A Research and Class Model for Future Library Instruction in Higher Education

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Introduction

At Florida State University a unique freshman seminar has been established that brings together university librarians, criminology faculty, and reading writing center tutors to offer a library intensive class combining library instruction with the requirement of a 15 page research term paper on topics chosen by students with instructor approval. This pedagogic innovation has been developed in conjunction with a methodologically rigorous quasi-experimental research model to measure its effectiveness. The seminar is based on the hypothesis that using the library as the principal venue for helping students learn to write, reason, and research by producing a first-class research paper early in the college experience will positively impact a student’s future grades, help them remain at the university and graduate at higher rates than a control group of students who do not have this experience. To test this hypothesis, a mixed-methods longitudinal study, commenced in 2010, comparing a precision matched comparison group with the experimental group of students who participate in the seminar. Another element of the research utilizes an end of semester survey to measure the impact of the class on each student.

Participating in a library based instruction and research team can empower university librarians to become direct pedagogues teaching library and information management skills by collaborating with faculty to help students write major research papers in a seminar setting. The collaboration enhances student learning outcomes, provides cross-pollination and professional development across disciplinary boundaries for faculty and librarians, and integrates the university library more fully into the educational mission of the larger institution. For all these reasons the library-based freshman research/writing seminar is a useful strategic model for university libraries to consider.

Current library instruction research

Past efforts to measure library instruction have been based on “student perceptions of instruction or on isolated skills improvement in the form of pre-and post-testing in relation to library instruction” (Wong & Cmor, 2011, p. 464). “In many cases data exists that links libraries to retention and graduation rates, but these correlations are not easily investigated” (Oakleaf, 2010, p. 14). In recent years the higher education assessment movement has grown more rigorous (Pausch & Popp, n.d.), and published research in the field of library instruction increasingly includes studies with sophisticated methods and larger sample sizes examining the longitudinal effects of library instruction on GPA.

Wong & Cmor (2011) using a sample of over 8000 students at Hong Kong Baptist University utilized quantitative measures of library instruction’s long-term effect on students’ overall grades. Multiple instructional experiences were associated with higher grades. Their “results indicate that library instruction has a direct correlation with student performance, but only if a certain minimum amount of instruction is provided” (Wong & Cmor, p. 464). Similarly, Bowles-Terry (2012) examined over 4400 transcripts of students about to complete their bachelors’ degrees and found that library instruction taught in upper-level, discipline-specific courses correlates with higher grade point averages (GPA). Cook (2014) found that information literacy/library instruction courses taught over a 12 year period led to higher student GPAs compared to a control group matched on academic preparation variables such as ACT/SAT scores, but who did not take the course. None of these studies have controlled for other variables such as race, socioeconomic status, or gender.

In this regard Selegean, Thomas, and Richman (1983) appear to be ahead of their time. They conducted a study that controlled for multiple variables that affect student success. Their research directly compared students in their library course against students without the course who had similar majors, grade levels, and SAT scores (p. 478). Emmons & Wilkinson (2011) also controlled for race, ethnicity and gender in their study of library impact on student persistence because they were aware of studies that found that race/ethnicity and SES had a significant impact on student persistence in college” (p.131); by controlling for these variables they discovered that the “ratio of library professional staff to students” is positively related to graduate rates and persistence (p. 128).

Hook (2012) reviews the library instruction research and practice from 2009-2011 and points out that research during that time focuses on three topics: impacts on learning, collaborations with faculty, and perceptions
of information literacy among faculty and students (p. 7). She argues that researchers in the United States need to examine research undertaken internationally (p. 8). Creaser & Spezi (2012) examined eight case studies from Scandinavia, the United Kingdom and the United States and concluded that “embedded information literacy instruction” is often presented in “ad-hoc sessions” and that librarians should strive to integrate the teaching of information literacy skills into “specific programmes or courses” (p.5).

An Experimental Seminar is Born

 Measuring the connection between student success outcomes and library instruction in partnership with teaching faculty is evolving and expanding in order to demonstrate university library value (Gilchrist & Oakleaf, 2012). During the past four years, Florida State University Libraries (FSUL) has been involved in a unique and dynamic model for library instruction and longitudinal research outcomes in collaboration with the Florida State College of Criminology and Criminal Justice and the campus Reading Writing Center (RWC).

In this partnership, librarians and a criminology faculty member, co-teach a college freshman seminar in the library. Students are required to write well-crafted and carefully referenced 15-page research papers. Library research skills are taught and demonstrated throughout the semester in the main library instruction lab, but mostly students are working on their projects with faculty librarians and graduate students moving around the room working with students individually on how to find the information they need and how to assess and utilize it. In the process it is expected that students will enhance their critical thinking, research, writing and reasoning skills they can use throughout their college career and beyond.

