

Library Assessment Project Report:

Upper-Level STEM Student Library Use Study

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Executive Summary

The purpose of the Upper-Level STEM Student Library Use Study was to determine the amount of library instruction received by undergraduate science, technology, engineering, and mathematics (STEM) students at Florida Atlantic University (FAU), the information resources they use, and their perceived level of confidence in using library resources. The study also gauged student satisfaction with library services, facilities, and technology with 75% as a goal for overall satisfaction rating. 333 students participated, falling short of the desired sample size, and reached 93% of the number needed to gain a statistically significant sample size of 357. A 20-item survey was administered from November 2016 through March 2017 and gathered standardized student responses to make inferences about the undergraduate STEM student body. Survey results showed that participants were generally satisfied with library services, information sources, and technology since the average satisfaction rating was 59%. This, as well as satisfaction with the building and study spaces, at 52%, fell short of the goal of 75% indicated in the study proposal. Participants expressed more confidence in using the library if they had library instruction sessions although the association was small, according to the results of a correlation test that was employed. Participants were more likely to use the library as a place to study but less likely to use its information resources, and often used search engines to find information for academic purposes. Results of the study recommend improvements to study spaces and in promoting library services. The results also suggest conducting user studies of students in other majors and also faculty to gain a comprehensive view of library use.

Survey Results

- The majority of the 333 undergraduate STEM student respondents were in their third year or beyond in their program. 57% of the participants were between the ages of 21 and 24 years old with the most responses from majors in Biology (18%), Mechanical Engineering (18%), and Computer Science (10%) (see Figure 1).
- 47% of the respondents were male with 42% being female. 48% of respondents self-identified as White and while 43% were either bi- or multi-racial or a member of a minority racial or ethnic group.
- Overall, the percentage of minority racial or ethnic students who participated in this survey (43%) was higher than their national graduation averages of 32% (National Science Foundation, 2016) and reflect the diversity of FAU's STEM student body (see Figure 2).
- More students (43%) reported learning about the library and its information sources through their professor, TA, instructor, tutor, or adviser, or through a classmate, friend, or University/library announcement (each at 29%) (see Figure 3).
- Survey results showed that participants were generally satisfied with library services and information sources, since the satisfaction rating for services was 61%, with 58% for information sources and 58% for facilities (see Figure 4).
- The average satisfaction rating for services, information sources and technology was 59%, which is 16% below the initial goal of 75% indicated in the study proposal.

- Students showed the least satisfaction with study spaces (45%) (see Figure 4).
- Less than one-third of the STEM students (29%) surveyed either had a library instruction session or research consultation with a librarian (see Figure 5).
- More than half of the respondents (55%) said they felt confident about using the library's information sources, a quarter of respondents were neutral, and 20% disagreed (see Figure 5).
- Participants expressed more confidence in using the library if they had a library instruction session, although the association was small, according to the results of a correlation test that was employed indicating the higher the number of library sessions attended by a student the higher the level of confidence in using the library.
- 38% of the students surveyed indicated that they did not use the library or the library's website to get publications to help do assignments. More respondents, 47%, said that they use the library or the library's website to get research articles for their assignments, with 32% indicating books and 22% government documents or reports (see Figure 7).
- 36% of student participants did not use e-resources, while half or 50% of the students surveyed used SearchWise, a discovery tool for searching across a variety of print and electronic resources that the FAU Libraries provide access to, followed by Google Scholar (29%) (see Figure 7).
- Only 13% of students surveyed indicated they use subject databases, with only 6% using Web of Science specifically (see Figure 7).
- Students widely reported using internet sources for their school work, including search engines at 84% and websites at 62%, with 46% indicated they used Wikipedia (see Figure 8).
- 57% of the student respondents indicated they used the library to study or do work for at least one hour of the week or more, while 24% indicated that they did not use it at all (see Figure 9).
- More than half (53%) of the student respondents indicated they did not use the library's information sources from off-campus, while 30% used them less than one hour a week (see Figure 9).

Recommendations

- Utilize survey results, especially the qualitative comments, to identify student needs for study space and to assist with planning and reconfiguring library space.
- Ensure cleaner areas and make more power outlets available in all study areas and improve lighting.
- Create quiet, individual, group, and low-conversation study areas and enforce quiet study spaces.
- Provide additional seating and tables along with upgraded furniture in the study spaces and throughout the library.
- Provide additional computers and also additional technology in study rooms.
- Investigate allowing students to take laptops from the building and enhancing WiFi access at the ends of the building.

- Investigate providing more access to technology such as plotters, a 3D printer, and VMWare so that engineering students could access software available through CECS.
- Identify the factors that influence STEM students' use of library resources and find where library services do not address STEM student needs through follow up focus groups.
- Investigate why 24% of STEM student respondents do not use the library to study or do work through surveys, focus groups or interviews.
- Employ objective means of gathering information (e.g., quizzes) to determine actual student skills in finding library information sources.
- Gather data through Google Analytics, focus groups, and other means to explore student uses of subject databases.
- Conduct more outreach and marketing with the College of Science (COS) and College of Engineering and Computer Science (CECS) through embedding librarians in their courses and announcing library activities and services through University announcements so that STEM students know what services and resources are available to them.
- Investigate providing more tutorials, orientations and tours for students, so they know what is offered by the library.
- Promote the library and its services through individual and group meetings with faculty by showing how they address specific academic and information needs of students.
- Expand library use studies to include faculty as well as students in other majors and colleges.

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Introduction

Based on my personal experience as a reference librarian and providing library instruction, it appears that students have a tendency to over-rate their research and library use abilities, so their self-perceived skill levels may be higher than their actual ones. Academic libraries have always strived to assist students in developing these skills and are reinventing their services to be responsive to their students' success. Libraries can effectively determine how they are doing this using multiple means. One approach is to perform a user study to explore how students use the library and also their perceptions of its services. The information gained can provide the basis for enhancements and improvements in library services, and may also show where gaps in services exist.

The purpose of the Upper-Level STEM Student Library Use Study was to determine the amount of library instruction received by undergraduate science, technology, engineering, and mathematics (STEM) students at Florida Atlantic University (FAU), the information sources they use, and their perceived level of confidence in using library resources. The Upper-Level STEM Student Library Use Study gathered data by administering a survey to undergraduate STEM students at FAU to determine their library use. One objective of the study was to share the survey results with STEM faculty to initiate conversations about possibilities for the library to be embedded in their curricula, and another was to provide STEM and library colleagues with a snapshot of how students are using the library. An additional objective, related to this purpose, was to measure student satisfaction with library services, facilities, and technology. An overall satisfaction rate of 75% for services, information sources, and technology was indicated in the study proposal as a goal.

Methodology

A survey was created to gather student responses using instrumentation that allowed responses to be standardized and then analyzed. Survey research can be used to discover the incidence, distribution, and interrelations of variables by concentrating on a representative sample of people at a certain point in time (Kerlinger and Lee, 2000), and was an appropriate methodology for studying attributes of library use and perceptions. The survey was designed and administered by Kristy Padrón, the primary investigator, with input from the Assistant Dean for Information Technology, Assessment and Project Management and input and final approval from the Dean of University Libraries. The survey was statistically tested to ensure item validity, and then underwent review by the FAU Institutional Review Board that granted it Exempt Status.

Student responses were gathered using a survey with 20 questions. Nineteen were multiple choice with some including open-ended responses where participants could provide their own answers and one was an open-ended question; see Appendix I for a copy of the survey. The questions focused on the following topics:

- Anonymous demographic information about participants;
- Number of library instruction or research consultation sessions with a librarian;

- How students learned about the library;
- Amount of library use and confidence in using the library;
- Use of library publications and electronic resources (e-resources);
- Use of Internet resources to assist with assignments;
- Amount of time used for library study and off-campus library use; and
- Satisfaction with library services, information sources, technology, and the building and study spaces.

Student responses to the survey were tabulated and analyzed to identify patterns and associations in library use, satisfaction, and confidence in using the library. Survey responses were coded and then analyzed by SPSS 24, while open-ended responses were organized using ATLAS.ti.

Most student responses were analyzed for distribution and often presented by using percentages. The questions regarding use of publications and information sources were multiple choice and participants could select multiple sources. Other questions that measured the frequency of library use were multiple choice where only one selection could be made. A Likert Scale was used so students could rank their levels of satisfaction and also self-perceived confidence and skills of library use. The final survey question was an open-ended question and solicited student opinions that were organized by broader category and then listed.

