questions to capture more information and solicit feedback for future improvements.

How would you rate the overall usefulness of the Library workshop you attended?

97 responses

- Extremely useful, I used it in my research
- Very useful, I used it some, hope to use it more in the future
- Somewhat useful, good to know
- Of limited value, hopefully I will use it
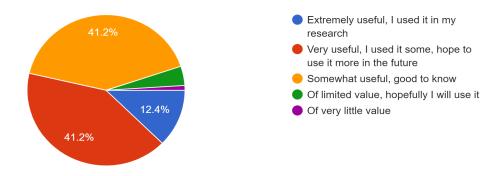- Of very little value

Figure 3: Student question 1.

Learning about the library itself and databases used in research is very important to my academic success:

97 responses

Legend:
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Values shown: 56.7%, 9.3%, 32%

Figure 4: Student Question 2.

In Figure 3, 94.8% of the students rated the workshop as useful in some way, and 53.3% indicated that they had used the information already. In Figure 4, 88.7% saw the value in terms of their academic success, while a very small percentage did not see it as useful or important.

How would you rate the value of learning about citation managers (ex. Mendeley, EndNote, Zotero, RefWorks):

97 responses

Legend:
- Extremely valuable, I used it in my research
- Very valuable, I used it some, hope to use it more in the future
- Somewhat valuable, good to know
- Of limited value, hopefully I will use it
- Of very little value

Values shown: 35.1%, 37.1%, 21.6%

Figure 5: Student Question 3.

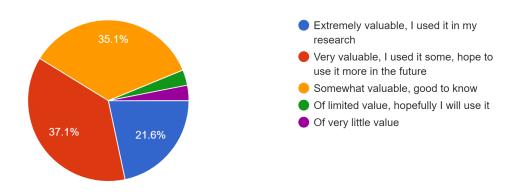Estimate the probability that you will use this information in your engineering career:

97 responses

- Extremely likely, over 90% chance
- Very likely, 80-90%
- Somewhat likely, 60-80%
- Not too likely, 40-60%
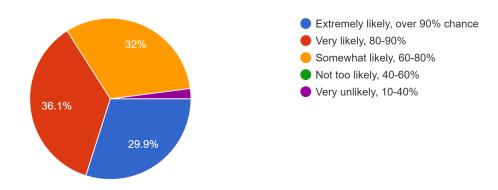- Very unlikely, 10-40%

32%

36.1%

29.9%

Figure 6: Student Question 4.

Figures 5 and 6 continue report on use of citation managers and usefulness in career; 93.8% of students found citation managers valuable in some way, and 98% rate it likely that they will use the information in their engineering careers. These four tables, taken together, clearly reflect that the students found the learning and knowledge valuable, used what they had learned, and regard the information as potentially important for their engineering future, even as first semester engineers. As expected, no table has positive results at 100%, and some students are less enthusiastic.

Students were also asked if they had used any of the databases. Over 40% had used them: 71.8% had used Engineering Village, and others had used Knovel. The remainder of the students had used other web sources.

The first open-ended question asked, "What do you think was the most valuable aspect of the library workshop?" About 80% of the students replied. Approximately one-third of those mentioned the databases, another one-third mentioned citation managers, and the final one-third mentioned knowing about the library resources and the library website, with some overlap between responses. A few students mentioned other citation managers or sites, while one mentioned that they had learned similar information in high school and were glad to know how to access these resources here and apply the same skills. It was interesting that students appreciated gaining awareness of the library resources and site, and it's possible that future sessions can place more emphasis on that portion of the presentation. Some student comments on this question are as follows:

"Discovering all the different academic databases that [sic] are able to use, especially the

engineering ones. I plan on using it for future projects.”

“Just to actually navigate the entire library database and learn the vast network of tools we are able to use.”

“Just getting to know what was valuable for doing research in engineering rather than just doing general research, and also learning how to navigate the site to get the results you want.”

The second open-ended question asked, “What would you like to change or add to these workshops next year?” About 65% of the students responded. One-third of these replied that they would not change anything. Other responses reflect a variety of potential improvements. Nine responses indicated a desire for more depth or more time on citation managers. A few of the students wanted the workshop to be more interactive. Some did not see the value of the quiz and wanted the quiz time to be used for more content delivery. Some student comments on this question are as follows:

“Reminders of what we learned afterwards or somewhere to access what we learned, maybe through email, so we can access this knowledge when doing research for class.”

“Spend some time working on a mock project that almost exclusively applies the library's resources.”

“Perhaps a reference guide students can download in case they forget some of the information.”

These suggestions offer food for thought. More importantly, they demonstrate that students are open to more content, and would appreciate some way to retain the information after the workshop for future projects and assignments. Overall, students clearly see the value of the workshops in their first year, use what they learned, and see themselves using these skills in their engineering careers.