Our research aims to test whether this model of faculty/librarian co-instruction in a seminar aimed at producing research term papers enhances student success in the long term. The study seeks to fill the gap in library research and to demonstrate the libraries’ value to the institution and its disciplines (Oakleaf, 2010) by measuring whether library instruction integrated into collaborative disciplinary seminars impacts retention, graduation rates and grade point averages (Association for College & Research Libraries [ACRL] Research Planning and Review Committee, 2012; Florida Board of Governors, 2014; Florida Legislature, 2014). Libraries need to be “strategically” and “externally” focused when choosing “measures to use as evidence of how the library affects educational outcomes” (Gratch-Lindauer, 1998, p.546). The focus on measuring the impact of library instruction using quantitative measures is aligned with increasingly important university and governmental accountability measures (Gratch-Lindauer, 1998).

Partners in Teaching and Active Learning

 Students begin their experience in the main library on FSU campus with a tour of the space and an introduction to library services. Then for seven weeks during the semester the seminar constitutes a sort of workshop in the library computer lab to foster an integrated approach to the research and writing process (Gardner & White-Farnham 2013, p. 235). The library “studio research lab” classes begin with librarians giving brief tutorials (lasting roughly 20 minutes) on the research process (how to evaluate web sites) and includes demonstrations of research databases (i.e. Academic Search Complete), tools (citation management software), and skills (use of Boolean operators, wildcards, keywords, etc.) over the course of the semester. Students are then asked to begin using these and other online tools to search for information on their topic. In this active learning “studio” environment, the librarians, the professor, and the TA roam the room assisting students at their computer stations as needed. Students use this studio lab environment to get guided hands-on experience searching and using library resources.

This approach provides highly individualized faculty interaction with students in the classroom and grants the librarians a great deal of time over the semester to “cover all facets of information” and to demonstrate the relevance of library skills to doing good academic work. Students are expected to gather many differing points of view on their topics and to use the research they acquired to formulate arguments or prove assertions in their paper. Librarians have observed that collecting the research seems to be the easy part, but that integration of ideas seems to
be most challenging for students. Merely regurgitating their research discoveries is not enough. Students often become experts on the topics they have researched and their papers are thoroughly buttressed with empirical research, peer-reviewed articles, primary and secondary sources collected using skills acquired and practiced from in library studio sessions. Hayes-Bohanan & Spievak (2008) noted that librarians can lead students to sources, but question whether they can teach them to think. Perhaps the answer lies in collaboration: allowing the professor to teach them how to think and process information that librarians have helped them to find and assess? In our model the use the Socratic Method to engage students in dialogue (Fruedy & Fruedy, 1986, p. 245) as they write research papers by challenging their conclusions and interpretations is intended to help students establish clarity. Sometimes the research team has to steer students away from topics that are too broad or narrow. In the end, it is hoped that students who begin as non-reflective, passive learners will become fully-engaged, active thinkers taking responsibility for their own education. (Hayes-Bohanan & Spievak, 2008; Elder & Paul, 2010).

Successive Drafts

In CCJ 1005 Freshman Seminar, students are required to write two drafts of their papers during the course of the semester and then submit a final draft at the end of the semester. The first draft is focused on a thesis statement and preliminary bibliography; students are expected to demonstrate a good start in defining a topic and undertaking research. The second draft involves the integration of research findings to prove the paper’s thesis. It is intended to be as close to a full first draft as possible. The faculty member reads both of these drafts and returns them with extensive comments, criticism, edits and suggestions. Students take both drafts to a RWC tutor for feedback. The RWC is not an editing service, but teaches higher order writing skills (i.e. organization of paper content and constructing a thesis statement from a topic, etc.). Following each RWC visit students are required to meet one-on-one with the professor.

During the professor’s review of students’ drafts the process of critical thinking is modeled. Tsui (as cited by Albitz, 2007) in her evaluation of “effective pedagogy” found that “that writing assignments, particularly those that involve feedback, rewriting opportunities, and the opportunity to provide feedback to others, were of great value (p. 105).” Iterative paper drafts have been found to improve critical thinking skills. Boff and Toth (as cited in Elmborg & Hook, 2007) state that “research and writing are complementary parts of a recursive process of inquiry” as systematic, methodical questioning and inquiry are important elements of critical thinking. Students, though often tech savvy are not well prepared to judge the credibility and usefulness of sources of information, nor are they skilled at incorporating scholarship into their writing (p.148).” Iterative writing assignments have been shown to lead to measurable growth in critical thinking abilities (Albitz, 2007, p. 105).