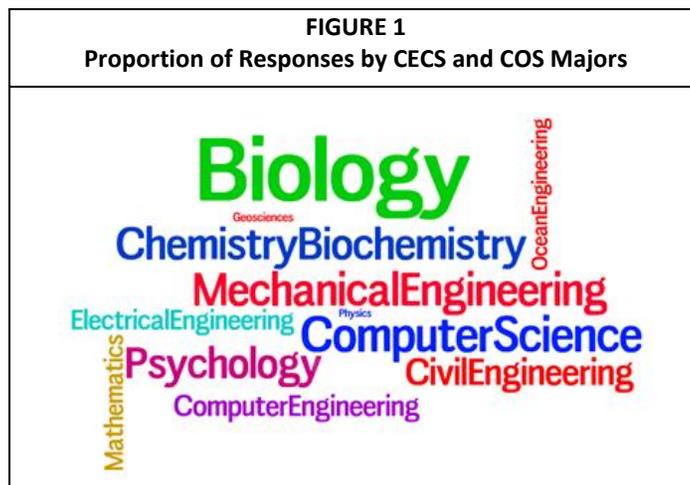
Sampling. According to FAU Institutional Effectiveness and Analysis (2017), 4,992 undergraduate students declared majors in the FAU College of Science (COS) and College of Engineering and Computer Science (CECS) during the Fall 2016 semester. To reach a representative sample size, the goal was to have 357 participants in the survey¹ out of the 4,992 students. 333 students participated, falling short of the desired sample size, and reached 93% of the number needed to gain a statistically significant sample size. Student participation was completely voluntary, and participants did not receive compensation.

Administration. The survey was distributed by the primary investigator to third- and fourth-year classes in the COS and CECS held at the FAU Boca Raton campus. The rationale was that students in their junior or senior years were more likely to be committed to a STEM major at that point of their studies. The survey was available in a print format and also through an online equivalent with identical questions (hosted by LibSurvey by Springshare). CECS and various departments within COS assisted with distributing the online version of the survey to students who declared a science or engineering major.

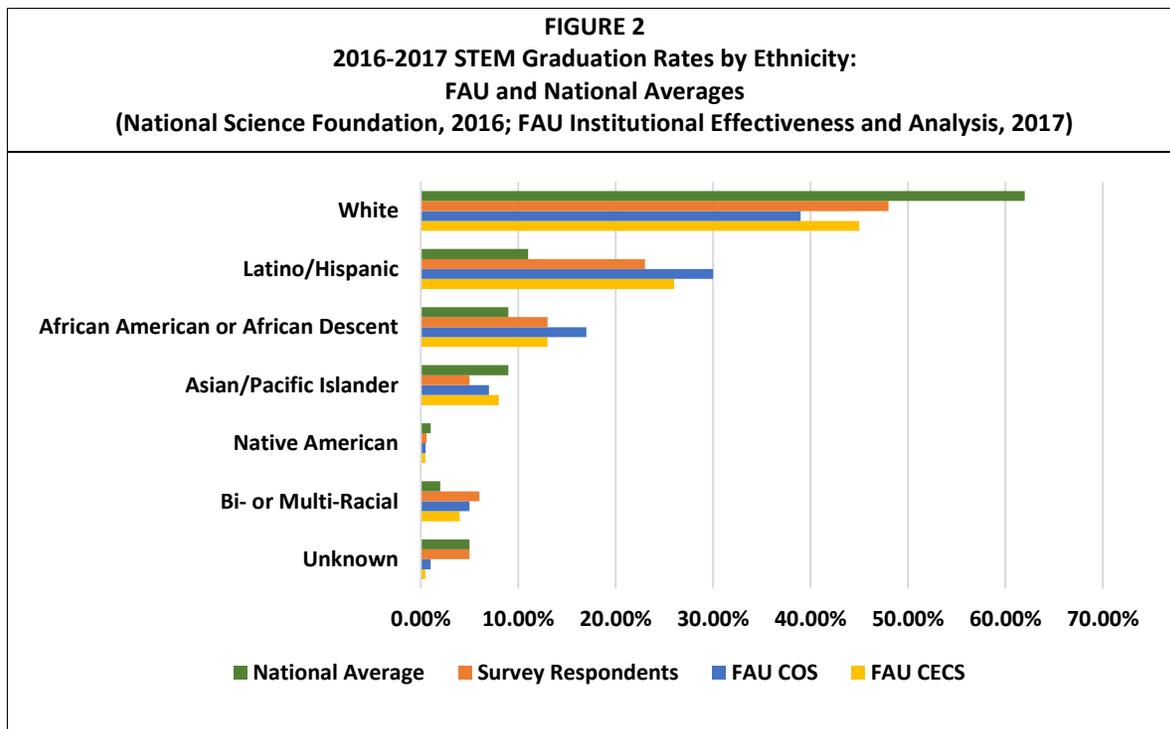
Participants. 333 undergraduate STEM students participated in the study. The majority of the students were in their third year or more of their program. 57% of the participants were between the ages of 21 and 24 years old with the most responses from majors in Biology (18%), Mechanical

¹ The sample size of 357 participants was established by the Creative Research Systems online statistical calculator at <https://www.surveysystem.com/sscalc.htm> and verified by the FAU Division of Research, with a confidence level of 95% and a confidence interval of 5.

Engineering (18%), and Computer Science (10%); see Figure 1 for proportions of responses by major.



47% of the respondents were male with 42% being female. 48% of respondents self-identified as White and 43% identified as either bi- or multi-racial or a member of a minority racial or ethnic group. Overall, the percentage of minority racial or ethnic students who participated in this survey was 11% higher than their national graduation average of 32% in STEM majors (National Science Foundation, 2016); this reflects the diversity of FAU's STEM student body (see Figure 2). The results of this survey may produce valuable insights about these underrepresented students in STEM, their library use, and their academic success.

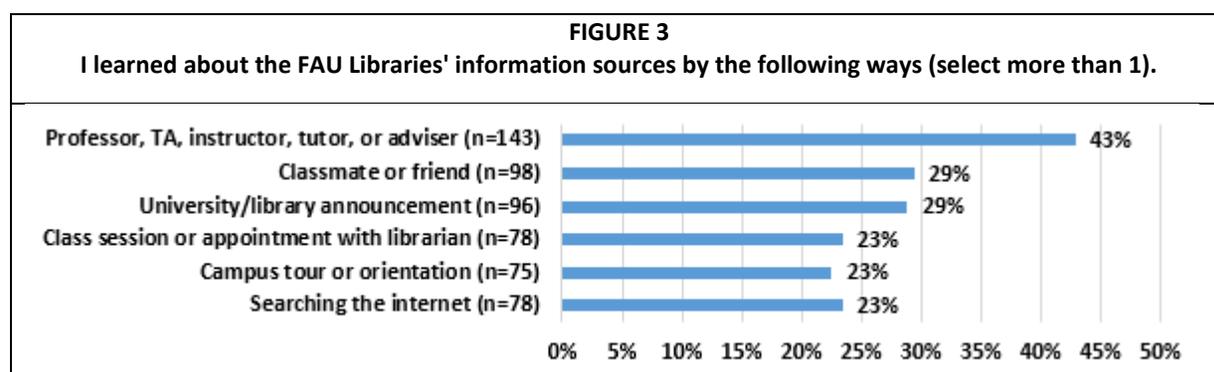


Results

Library Referrals.

More students reported learning about the library and its information sources through their professor, teaching assistant, instructor, tutor, or adviser (43%; see Figure 3). They were also likely to get this same information from a classmate or friend, or through a University/library announcement (both at 29%). Almost one out of every four students said they heard about the library through a class session, appointment with a librarian, campus tour or orientation, or by searching the internet (each at 23%).

22 students provided open-ended comments about where they heard about the library and its information sources. They most frequently said they learned about the library through a self-directed visit or through trial and error (each with 5 responses). They also learned about the library through specific classes or programs (2 responses), or said they never heard of the library (5 responses).