Assessment - Engineering Faculty Survey

Faculty who integrated the library sessions into their course were surveyed after the Fall 2019 semester. Eight faculty members responded, all of whom had made the workshop mandatory for their students to attend. They were sent a survey to assess their perceptions of increased use of references on assignments, improvement in the quality of research, whether students could apply their new skills on multiple assignments, whether the students conveyed a sense of value, and whether the instructors themselves thought the workshops had value and would continue to require them in the future. There were several open-ended questions intended to capture how faculty integrated the workshop into their courses, what they considered most valuable and what could be changed.

For any assignment that required research post workshop there has been a measurable increase in the number of citations used by the students.

8 responses

Figure 7. Faculty Question 1. Scale 1: Strongly Disagree, 2: Disagree, 3: Undecided, 4: Agree, 5: Strongly Agree.

Figure 7 reports the measurable increase in the number of citations students used in their assignments. Here, 7 out of 8 faculty respondents perceive an increase in the number of citations used. The one faculty member who did not perceive improvements commented that they would like to see more coverage about proper in-text citations. Despite showing students examples in their assignment rubrics about how to list a proper in-text citation some students still continued to omit them.

The overall quality of the research my students conduct has improved since the workshop.

8 responses
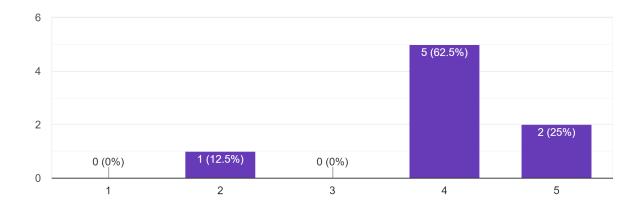

Figure 8. Faculty Question 2. Scale 1: Strongly Disagree, 2: Disagree, 3: Undecided, 4: Agree, 5: Strongly Agree.

Figure 8 reports on the quality of the research done used in their assignments. Here, six out of eight faculty respondents perceive an increase in the quality of citations used. After the workshop, students were more likely to use science and engineering databases and reference journal and conference proceedings as opposed to non-scholarly web-based resources.

My students can use what they learned in the workshop on multiple assignments.

8 responses

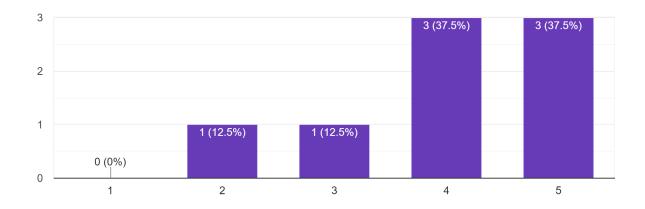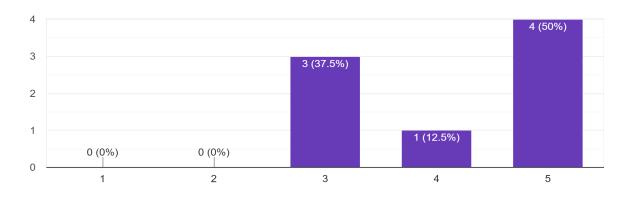Figure 9. Faculty Question 3. Scale 1: Strongly Disagree, 2: Disagree, 3: Undecided, 4: Agree, 5:

Strongly Agree.

Figure 9 reports on whether the faculty member expects that the workshop will be valuable on multiple assignments. Here, four of the faculty strongly agree, one agreed, and three were undecided at the time the survey was administered during the semester. The latter result is not unexpected, as there were several faculty using the workshop for the first time.

The final open-ended questions asked faculty how they are using the workshop, the most valuable aspect of the workshop and whether there are changes they would like to see.

Question 1. Describe how you use this workshop in your course(s)?
Here, faculty describe integrating the workshop into research presentations or for background research related to design projects:

"The workshop is used in conjunction with a research presentation that students work on in teams. This is their first assignment in doing research on a topic for their design project. It is then used to conduct further research into their design projects this semester and next."

"The workshop occurred during class, in a week in which students were asked to find and use scholarly references to do research for a weekly assignment. The assignment related to their team design project."

"...the First Year Engineering library workshop was mandatory for at least 1 student in each 3-4 person team. Each attendee was then required to share their experience with teammates and document their notes in a team assignment. They also answered 2 questions in that assignment about the database that they used (usually Engineering Village and ScholarOne) and how the team conducted their literature review for their free-choice SparkFun project proposal."

"I have students attend right before their research presentation, it is required and on the steps for the project. I discuss it, and they report that it really helped. When they do their next project, I will refer to it in that assignment and require sourcing and citations."

"Literature review and citations in the research phase of the final group project."

Question 2. What do you feel is the most valuable aspect of the workshop?
Faculty responses differed, but they feel the workshop is generally helpful. They comment on the importance of creating a level playing field by developing all students' familiarity with databases, ability to use multiple sources, and experience as self-directed learners.

"Giving the students an alternative avenue of finding information other than a Google search."

"The familiarization with databases and with citation management software."

"By attending the library workshops, my students directly experience and practice how to conduct a proper, peer-reviewed scholarly literature search…"

"Just a basic introduction to Research resources is useful for some aspects of this course but I see it being really important for future courses."

"Both the use of sites and searching and citation managers help the students."