Methods

From the outset this project has been conceptualized as action-research. The research has utilized mixed methods: a quantitative precision matching technique to measure the effectiveness of the class, as well as a student survey administered at completion of the course to measure perception of the effectiveness of the class. The survey focuses on the skills students feel they mastered and which components of the class facilitated learning. In addition, follow-up surveys are administered at yearly intervals to measure the impact of skills acquired in the seminar were helpful in other classes. Before the inception of the project, approval from the Human Subjects’ Committee Internal Review Board was given for both the precision matching study and the survey to ensure that the students’ were properly protected and that confidentiality and anonymity protocols were enforced. Without the professor present, the research assistant reviews the informed consent protocol to assure students of the anonymity of their responses and explained that participation in the entire research project is voluntary. Each student participant signs an informed consent before completing the survey. The descriptive statistics of the student responses will be presented below in the results section.

The precision (exact) matching technique compares the experimental group, those who took CCJ 1005 Freshman Seminar, with a comparison group who did not take the course. Precision (or exact) matching “controls” for a number of variables that may impact student success (Bales & Piquero, 2012). Precision matching uses a series
of characteristics or variables (ex. such as race, age, sex, GPA, SAT/ACT scores, etc.) to match individual members of the experimental group to individual members of a comparison group. As a consequence of precision matching of students differences between the experimental group and the control group can be more readily attributed to the independent variable, the Freshman Seminar. The more control variables on which groups are matched, the less likely it is that another variable is biasing the relationship, thus differences in the dependent variables can be attributed to the independent variable. According to Nagin et al. (2009, p.145; as cited in Bales & Piquero, 2012, p.74), 'exact matching' is the “surest way of accounting for a variable that may somehow be biasing results” (p.145). Furthermore, “variable-by-variable matching is the foolproof way of controlling for potentially confounding variables (p.74).”

One problem with using precision matching is known as the tyranny of dimensionality. Bales and Piquero (2011) explain that the more variables a study attempts to match, the smaller the resulting sample size because the specific characteristics needed for a match may not exist in the comparison group. This results in smaller sample size, because when no match is found for a person in the experimental group that person is dropped from the sample. The tyranny of dimensionality is also problematic for continuous variables, which may need to be converted into ranges, or categorical level variables. The tyranny of dimensionality affected this project, as evidenced by a starting sample size of 65 that quickly became a sample size of 36. Additionally, some of the continuous variables needed to be converted into ranges. Age, for example, was converted into several ranges: 17-18, 19-20, 21-22, etc.

Making ‘variable-by-variable’ matches between individuals who take CCJ 1005 Freshman Seminar, the experimental group, and individuals in the comparison group has been time consuming as each semester there are only a small number of students to add to the sample because CCJ 1005 is intentionally a small class (n=15-20) to maximize one-on-one experiences for students (Emmons & Wilkinson, 2011).

The groups were matched on many variables, beginning with basic demographic variables: race, gender, age, citizenship, residence, and class (freshman, sophomore, junior or senior). Additionally, the groups were matched on the following variables hypothesized to affect the dependent variable (next semester GPA); incoming GPA (their high school, GED or transfer GPA), incoming SAT or ACT score, whether they were an honors student, whether they were a military veteran, or whether they were in FSU’s CARE Program for students who are the first generation of their family to attend college.

One unanticipated problem was the recent change in FSU protocol, which discontinued the use of student FSUSN’s (student identifying numbers) resulting in a useless de-identified dataset because the registrar’s office would no longer be able to identify the students based on their FSUSNs. To alleviate this issue, researchers contacted the FSU Office of Institutional Research, which was able to access the needed data from a different source, while still protecting student confidentiality. Analysis of that data is on-going and only preliminary results will be presented, however analysis of survey data is further along and will be presented in its entirety.

Preliminary Results: Survey Data

The survey results presented here are based on student surveys administered to all students who took CCJ 1005 Freshman Seminar since 2010. Thus far, the results of the survey have been very encouraging, as well as, informative in transforming the class to become as helpful as possible to future students. The results presented give an overview of the skills the students felt they learned in the class, the components of the class they found most helpful, as well as, which specific databases they learned about.