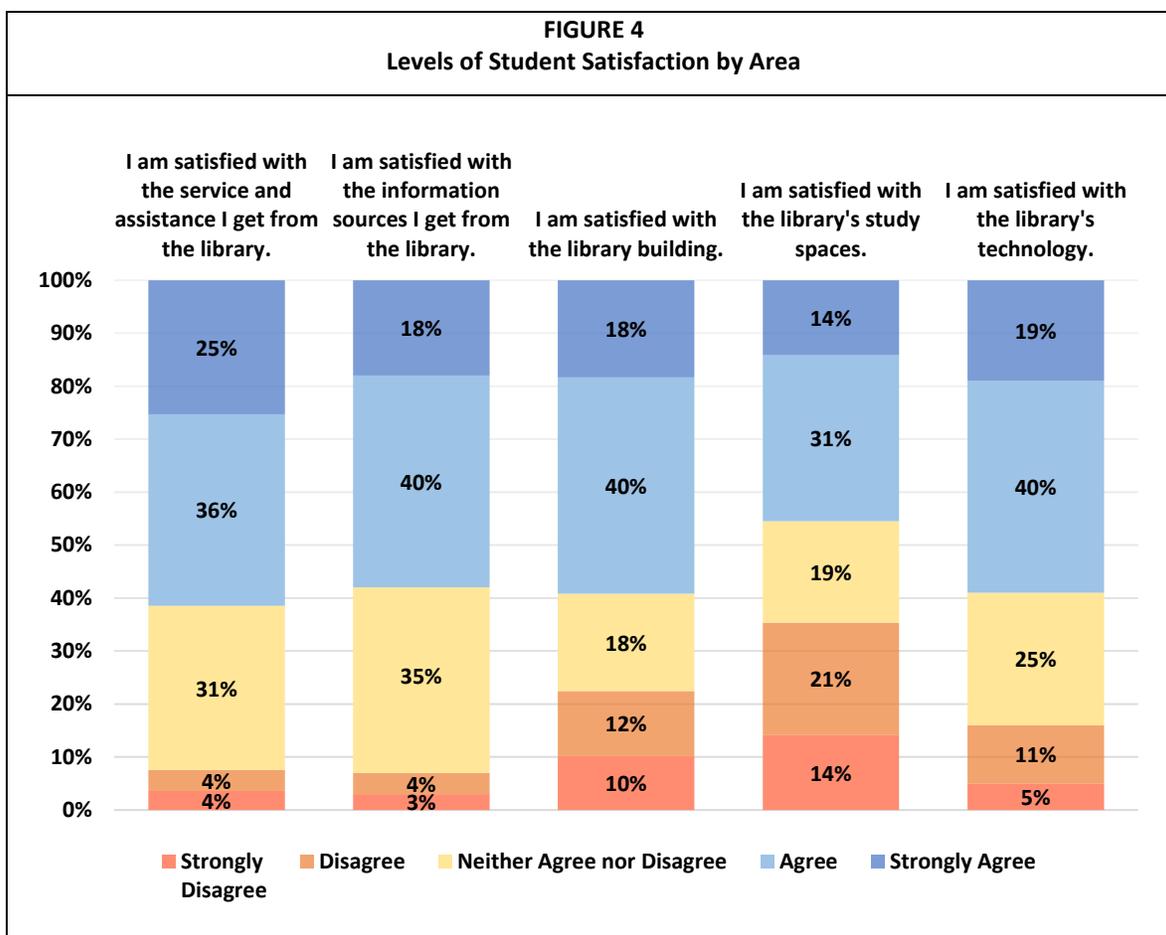


Service, Information Sources, Facility, and Technology Satisfaction.

Library Services and Information Sources. Student satisfaction was determined by their statements of “strongly agree” and “agree” to specific survey questions. Satisfaction was the lowest for library spaces (45%; see Figure 4) and the highest was for service and assistance (61%). The average satisfaction rate for library services, information sources, and technology was 59%, falling short of the goal of 75% indicated in the study proposal.

The majority of students were satisfied with the library’s services. 61% of students either agreed or strongly agreed that they were satisfied with library services, while 31% were neutral. 58% of students expressed satisfaction with the information sources provided by the library. Around one-third of participants rated their satisfaction in these areas as neutral.

The survey’s open-ended question asked participants for feedback regarding library services; see Appendix II. Comments suggested better promotion of the library’s services, resources, and events. They also recommended tutorials, orientations, and tours for students so they could know what is offered by the library.



Library Building and Study Spaces. While 58% of the respondents were satisfied with the building, 22% indicated disagreement. Many of the open-ended comments suggested renovations, upgrades, or a new building (see Appendix II):

“FAU is growing, therefore so should the library.”

“Our library could use a sweeping physical revamp. Visit any other university’s library (especially neighbors NSU or even FIU). FAU’s library pales in comparison and looks/feels extremely dated as well.”

Only 45% of the students surveyed indicated that they were satisfied with study spaces while 35% indicated disagreement. Much of the feedback in the open-ended questions suggested improving study spaces and lighting, and enforcing quiet study spaces (see Appendix II). Students also wanted to see cleaner areas. Students consistently requested more power outlets to be available in all study areas. They suggested creating quiet, individual, group, and low-conversation study areas. Students also wanted additional seating and tables along with upgraded furniture in the study spaces and throughout the library.

Technology. Overall, students were satisfied with the library's technology (59%) while one-quarter of the responses were neutral. Their open-ended responses in Question 20 provided additional suggestions (see Appendix II). Students wanted additional computers in the library and also technology included in study rooms. A few comments indicated liking the availability of laptops and other equipment, but wanted to be able to take them from the building. Some wanted enhanced WiFi access at the ends of the building, and to see additional technology in study rooms. A few engineering students requested access to technology such as plotters, a 3Dprinter, and VMWare so they could access software available through CECS, while some wanted the former AutoCAD lab in classroom LY136 to be available to them.

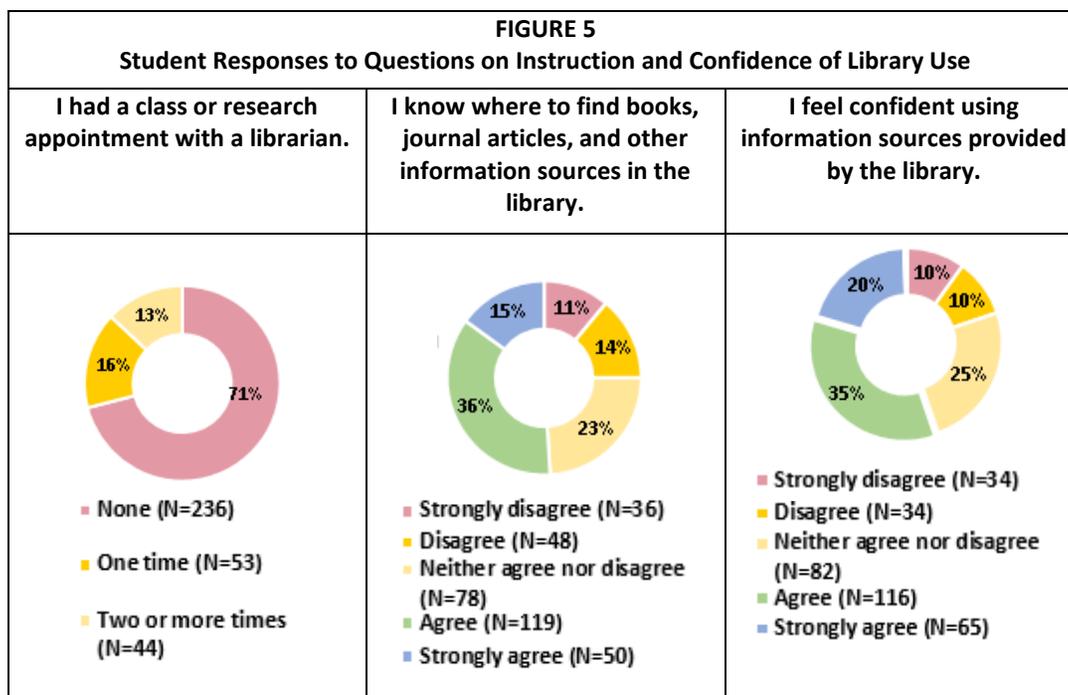
Instruction Sessions, Research Consultations, and Confidence in the Use of the Library.

Less than one-third of the STEM students surveyed (29%) either had a library instruction session or research consultation with a librarian (see Figure 5). However, over half of all survey respondents (55%) said they felt confident about using the library's information sources, a quarter of respondents were neutral, and 20% disagreed. When asked about whether they can find books and other information sources in the library, 51% of the students said they could while 23% were neutral. 25% of the students did not know, with these results being very similar to their level of confidence in using the library.