"They don't all have the same level of research knowledge/experience. This gives me a better baseline since some come in with 0 research experience from High School so at least I'll know they can find resources."

Question 3. What would you change or add to the workshop?
Faculty had several suggestions, including holding the workshop in class rather than having students attend out of class time, teaching students how to write in-text citations, increasing capacity, and moving the workshop to the engineering seminar course rather than the Cornerstone.

"Nothing to the workshop itself however I would like to find a time to conduct it in class after the presentation assignment so they can experience it as a team."

"I would like to add a discussion about what constitutes a scholarly source and what academics look for when assessing a source."

"Please add more coverage about proper in-text citations. For example: sentence or photo (author name, 2018) or (author name, page #)…."

"If I could, I'd have them take it in the seminar class early in the semester since this is a more universal thing and these skills are something they should already have coming in to College…"

"I'm going to see about having this done in class early in the semester next time."

Conclusion

Working collaboratively, the FYE Program directors and the library team accomplished their goal: to introduce new engineering students to key resources, tools, and practices for research. The increased usage of engineering databases, positive feedback from faculty and students, and noticeable improvements in students' research and presentations speak to the success of the program. Students found that having the workshops scheduled around the start of research or

design projects was invaluable. Faculty appreciated the improved quality of students' work and presentations. Faculty who attended the workshops themselves found the content to be a valuable addition to the curriculum. Based on this observation and feedback, the FYE Program will continue to expand the library workshops for future academic years.

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Appendix 1: Engineering Village Usage

Engineering Village 2019-2020 School Year

	Jul-19 to Jun-20 Totals	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Fall Semester Totals	Spring Semester Totals	Summer Semester Totals
Compendex Frontfiles	Searches_Regular	6573	223	134	3597	2248	310	61							6216	0	357
*GeoRef**	*Searches_Regular*	0	0	0	0	0	0	0							0	0	0
Inspec Frontfiles	Searches_Regular	6672	217	132	3669	2274	317	63							6323	0	349
Knovel Academic	Searches_Regular	4915	149	74	2662	1833	180	17							4692	0	223
Total for all databases		**18160**	**589**	**340**	**9928**	**6355**	**807**	**141**	**0**	**0**	**0**	**0**	**0**	**0**	**17231**	**0**	**929**

Engineering Village 2018-2019 School Year

	Jul-18 to Jun-19 Totals	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Fall Semester Totals	Spring Semester Totals	Summer Semester Totals
Compendex Frontfiles	Searches_Regular	5629	148	114	536	1068	317	66	914	1206	397	203	414	171	1987	2720	847
GeoRef	Searches_Regular	4955	144	111	498	1064	294	51	816	1175	388	140	326	92	1907	2519	673
Inspec Frontfiles	Searches_Regular	5531	151	111	520	1076	318	51	856	1198	398	192	424	170	1965	2644	856
Knovel Academic	Searches_Regular	5114	142	111	496	1062	294	51	820	1185	388	138	322	98	1903	2531	673
Total for all databases		**21229**	**585**	**447**	**2050**	**4270**	**1223**	**219**	**3406**	**4764**	**1571**	**673**	**1486**	**531**	**7762**	**10414**	**3049**

Engineering Village 2017-2018 School Year

	Jul-17 to Jun-18 Totals	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Fall Semester Totals	Spring Semester Totals	Summer Semester Totals
Compendex Frontfiles	Searches_Regular	4380	180	141	898	318	179	77	1112	648	220	71	361	175	1472	2051	857
GeoRef	Searches_Regular	4048	175	130	827	300	174	73	1020	583	220	71	302	173	1374	1894	780
Inspec Frontfiles	Searches_Regular	4192	173	133	883	304	181	73	1049	583	228	72	339	174	1441	1932	819
Knovel Academic	Searches_Regular	4048	176	129	827	300	174	73	1020	583	220	71	302	173	1374	1894	780
Total for all databases		**16668**	**704**	**533**	**3435**	**1222**	**708**	**296**	**4201**	**2397**	**888**	**285**	**1304**	**695**	**5661**	**7771**	**3236**

Engineering Village 2016-2017 School Year

	Jul-16 to Jun-17 Totals	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Fall Semester Totals	Spring Semester Totals	Summer Semester Totals
Compendex Frontfiles	Searches_Regular	4318	282	270	1,071	356	152	149	616	386	268	111	517	140	1,728	1381	1209
GeoRef	Searches_Regular	3912	280	257	956	328	138	137	542	372	264	107	409	122	1559	1285	1068
Inspec Frontfiles	Searches_Regular	4056	285	257	973	348	138	150	581	383	276	116	424	125	1609	1356	1091
Knovel Academic**	Searches_Regular	3390	0	0	957	328	139	138	542	373	274	111	410	118	1562	1300	528
Total for all databases		**15676**	**847**	**784**	**3957**	**1360**	**567**	**574**	**2281**	**1514**	**1082**	**445**	**1760**	**505**	**6458**	**5322**	**3896**

**GeoRef was not renewed in FY2020

**Knovel Academic did not provide statistics for July and August of 2016