Table 1: Skills learned in the class

Table 1 shows the distribution of the responses for the skills learned as a result of taking the class (CCJ 1005). This table is based on a Likert scale of measurement and both the percentages and the raw numbers are provided. While all categories are presented in Table 1, only strongly agree and agree will be discussed as the last
three categories (neutral, disagree and strongly disagree) make up such a small percentage. Results demonstrate that a large majority of the students either strongly agreed or agreed that they were able to locate books and articles both in the FSU library and the FSU library website as a result of this class; 84.06% and 92.81% respectively. Similarly, 86.33% of the students who took the survey either strongly agreed or agreed that they felt comfortable in the physical library space, finding books or getting help from a librarian as a result of this class. Lastly, 84.89% strongly agreed or agreed that because of this class, they now understand the importance of peer reviewed journals when it comes to doing thorough scholarly research.

Table 2: Library skills learned in the class

Table 2 analyzes responses to survey items about library skills students learned about during CCJ 1005 Freshman Seminar. This table is also based on a Likert scale, but all response categories will be included. It is clear from this table, that the students felt that they learned about the databases and online resources more than they learned about locating the books in the library. All but one of 139 respondents reported that they learned a great deal or “some” about databases and online resources, and more than 90% reported that they learned a great deal about locating books in the library. This is to be expected as the librarians spent the first 20 minutes of the library work sessions teaching the students about the online databases. Librarians focused most of their instruction in this course on virtual sources and less on print resources on the shelves, though the professor encouraged the use of both virtual and print resources. Together this increased exposure to lessons about online databases, as well as, the trend toward relying on electronic resources for research explains the modest discrepancy between the sets of figures in Table 2.

Table 3: Specific research skills learned in the class to broaden and narrow research

Table 3 displays the distribution of the specific research skills students believed they learned in the CCJ 1005 Freshman Seminar. The overwhelming majority believed that they gained a range of specific research skills for broadening or narrowing a search. 88.49% believed that they were able to broaden or narrow their search by using a different database. This was the largest percentage in Table 3, which again reflects the attention to database research throughout the semester. Over 85% of the students believed they were able to broaden or narrow their search by using different keywords. 76.26% responded that they learned to do so by using different ways to navigate the library web site, and over 71% believed they learned to broaden or narrow their search by using “and/or” in their search command. All of these skills involve critical thinking.

Table 4: Components of the class that improved their research skills

Table 4 displays components of the class that students felt improved their research skills. As predicted based on the results from Table 2 the database presentations by the librarians were the most successful component according to the students, with 69.23% of them asserting this improved their research skills. The next most helpful component was the intensive attention to the research progress by the CCJ 1005 team; over 64% of the students felt this component improved their research skills. The library work sessions were the next most helpful component, 59.71% of students agreed this improved their research skills. This is followed by the RWC visits, as 55.75% of them agreed this was helpful. Over 40% of them agreed that learning about RefWorks, citation management software provided by FSU, helped to improve their research skills. Interestingly, only 25.18% of the class felt that the library tour was a helpful component of the class. Many students indicated in comments that the library tour was not helpful because they had already been on a tour in another class.

Table 5: How helpful were the different components of the class

While Tables 1-4 have been more concerned with the skills students learned or the components aided in the research process, Table 5 focuses on the unique components of CCJ 1005 Freshman Seminar that helped the writing process: writing a gradual research paper, the intensive attention to drafts, and the highly accessible help. Table 5 clearly illustrates that students believed that all three of the components helped a great deal. Between 95% and 98%
of respondents felt that each of the three components of the seminar - iterative drafts, intensive attention to drafts, and highly accessible assistance – were helpful; of those, more than three quarters reported that each component helped a great deal.

Table 6: Databases the students learned to use

Table 6 provides detail about which databases or online resources students believed they learned to use through database presentations given by the librarians and practice during library work sessions. RefWorks had the highest percentage, with 87.05% of the students reporting they learned to use it during the class. This is followed by online newspapers (85.90%), JSTOR (84.17%), and LexisNexis (83.65%) closely clustered together. Both Google Scholar and Academic Source Complete are not far behind with 76.92% and 74.82% respectively reporting that they learned to use them. 61.87% of respondents reported that they learned to use Criminal Justice Abstracts.

Preliminary Results: Precision Matching

Despite the setback caused by FSU’s change away from the FSUSNs, researchers were able to analyze the first two rounds of matches before the switch. Unfortunately the sample size is very small (n=36), consisting of 18 students in the experimental group and their respective matches, therefore these results are still very preliminary and should be viewed with caution. Additionally, only one outcome variable had sufficient data to compare the matched groups: next semester GPA, or the GPA they received the semester after they completed CCJ 1005 Freshman Seminar. This outcome variable is different from the GPA used to match the groups because incoming GPA was used from another institution (either the students’ high school or college from which they transferred). For this analysis, unfortunately there were limitations on which precision matches could be used, which further reduced the sample size. All students’ from the fall 2011 experimental and comparison group were able to be included into the analysis. However, for the students’ in the spring 2012 class to be included, both the student and their matched control had to take summer classes following spring classes; therefore, some of the students from the spring semester could not be compared in this analysis because either they did not take a summer class or their match did not.