An initial purpose of this study was to examine the association between STEM students' level of confidence with using the library and the number of sessions or consultations they received using a test for correlation. A two-tailed Kendall's tau-b correlation² was used, which generated a correlation coefficient of .216 ($\tau_b=.216$), showing a small though positive association between number of library sessions or consultations received by students and their levels of confidence in library use. The p value of .005 ($p \leq .005$) generated from this test further indicates that there is only a minimal chance (.5%) that the correlation coefficient is not correct, and also shows this is a statistically significant and accurate result.

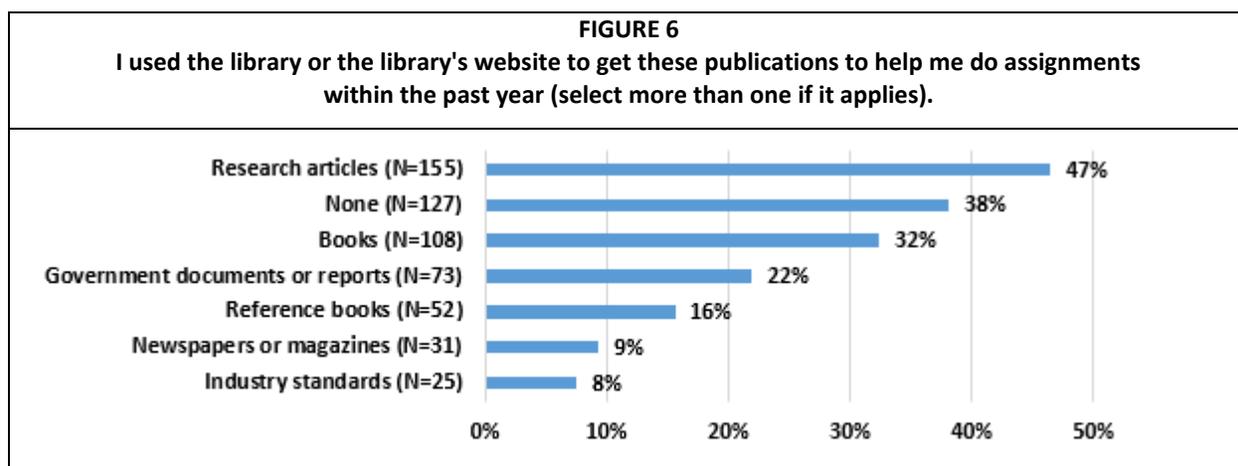
² Kendall's tau-b was used for analysis because the data from the survey fulfills the assumptions needed to gain a valid result: the data analyzed was ordinal data that could be ranked by a specified level (i.e., confidence and number of library instruction sessions), and a chart view of the data showed that confidence in using the library and library sessions had a monotonic relationship where an increase of one variable resulted in either an increase or decrease of another (Laerd Statistics, 2013).

A two-tailed test was used to study the associations of confidence and library sessions because the primary investigator wanted to discern whether or not library sessions had either a negative or positive association with confidence in using the library, which is where a two-tailed test can be utilized (UCLA Institute for Digital Research and Education, 2017).

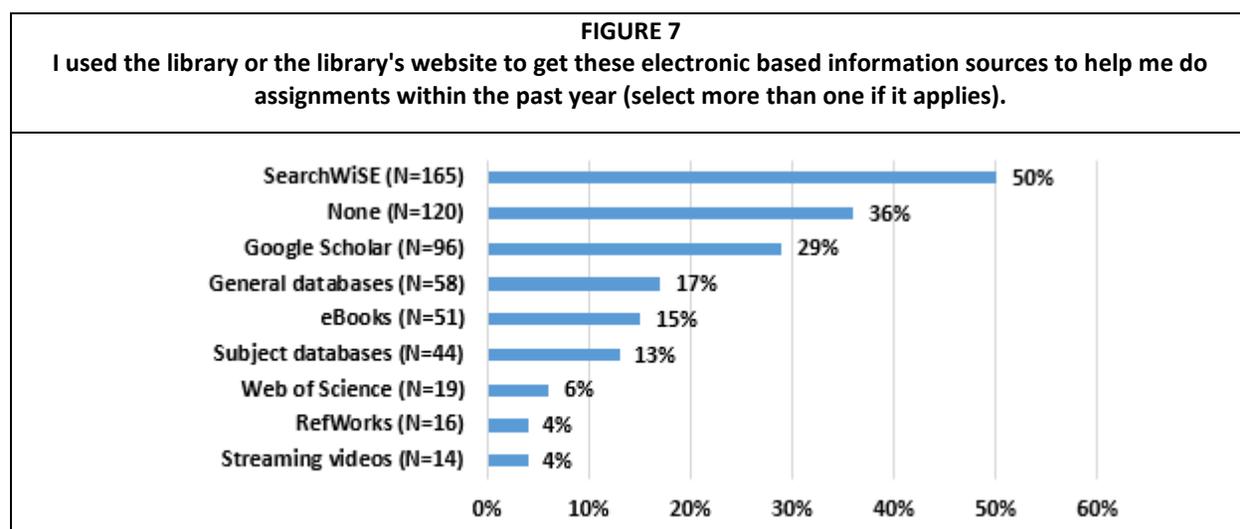


Print Publication and E-Resource Use.

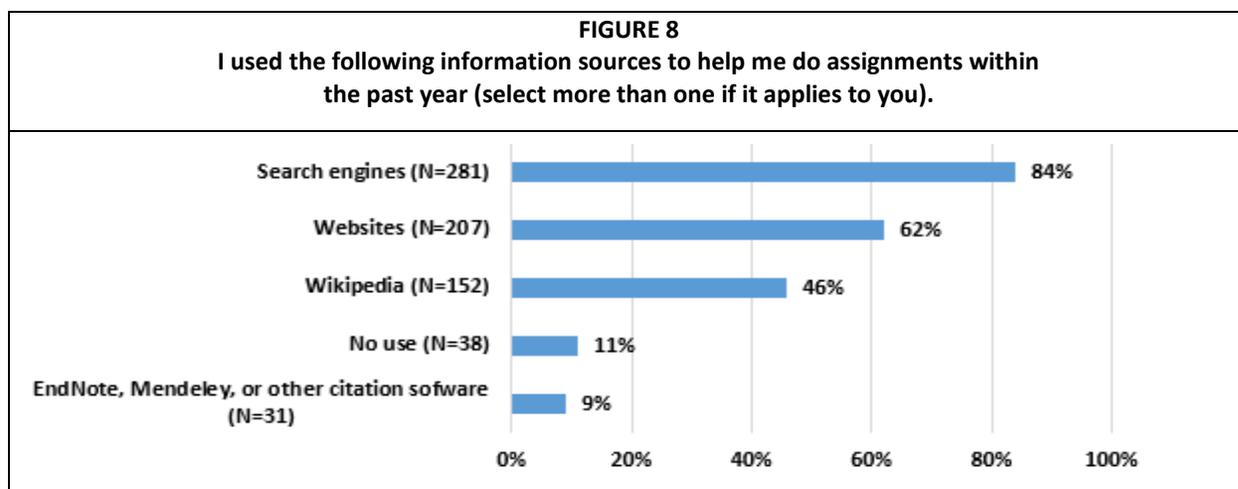
Publication Use. Less than half of the 333 student participants said they used a variety of publications through the library and its website (see Figure 6). Most respondents either used research articles (47%) or did not use any publication (38%) from the library. Students then reported using books related to their subject area (32%) and government documents or reports (22%). One out of six students or less said they used reference books, newspapers, or industry standards.



E-Resources Use. Similar patterns of use were found between publications and electronic resources (e-resources). 36% of student participants did not use e-resources (see Figure 7). Half, however, used SearchWiSE, a discovery tool for searching across a variety of print and electronic resources that the FAU Libraries provide access to, followed by Google Scholar (29%). All other e-resources (general and subject databases, eBooks, RefWorks, and streaming videos) were used by less than one out of six students. Only 13% of survey respondents indicated they used subject databases with few students, 19 out of 333, specifically using Web of Science.

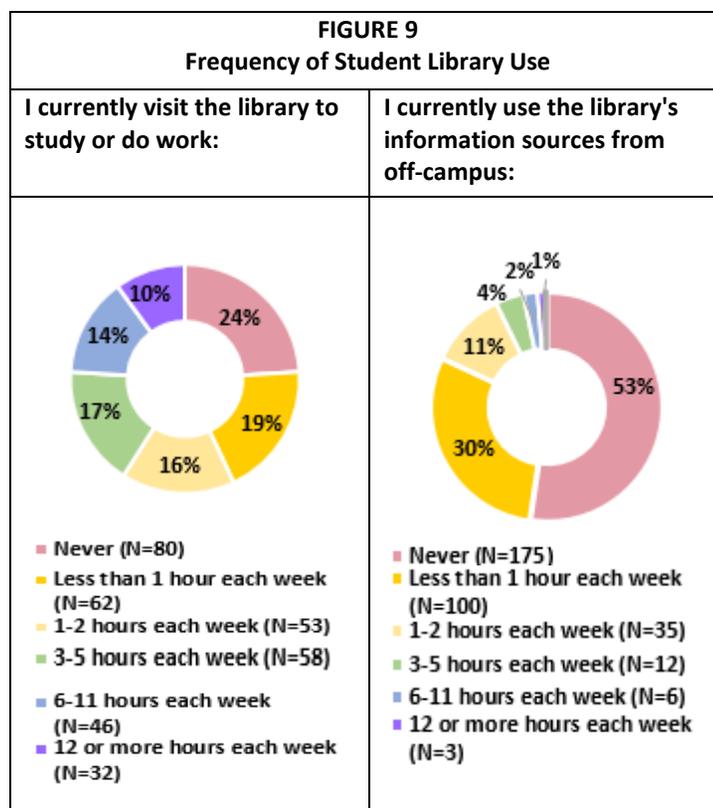


Internet Use. Students widely reported using Internet sources for their course work (see Figure 8). They were highly likely to use search engines (84%) and websites (62%), and were almost half as likely to use Wikipedia (46%). Only 11% said they did not use any of the listed information sources for assignments, and slightly fewer (9%) used a different citation management software than the library-provided, which is RefWorks.



Building Use and Off-Campus Use.

57% of the student respondents used the library to study or do work for at least one hour of the week or more, while 24% of them did not use the library at all (see Figure 9). The majority of students did not use library's resources from off-campus (53%) while 30% used them less than 1 hour a week.



Study Limitations

One limitation is that the survey does not evaluate the participants' skill levels in using the library through an objective means such as a test. A more empirical means of gathering skill levels, such as problem-based questions, could be used to find objective measures and also verify the association between student confidence in using the library and library skills. Also, the participants' self-ratings of confidence in using the library and their library skills may not be accurate. Based on my experience as a reference librarian and providing library instruction, it appears that students have a tendency to over-rate their research and library use abilities, so their self-perceived skill levels may be higher than their actual ones.

Another limitation is the number of participants in this study. With its 333 participants, this study fell short of the 357 needed for a statistically representative sample size.

Finally, factors that influenced students to volunteer for this survey are not known. Students who already had a strong opinion of the FAU Libraries, either favorable or not, may have been more likely to participate, potentially influencing the accuracy of the results.

Recommendations

- Utilize survey results, especially the qualitative comments (See Appendix II), to identify student needs for study space and to assist with planning and reconfiguring library space.
- Ensure cleaner areas and make more power outlets available in all study areas and improve lighting.
- Create quiet, individual, group, and low-conversation study areas and tables along with upgraded furniture in the study spaces and throughout the library, and enforce quiet study spaces.
- Provide additional seating and tables along with upgraded furniture in the study spaces and throughout the library.
- Provide additional computers and also additional technology in study rooms.
- Investigate allowing students to take laptops from the building and enhancing WiFi access at the ends of the building.
- Investigate providing more access to technology such as plotters, a 3D printer, and VMWare so that engineering students could access software available through CECS.
- Identify the factors that influence STEM students' use of library resources and find where library services do not address STEM student needs through follow up focus groups.
- Investigate why 24% of STEM student respondents do not use the library to study or do work through surveys, focus groups or interviews.
- Employ objective means of gathering information (e.g., quizzes) to determine actual student skills in finding library information sources.
- Gather data through Google Analytics, focus groups, and other means to explore student uses of subject databases.
- Conduct more outreach and marketing with the College of Science (COS) and College of Engineering and Computer Science (CECS) through embedding librarians in their courses and announcing library activities and services through University announcements so that STEM students know what services and resources are available to them.
- Investigate providing more tutorials, orientations and tours for students, so they know what is offered by the library.
- Promote the library and its services through individual and group meetings with faculty by showing how they address specific academic and information needs of students.
- Expand library use studies to include faculty as well as students in other majors and colleges.

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Appendix I: Upper-Level STEM Student Library Use Study – Survey (Print)**Upper-Level STEM Student Library Use Study
2016-2017****Informed Consent Statement**

You are being asked to complete an online questionnaire as part of a FAU Libraries study of science, technology, engineering and mathematics (STEM) students; an identical questionnaire is available in a paper/print format by request. This study will determine the amount of times these students had classes with librarians, the information sources they used, their confidence in using library information sources, and their feedback of library services and facilities. The results will inform the FAU Libraries of library instruction needs, patterns of library use, and suggestions and feedback for upper-level STEM students.

This questionnaire should take 10 minutes to complete and your participation is voluntary; you are free to withdraw at any time. **Please do not participate in this study if you are under 18 years of age.** There are minimal risks in participating in this study. Completing this questionnaire is your agreement to participate.

The demographic information and responses will be kept confidential and will be used to evaluate student needs for library instruction, study patterns of library use based on these factors, and collect feedback regarding library services and facilities.

Questions regarding this study or questionnaire can be directed to the primary investigator, Kristy Padrón, Assistant University Librarian, FAU Libraries, kpadron@fau.edu, (561) 297-4318. Requests for a copy of this informed consent statement can be provided by contacting the primary investigator; it can be provided when the questionnaire is being given or emailed by request.

For any questions regarding your rights as a research subject, please contact the Florida Atlantic University Division of Research at (561) 297-0777. This study has been reviewed by and given Exempt Status from the FAU Institutional Review Board (Project #426914-2, approved on March 27, 2013).

Your participation is greatly appreciated!

Please provide some basic demographic information about yourself.

1. Age:

- 18 – 20 years old.
 21 – 24 years old.
 25 – 28 years old.
 29 – 37 years old.
 38 – 46 years old.
 47 – 54 years old.
 55 years old or more.

2. Gender:

- Female.
 Male.
 I choose not to identify.
 Other (Please specify:) _____

3. Major:

- Biology (all programs).
 Chemistry & Biochemistry.
 Civil Engineering.
 Computer Engineering.
 Computer Science.
 Electrical Engineering.
 Geomatics Engineering.
 Geosciences (all programs).
 Mathematical Sciences.
 Mechanical Engineering.
 Ocean Engineering.
 Physics.
 Psychology.
 Other (Please specify): _____

4. FAU Class Level:

- 1st Year Undergraduate.
 2nd Year Undergraduate.
 3rd Year Undergraduate.
 4th Year Undergraduate.
 5th (or More) Year Undergraduate.
 Undergraduate earning a second Bachelor Degree (in Arts or Sciences).

5. Ethnicity:

- White.
 African American or African Descent.
 Latino / Hispanic (includes all races).
 Asian / Pacific Islander.
 Native American.
 Mixed Ethnicity (Bi- or Multi-racial).
 I choose not to identify.
 Other (Please specify): _____

For the following questions, please describe your use of library and information resources to the best of your knowledge.

1. How many times have you had a class session or research appointment with a librarian since you started FAU?
- None.
 One time.
 Two or more times.
2. I learned about the FAU Libraries' information sources by the following ways (select more than one if it applies to you):
- A University or library announcement (examples: flyer, web page, or other type of advertisement).
 A campus tour or an orientation.
 A class session or appointment with a librarian.
 A professor, teaching assistant, instructor, tutor, or adviser.
 My classmate or friend.
 Searching the internet.
 Other (Fill in your answer): _____

3. I feel confident with using information sources provided by the library (examples: finding books and articles, or using any of the library's collections).
- Strongly disagree.
 Disagree.
 Neither agree nor disagree.
 Agree.
 Strongly agree.