Once matches were made, a t-test was used to assess if there were any differences in the experimental and comparison groups in terms of the dependent variable, next semester GPA. As presented in Table 7, the t-test results are in the predicted direction, i.e., the students who experienced the class had a higher GPA than the comparison students. One semester after the intervention, the comparison subjects had a mean GPA of 3.06 and the experimental group had a mean GPA of 3.10. However the results are not statistically significant (p=0.54), meaning that there is 54% chance that these results are due to sampling error. Statistical significance would have been very difficult to achieve with a sample size as small as 36, but the results are in the predicted direction, which is encouraging. This project is still ongoing and each semester the sample size is increasing by 20-30 students. Furthermore, as the students’ progress through their college career and eventually graduate, it will be possible to include more outcome variables, such as: graduation rates/retention and admissions to graduate school.

Table 7: T test results of next semester GPA

Discussion and Next Steps

The preliminary results from the end-of-class surveys and the first two semesters of precision-matched pairs are positive indications that the CCJ 1005 Freshman Seminar intervention enhances students’ library research skills. Students’ indicated that the class taught them an understanding of the importance of using peer-reviewed journals in scholarly research and introduced them to sophisticated search tools for narrowing and broadening database searches. Citation management software was the most widely learned database, followed by newspapers and interdisciplinary databases such as JSTOR and LexisNexis. The database with the lowest percentage of student comfort was Criminal Justice Abstracts. It could be that the articles found in Criminal Justice Abstracts generally use advanced research and statistical methods aimed at expert readers not freshmen who are just beginning their college career. Another possibility is that the commercial interface platform for that database is not as easy to use. It is also important to note that the students reported that the RWC played a role in their learning how to conduct
research. Additionally, the students’ noted that the structure of this course created an atmosphere where students were able to access the librarians, the professor and teaching assistants throughout the semester. This “highly accessible help” was valued by the students “a great deal.” Ultimately, beyond student self-reporting surveys it will be the precision-matching comparisons that will quantitatively demonstrate if this class intervention affects student academic outcomes in the long term.

Another future direction of this study is to determine whether the collaboration and assignments in the Freshman Seminar improves students’ critical thinking skills equipping them to be more successful throughout their college career. When a campus-wide critical thinking initiative, ‘ThinkFSU’ began at the institution in 2014, the CCJ 1005 team added another component to the research, pre-test/post-test administrations of the Watson-Glaser Critical Thinking Test (Think Watson, 2014).

We will also examine the extent to which this model of research and instruction within the discipline of criminology can be adopted in other disciplines. Recently the CCJ1005 team applied for a grant to expand the program to other disciplines across campus. The grant requires sustainability of the project which includes training additional librarians to participate, as well as, continued student enrollment. To that end, the CCJ 1005 team has plans to hold workshops to train more librarians and to classify the course as a campus wide E-series course, making it an optional choice as part of a student’s liberal studies curriculum in a series of courses that focus on increasing critical thinking and reasoning skills (Florida State University, 2014).

Conclusion

“...Librarians continue to advance meaningful, campus-wide pedagogical change and are leaders in modeling partnerships across campus that desire to assess student learning outcomes in meaningful ways” (Gilchrist & Oakleaf, 2012, p. 18). Models like the experimental seminar described here, though labor intensive, benefit librarians and libraries in many ways. It provides opportunities to learn new research techniques from research faculty, to teach alongside faculty, and finally, affords them the opportunity to get to know students in a class all semester long. The active learning experience in the studio environment exposes librarians to online difficulties that students experience, and makes it possible to observe students as they go through the processes of searching, research and writing. Librarians can look at iterative student drafts of papers to determine what sources are still needed to help bolster the students’ arguments, educate students on the perils of plagiarism, and give citation help. It is through projects such as this that librarians are given a chance to make a difference in student outcomes, work collaboratively with different disciplines, and participate in high quality research.

References


Maier-Katkin, Daniel. *CCJ 1005 Freshman Seminar 2014* [Class syllabus]. College of Criminology and Criminal Justice, Florida State University, Tallahassee, FL.

Maier-Katkin, D., Gerstenblitt, M. & Riley, R. (2014), *The first-year curriculum at America's elite universities*, unpublished manuscript, Florida State University, Tallahassee, FL, USA.