4. I used the library or the library's website to get to these publications (print or electronic based) to help me do assignments within the past year (select more than one if it applies to you):
- Encyclopedias, manuals, handbooks, or dictionaries.
 - Books within my subject area or in a related subject.
 - Newspapers or magazines that do not have research articles (examples: *New York Times*, *Sun Sentinel*, or *Mechanical Engineering*).
 - Research articles in a professional journal (examples: *Geoscience Letters*, *Journal of the American Chemical Society*, or *Physical Review Letters*).
 - Reports, research, or documents by the government (example: a National Institutes of Health report).
 - Industry standards (example: ASTM Standards).
 - I did not use any of these publications.
5. I used the library or the library's website to get to these electronic based information sources to help me do assignments within the past year (select more than one if it applies to you):
- Google Scholar.
 - SearchWiSE (a search engine on the FAU Libraries homepage for searching across a variety of information resources accessible through the FAU Libraries).
 - General library databases (examples: Academic Search Premier, ProQuest).
 - Databases that focus on a subject area (examples: IEEE Xplore, GeoBASE, SciFinder, MathSciNet).
 - Web of Science.
 - RefWorks.
 - Streaming videos.
 - Electronic books (eBooks).
 - I did not use any of these information sources.
6. I used these information sources to help me do assignments within the past year (select more than one if it applies to you):
- Internet search engines (examples: Google, Bing, or Yahoo).
 - Websites other than the FAU Libraries.
 - Wikipedia.
 - EndNote, Mendeley, or another kind of citation software other than RefWorks.
 - I did not use any of these information sources.
7. I know where to find books, journal articles, and other information sources in the library.
- Strongly disagree.
 - Disagree.
 - Neither agree nor disagree.
 - Agree.
 - Strongly agree.
8. I currently use the library's information sources from off-campus:
- Never.
 - Less than 1 hour each week.
 - 1 – 2 hours each week.
 - 3 – 5 hours each week.
 - 6 – 11 hours each week.

_____ 12 or more hours each week.

9. I currently visit the library to study or do work:

- _____ Never.
- _____ Less than 1 hour each week.
- _____ 1 – 2 hours each week.
- _____ 3 – 5 hours each week.
- _____ 6 – 11 hours each week.
- _____ 12 or more hours each week.

10. I am satisfied with the service and assistance I get from the library.

- _____ Strongly disagree.
- _____ Disagree.
- _____ Neither agree nor disagree.
- _____ Agree.
- _____ Strongly agree.

11. I am satisfied with the information sources I get from the library.

- _____ Strongly disagree.
- _____ Disagree.
- _____ Neither agree nor disagree.
- _____ Agree.
- _____ Strongly agree.

12. I am satisfied with the library building.

- _____ Strongly disagree.
- _____ Disagree.
- _____ Neither agree nor disagree.
- _____ Agree.
- _____ Strongly agree.

13. I am satisfied with the library's study spaces.

- _____ Strongly disagree.
- _____ Disagree.
- _____ Neither agree nor disagree.
- _____ Agree.
- _____ Strongly agree.

14. I am satisfied with the library's technology.

- _____ Strongly disagree.
- _____ Disagree.
- _____ Neither agree nor disagree.
- _____ Agree.
- _____ Strongly agree.

15. Please share your thoughts or opinions about how the library can improve its services, information sources, and facilities for science, technology, engineering, and math students.

Thank you for your participation and helping the FAU Libraries enhance its services!

Appendix II: Comments to Open-Ended Questions

The following comments have been categorized for the survey's open-ended questions.

2. I learned about the FAU Libraries' information sources by the following ways (select more than one if it applies to you):
- I never heard of it (5 comments).
 - On my own (3 comments).
 - Walk-in (2 comments).
 - Asked for help (2 comments).
 - Email (1 comment).
 - Owl App Map (1 comment).
15. Please share your thoughts or opinions about how the library can improve its services, information sources, and facilities for science, technology, engineering, and math students.

Building and Facilities:

Building:

1. Building needs to be destroyed and built back modernly.
2. Make a new building. This one is old, get more study rooms.
3. It is my opinion that each of the library's floors needs to be completely updated.
4. The whole building should have the same feel throughout.
5. Build a new one. FAU needs 2 on the Boca campus.
6. Build another library because proportion of FAU students that use Wimberly to how much study space there is available does not match.
7. Possibly a second, smaller library geared toward FAU's large body of pre-medical and science students.
8. The only real improvement that the library can have is to remodel.
9. It is a very old building.
10. Our library could use a sweeping physical revamp. Visit any other university's library (especially neighbors NSU or even FIU)... FAU's library pales in comparison and looks/feels extremely dated as well.
11. Have a new building.
12. The building.
13. Library should be renewed.

Facilities:

1. Lighting should be upgraded to brighter led lights since many places in the library are dark.
2. Better maintenance and updates of things in there.
3. Lower AC on 2nd floor.
4. The restrooms in the library.
5. The walls in the study rooms need to be repainted and needs to be a bigger emphasis on not drawing on the walls.
6. Colder A/C top floor.
7. The AC vents are full of dust and mold.
8. Starting from the top story, sectionally "gut" the floor and renovate the carpeting, walls, and ceiling.
9. Lockers in the library for students to store their stuff.
10. Make room 214 B a designated video game computer lab.
11. Better WiFi bandwidth & coverage especially near borders inside of building.
12. There needs to be more Internet routers in different parts of the library because the center of the library has the best wifi, but the ends have horrible wifi.
13. The printer coin machines are down too often.
14. Fix the air conditioning on the upper floors.
15. The library is spooky. The bathroom, aside from the gender neutral ones are scary.
16. The carpets and ceiling and furnishings are moldy and dank feeling.
17. More physical mini-labs that are more "hands on" to those in science majors.

18. Needs a better printing system.
19. Add a napping area.

Power Outlets:

1. Need power outlet strips added to study cubical on 3rd and 4th floors. Impossible to study with a laptop for long periods of time when there is nowhere to plug a charger into.
2. More plugs (outlets) for charging devices.
3. It would be helpful if more outlets were installed in the study areas.
4. Please add more electrical outlets in common study areas for charging laptops, etc...
5. I feel the library study rooms could be cleaner as well as more outlets for electronics.
6. More outlets and spaces to sit.
7. There should be more outlets conveniently placed throughout the building.
8. I think there should be electric outputs in every table at the library, in fact is really hard to study there because is hard to find a table near an electric output.
9. One of the biggest challenges I face when studying at the library is finding outlets to plug in my lap top.
10. Increase the plug sites for students charging their computers.
11. We need more outlets.
12. Outlets to plug in laptops in study areas.
13. Also I think there should be more outlets for students to charge their electronics.
14. Increase the power outlet because most of the time i use laptop and I need power outlets.
15. The electric outlets are so limited.
16. The library can improve by installing more and better outlets to plug in laptops, especially on the fourth floor.
17. There are not enough electrical outlets, especially on the second and third floor study spaces.
18. Greater friendliness for student laptop charging.
19. Outlets on all of the tables would be astronomically beneficial to everybody who uses those tables.
20. We need more space to study. With charging stations in those spaces
21. More electrical outlets and cubicles
22. Outlets should work!
23. More desk space and electrical outlets.
24. Study desks need outlets to plug in laptops.
25. There should be up to date study areas that have power outlets for computers.
26. More sorts of plugs in more places.
27. Please create more electrical plugs since almost every student has a laptop and phone, etc... And maintain the old plugs because they are not safe or tight enough to hold electrical cords.
28. More outlets near tables/cubbies to plug in personal laptops for research/studying.
29. By adding more study space (quiet zone) and more electrical outlets by said study spaces.
30. Need more study areas with power outlets for laptop usage.
31. Better and more outlets.

Furniture:

1. Furniture and flooring are old, worn, and smelly.
2. Bring more inviting cubicles/pods.
3. FAU should also get rid of the 20+ year old desks and tables on the 2nd and above library floors and replace it with something more practical and modern.
4. The furniture needs to be replaced because a lot of the chairs look old/torn or falling apart. The chairs also smell very dirty.
5. Replace the 1970's cubicle desks (made for elementary students) with more modern frames that are fitting for adults that intend on spending hours working.
6. Replace the wooden chairs meant for again ~ elementary students ~ with ergonomically designed chairs meant for hours of sitting,
7. The chairs are also dated and need updating on that area as well.
8. The new furniture doesn't match because the surrounding structures are so depressing and dreary and dirty.
9. Some new desks would be nice.
10. Need more desks on 2nd and 3rd floor.
11. Update the individual study areas with the desks.

Cleanliness:

1. I feel the library study rooms could be cleaner as well as more outlets for electronics.

2. Clean up the study rooms.
3. There needs to be more tables open and also cleaner set up of cubicles, tables, etc.
4. Study rooms can be very dirty.
5. The study rooms are absolutely disgusting!!! Same dirt and garbage for the entire month! I guess since the rooms are locked the janitorial staff does not come in.
6. At least I can be provided a disinfecting wipe to wipe down the tables of the study rooms.
7. It smells like rotten feet in all the study rooms.
8. Cleaner study space, there's graffiti and gum and trash.
9. Cleanliness needs improvement.

Study Spaces & Study Rooms

Study Spaces:

1. There is limited areas where students can quietly work. There should be more spaces.
2. Renovation of the general study areas.
3. More study areas.
4. More outlets and spaces to sit.
5. I like the renovation they did on the top floor to offer more study space.
6. In fact is really hard to study because is hard to find a table near an electric output.
7. FAU should upgrade all study tables in the library to ones that have power outlets nearby.
8. I feel like the library doesn't provide enough big tables and open space.
9. Increase the chairs.
10. There needs to be more tables open and also cleaner set up of cubicles, tables, etc.
11. I wish there was more study space.
12. Outlets to plug in laptops in study areas.
13. I think there should be more booths on different floor, such as the 2nd and 3rd floor.
14. The first floor set up took away a lot of places to sit.
15. Maybe the usage of signage can be improved and more visible for others to see that it's a QUIET zone.
16. There needs to be more tables in the lobby to do work on or group seating.
17. Not enough space for students studying in quiet zones.
18. Improve the space by adding more.
19. I really do enjoy studying at the library, especially with the new study areas and computer area.
20. The quiet areas on third floor are not really quiet, other students seem like do not know or see the signs for Quiet area. And the noise from the group study on second floor are so loud.
21. More study areas.
22. I am very grateful for the graduate student lounge. However, I am not sure if this is considered quiet study or not. I saw signs that say it is, but inside groups of student will come into the room with the sofas and spend their first 45 minutes gossiping/whining/just overall socializing before they actually begin to conduct group study sessions. Maybe if the signs were posted in each room to say which room is quiet study etc. this would help.
23. There are not enough electrical outlets, especially on the second and third floor study spaces.
24. More areas for students to study in.
25. More private study rooms for groups and whiteboards in those rooms.
26. It could also use more independent and group (conversation friendly) study areas.
27. Outlets on all of the tables would be astronomically beneficial to everybody who uses those tables.
28. More study spaces that are for groups of 3+.
29. We need more space to study.
30. Students should not have to sit on the floor amongst the stacks.
31. More electrical outlets and cubicles.
32. The library needs more seating and areas for group work (not in study rooms).
33. Better study rooms/ areas.
34. More study spaces that are quiet.
35. More desk space and electrical outlets.
36. Study desks need outlets to plug in laptops.
37. More quiet areas are needed.
38. It never seems that there are enough areas for students to study. Many times groups of students are using the floors to work because seating space is non existent.
39. Need more quiet zones.
40. I only go to study.
41. There should be up to date study areas that have power outlets for computers.

42. Add more study areas,
43. Need more desks on 2nd and 3rd floor.
44. Create better study rooms with more space.
45. Study spaces need to be larger.
46. And more study spaces and rooms.
47. Get better study rooms and cubes.
48. More study areas for group study.
49. More study spaces that are quiet could also help.
50. More outlets near tables/cubbies to plug in personal laptops for research/studying.
51. By adding more study space (quiet zone) and more electrical outlets by said study spaces.
52. Need more study areas with power outlets for laptop usage.
53. More private study spaces.
54. More study spaces and a quieter environment would be appreciated.
55. More study space.
56. Update the individual study areas with the desks.
57. More study space and quieter study space
58. Please emphasize and enforce the quiet study spaces in the library.
59. We need quieter rooms and more computers.
60. Expand in some way, shape, or form that would allow somebody to be relatively alone. A place where they feel safely content with seclusion.
61. The library also does not allow me to use the study rooms alone
62. Individual desks please.

Study Rooms:

1. Get more study rooms
2. Nicer study rooms... a bit outdated.
3. More QUIET study areas.
4. The study rooms are too hot, small and very cramped.
5. I feel the library study rooms could be cleaner as well as more outlets for electronics.
6. Sometimes the group rooms upstairs tend to be inconsistent with the temperature which can make it tough to study.
7. Bigger rooms and longer times for the study rooms.
8. WE need quieter rooms and more computers.
9. Clean up the study rooms.
10. More study rooms and better ones too
11. There are not enough study rooms and most of them are way too small for group studying (projects, etc).
12. Study rooms can be very dirty.
13. The walls in the study rooms need to be repainted and needs to be a bigger emphasis on not drawing on the walls.
14. More study rooms.
15. More private study rooms for groups and whiteboards in those rooms.
16. More study rooms would be beneficial.
17. They could also improve by possibly slightly extending the study rooms.
18. More study rooms, and make them larger.
19. Better study rooms/ areas.
20. More group study rooms are needed.
21. The study rooms are tiny boxes.
22. Create better study rooms with more space.
23. The whiteboards in study rooms need to be replaced.
24. More study spaces and rooms.
25. Get better study rooms and cubes.
26. The study rooms in the library should be a little more bigger and have technology in them.

Noise:

1. People could be quieter in study zones.
2. Keeping the quiet floors more quiet
3. Have stricter quiet areas. There are plenty of times I was studying on the 4th floor silent zone and people were having full on conversations. If it isn't too difficult I would suggest a quick text option to report the loud patron to the proper authorities.
4. Better monitor noise levels on upper floors

5. The library can improve its services by enforcing rules such as silent zones etc..
6. Perhaps by ensuring that designated study areas remain quiet.
7. Quiet study zones should be monitored more frequently because they can get VERY loud.
8. My only and main concern is how all the floors are extremely loud. All the floors marked as quiet floors are filled with groups of people being extremely loud and disrespectful to the other students. I'm sure a lot of STEM would agree since most of them study in the third and fourth since they're suppose to be known and labeled as the quiet zones but clearly aren't. I've told the staff multiple of times about situations like this and nothing is done so I'm required to either move to another area that's just as loud or simply leave the library.
9. Maybe the usage of signage can be improved and more visible for others to see that it's a QUIET zone.
10. There needs to be stricter regulations on the amount of noise in the library because even though the lobby is the loudest floor, there are still people who find the need to talk as loud as they can while others are trying to study.
11. Also, when in quiet zones, kids are loud but nobody says anything about it, so essentially there are no quiet zones to study in.
12. Enforce the quiet areas.
13. The quiet areas on third floor are not really quiet, other students seem like do not know or see the signs for Quiet area. And the noise from the group study on second floor are so loud.
14. Too noisy to get any work done.
15. I have always gone to the library as a place to study, however with new additions to study areas (which are great and very well used properly during exams) there is an increase in social hour at the library. I specifically go to "quiet" study areas in hopes that there will be minimal distractions and anywhere that students can meet to study together, not solo in a cubical, there are people who meet to socialize. For example I spent over 4 hours on Monday on the 3rd floor just outside of the elevators (in a quiet study area, I checked for the sign) and there was a table with people who were coming and going but never less than 6 who thought it was a nice place to meet to hold casual, loud conversation. I would like to see the quiet area's being enforced so that I can continue to have other students join me to study without having to find a cubical to study alone. Maybe if there were an employee who occasionally walked around to remind people to be respectful of the quiet areas so that students who need the lack of distraction stay and continue to use these area's.
16. The quiet study areas are used by people who eat lunch, talk on the phone and have loud conversations. Posted quiet zones are not enforced by the staff. Students that require quiet study areas are forced to search out vacant classrooms in various other buildings around campus. I remember a time when a library was a place where you kept quiet. The FAU library is not such a place.
17. Security needs to patrol quiet areas and remove noisy people
18. The library is too loud to study.
19. It has been too noisy as of late.
20. There needs to be quieter places to study. If it isn't too difficult I would suggest a quick text option to report the loud patron to the proper authorities.
21. The library can improve its services by enforcing rules such as silent zones etc..
22. Perhaps by ensuring that designated study areas remain quiet
23. Also quiet study zones should be monitored more frequently because they can get VERY loud.
24. Enforce the quiet areas
25. Posted quiet zones are not enforced by the staff.

Computers

Computers – General:

1. Have more computers available like the ones downstairs.
2. Include HDMI connector to screens (no one uses VGA).
3. Offer more rentals from the tech hub such as cameras and headphones
4. I also wish there were more updated Mac hardware and that computers were updated more frequently.
5. I feel like there are not enough computers sometimes on the first floor.
6. There needs to be more computers for everyone to access.
7. I love that we are able to check out markers, ipads, laptops, etc.
8. Being able to take the laptops that we rent outside of the library would be helpful.
9. The sources and technology they have to offer is great for the students.
10. Even though the computers are old, they are still very good.
11. On the computers, can the setting for the volume be lower when the computer gets logged into or turned on?
12. I really do enjoy studying at the library, especially with the new study areas and computer area.
13. Improved computers.
14. Make room 214 B a designated video game computer lab.

15. More computers.
16. Stronger internet connection.
17. Better (faster) computers and connection to UM computers.
18. Kick people playing games off computers.
19. The older 4:3 TFT screen monitors are not large enough or bright enough.
20. Offer more computers on the 1st floor.
21. Knowledge base of equipment at the library, including printers.
22. The study rooms in the library should be a little more bigger and have technology in them.
23. The library services could improve by having more computers and space since often times a lot of them are taken.
24. More computers to compensate for how crowded the library can get.
25. Make more computers available to work on assignments.

Computers – Science Apps:

1. There are some programs that are difficult to get access to outside the science computer labs, if a designated computer had applications like Origin or Gaussview that would be helpful.
2. A 3D printer (capable of printing medium to large sized prints) that can be used by engineering students for general use (such as modeling and prototyping ideas) and not necessarily for class would be appreciated.
3. Better computers for engineering students, and access to plotters for civil engineering plans.
4. The library should allow students to be able to connect to vmware through the library computers.
5. More accessible classroom setting computer spaces with auto cad programs. The engineers have no place to study.
6. The computers should have access to the software programs needed for engineering students ie Solidworks, CADD, Arduino etc. These programs can only be accessed from inside the Engineering buildings.
7. The old AutoCAD lab should be opened to all engineering students. We pay tuition and should be allowed to use a room that no one uses and not be harassed about using it when no one is on there.
8. If the computers have some software that we can use, that'd be great.
9. The computers need access to VMWare for engineering students.
10. Please add VMWare program to computers.
11. Please add VMWare program to computers. Necessary tool for engineering classes that other computers on campus have already.
12. As engineers, having access to VMWare on any computer I want to use would be nice.
13. Put VMWare on all of the computers for us Engineers!

Library Programs & Services:

Materials:

1. Offer select print journals such as Nature Protocols, JACS and other high impact publications.
2. More books on coding/programming.
3. I wish that the library had more updated books in science.
4. More databases will be nice.
5. The sources and technology they have to offer is great for the students.
6. Although I have used the physical building of the library very little
7. I use GoogleScholar regularly from my office computer in the math department, but the question above asked if I access this site through the Library website. Are students supposed to do this?
8. While it is still important to maintain physical books (as I acknowledge that physical publications do still have a place in the modern world), the library needs to further adjust to the changes in how students are using university libraries today: not for quite for physical publications, but for gathering, studying, and using electronic resources.
9. Increase the size of your library on theology.
10. The library is located prohibitively far from the central hub of electrical and computer engineering and computer science (engineering east). As a result, while I like to check the library for books, it's far more convenient for me to go to a professor or to the engineering library where our professors store books on the 5th floor of engineering east. Professors will occasionally recommend books from the FAU library that are either not in stock or are not available (I.E. I recently wanted a book but all 3 copies are reported missing).
11. More whiteboard space.
12. Include more solution manuals for books.
13. Searchwise could be more user friendly and relevant. Too many irrelevant sources and links seem confusing.
14. The whiteboards in study rooms need to be replaced.

Outreach and Orientations:

1. Getting the word out about the options available.
2. Better notification of events/services through mediums such as email, displays in lobby, etc.
3. Little more broadcasting of services. Never knew about any of this until Chemical Literature course.
4. Make sure to give a tour on how to use everything to every incoming transfer student.
5. Give more information of what's available to students.
6. Advertise the library and its resources more often.
7. More library tours and tutorials during the freshmen and sophomore year so that by junior and senior year, we're more comfortable with library resources.
8. I think the library could make more of an effort to inform students about different resources available to them.
9. I also believe that during orientations for new students the library should be explained and shown from finding a book to checking one out to doing a research article and using the databases
10. Make sure to give a tour on how to use everything to every incoming transfer student.
11. Host tutoring sessions at the library.
12. Currently, there aren't any engineering workshops which would be helpful to current students she can also act as a recruiting tool for the engineering department. It will give current students more hands-on opportunities to build devices and contraptions as well as coding. People not associated with the school can take these workshops (for a fee, but free for current FAU students) as well, which would increase the likelihood of interest in attending FAU and interest in engineering. Some examples of workshops could include creating rc cars, circuits, etc.
13. It would be helpful to have someone show us how to use the library's website for doing research Ex: explain what the difference is between database and catalog.
14. I think the library could make more of an effort to inform students about different resources available to them.
15. I would think doing things like blind date with a book for pleasure reading may reduce stress in students.

Food and Beverages:

1. Microwave for heating food when studying @ library.
2. Food sources would improve library function. Also free food giveaways to studying students. We LOVE food, especially while studying and with all the money we pay for tuition to go here you would think we would be getting free food giveaways like they do at the Davie campus every day.
3. Have vending machines on each floor stocked with healthy alternatives to the current sugary pickup ~ crash ~ repeat candy (again from the 70's). Have vending machines on each floor stocked with healthy alternative drinks.
4. Replace Dunkin Donuts (REALLY?!) with again ~ a healthier alternative (maybe Starbucks?).
5. Larger Dunkin Donuts
6. Provide a second coffee shop!
7. Offer incentives to study at the library (snacks).

Comments and Suggestions:

1. Steal money from the Football department and then use your best judgement.
2. FAU is growing, therefore so should the library too...
3. I find the 24 hour center more helpful to study at.
4. I hope the opening of the 5th won't be another socializing floor.
5. More motivational art or posters.
6. Friendlier staff.
7. Also parking but we both know that's not going to change.
8. Focus more funds on the library rather than the football program. ;)
9. Staff.
10. Lower your late fees on ipad rentals.
11. I almost never use the library. It's complicated. I rather find stuff on my own.
12. Bring blue/green scantrons back!
13. More search-friendly.
14. The only thing that I would change would be the security and safety for the students, faculty and staff.
15. I work during normal library weekend hours; I'd really love to see extended hours on Friday and Saturday (or maybe at least during popular exam periods), as that would help make the library more accessible to commuter students/students with full-time jobs.
16. Stay open longer.

I do not go to or use the library very much:

1. Because the Jupiter campus is closer to home, I go there to study. The staff is incredibly friendly and helpful, so I feel very comfortable there. Even though I attend classes at the Boca Raton campus, I have actually never stepped foot inside of the library there.
2. I work full time as well as attending FAU, so it's more that I just don't have the time to utilize any extra resources that FAU offers.
3. I've never been to the library or used any of their resources.
4. More private study rooms for groups and whiteboards in those rooms. That's the only reason I don't use the library.
5. I never use the library because it's not a library but rather a social gathering place.
6. I am a new student here and I haven't had the chance to really use every resource the library has to offer.
7. I am a transfer student and just started FAU, so I did not get a chance to go to the library, but I will go in the future.
8. I haven't visited the library more than one time yet.
9. I have not had much exposure to what the library has to offer, especially the online databases.
10. I almost never use the library. It's complicated. I rather find stuff on my own. I only use library 2 or 3 times to borrow laptops.

Positive Feedback:

1. Because the Jupiter campus is closer to home, I go there to study. The staff is incredibly friendly and helpful, so I feel very comfortable there
2. It's lit!!
3. Great library.
4. I like the renovation they did on the top floor to offer more study space.
5. I love that we are able to check out markers, ipads, laptops, etc.
6. Keep up the good work!
7. The sources and technology they have to offer is great for the students.
8. The staff is helpful as well.
9. The staff are nice/
10. I really do enjoy studying at the library, especially with the new study areas and computer area.
11. I love the library though, it's helped me with so much studying, I really appreciate all that the staff does!
12. I really appreciate all that the staff does!
13. I am very grateful for the graduate student lounge.
14. The service was great
15. Otherwise, great space.
16. I believe the library is already great.
17. The library overall is well versed and adequate for my needs.
18. The FAU Library is an excellent library and resource.
19. I think that's a good service.
20. I've always had great experiences with the library and its employees.
21. Everything's fine so far.