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Research Article

The Relationship Between Student Demographics and Student Engagement with Online Library Instruction Modules

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Abstract

Objective – To investigate whether there are any demographic trends affecting student engagement with online library instruction which might have implications for practice, the authors designed a case study to examine the relationship between student demographic

characteristics and engagement with online library instruction modules in English 102 courses at a single university.

Methods – The authors recruited 181 students from English 102 (ENG 102), a research-based composition course, to participate in the study. ENG 102 instructors asked all participants to complete an online library instruction module embedded in the university’s course management system, either before in-person library instruction or in lieu of face-to-face library instruction. No external incentive was provided for online module completion. The research team measured levels of student engagement by recording the amount of time students spent on each page of the online module. In collaboration with the Office of Institutional Research, the authors then pulled demographic data on each participant using the university’s student information system. Pearson chi-square tests were performed to determine whether there were any notable associations between levels of student engagement and student age, grade point average, gender, and race/ethnicity.

Results – Observable trends tied age and higher grade point average to higher levels of engagement with online instruction. There was additionally a slight trend linking female participants to higher levels of engagement than their male peers. In the category of race/ethnicity, the two largest subgroups, Hispanic and Caucasian students, exhibited similar levels of engagement.

Conclusions – The authors conclude that there may be demographic implications for practice in designing online library instruction programs, especially when considering student age and academic performance indicators. They also conclude that, owing to this case study’s limited sample size, further study is warranted to investigate these conclusions, and to further examine the possible impact of gender and race/ethnicity on engagement with online library instruction modules.

Introduction

Today’s librarians are educators, advocating for the integration of information literacy into the college curriculum through embedded librarianship, collaborations on curriculum design, and co-teaching opportunities. However, in reality many librarians must continue to deliver traditional one-shot sessions and make the most of limited opportunities to engage directly with students in the classroom. This is driven largely by their partners in the teaching faculty who, contending with the demands of their content-packed syllabi, often feel that they must limit the amount of classroom time devoted to library instruction. In this environment, faculty and librarians alike are considering hybrid and fully online models as

attractive methods to enrich or even replace face-to-face information literacy instruction.

The research team worked at Northeastern Illinois University, a four-year master’s level public Hispanic-Serving Institution (HSI) in the Midwestern United States. HSIs, by definition, have a student body comprised of at least 25% Hispanic students at the undergraduate or graduate level, or both (Hispanic Association of Colleges & Universities, n.d.). The team became interested in this research after their library received a significant internal grant to develop a set of professional-quality animated videos for information literacy. This raised the question of how best to incorporate videos into the existing instructional program. The authors of this paper were accepted into the Assessment in Action

program of the Association of College and Research Libraries, which provided peer-to-peer support and professional development to design a study that examined the potential effects of the new videos on student engagement, success, and completion.

The natural partners for this investigation were instructors of English 102: Composition II (ENG 102), a research-based writing course delivered to undergraduates. The department of English requires all sections of ENG 102 to visit the library at least once to receive a standardized lesson in searching library databases. Although many composition instructors prefer traditional face-to-face library instruction, a set of instructors expressed interest in migrating to a mixed or even fully online lesson. For that reason, the research team developed three pedagogical approaches to study the effect of the videos: a hybrid “flipped classroom” model, a fully online module, and a traditional face-to-face session with no video enhancements.

The study examined the different attitudinal and cognitive effects of the three modes of instruction, as well as investigated what factors, if any, correlated with success in each format. The specific element of the broader study that will be addressed in this article is the role that demographic factors played in persistent engagement with online library instruction modules. Some students completed all assigned online modules, but most engaged only in part, or not at all. The research team sought to identify those students who were most engaged with online library instruction, and whether any demographic factor differentiated them from their less engaged peers.

Literature Review

Little scholarly research has been published on the populations served by online library instructional modules, despite the fact that academic libraries increasingly rely on these modules to address the trend in higher education towards offering more classes and

degree programs in online formats. What literature exists provides an incomplete and even contradictory picture of student engagement with online library materials. While Koochang (2004) found that male students were more likely to self-report high levels of confidence and satisfaction engaging with the online library, a very early study by Alexander and Smith (2001) showed that more women than men expressed a preference for online library instruction. Jowitt’s study in New Zealand (2008) indicated that the population of students self-selecting to use library-produced podcasts to learn library skills was largely female.

The landscape of the academic library has changed fairly dramatically since the early 2000s, however, as libraries have developed new models for resource and service delivery that increasingly extend into digital spaces. One recent study that addressed student engagement with online materials and instruction in the academic library was Soria, Fransen, and Nackerud’s research with first-year students at the University of Minnesota-Twin Cities, in which they found that student engagement with the library correlated with higher grade point average (GPA) (2013). Their measure of student engagement, however, was very broad, extending to checking out books, using library databases, and other less intensive means of engaging with the library, in addition to receiving library instruction. Therefore, the applicability of their findings to this study’s more narrow focus on student engagement with online library instruction is unclear. Bowen’s recent study of LibGuides and websites as delivery vehicles for information literacy instruction did collect some self-reported demographic data from participants. However, as the collection of demographic data was incidental to the study’s purposes and from a limited sample of participants, Bowen did not offer analysis of demographic performance or draw conclusions about engagement levels by subgroup (2014, p. 156). With few clear, recent studies addressing the demographics of library patrons using online library modules and how

those demographic groups engage with those modules, it is difficult to make any evidence-based assertions about these subjects.

For that reason, the authors conducted a review of literature on the more extensive research that has been done regarding online credit-bearing college courses. The authors were especially interested in any research that indicates whether different demographic groups are likely to be more or less engaged, persistent, and ultimately successful in the online environment. The published research on these questions has focused particularly on the demographic categories of age and gender.

Older students have generally been identified as one of the target demographic groups for online classes and degree programs. Early research suggested that older, non-traditional students were more likely to enroll in online courses (Dutton, Dutton & Perry, 2002; Halsne & Gatta, 2002). Jaggars and Xu (2010), however, found that this was true only of first-year students in their sample, and that over the course of their entire college career, students over 25 were no more likely to enroll in online courses than students under 25. The early research by Dutton et al. suggested that this tendency of older students to enroll online was driven largely by considerations of convenience, especially balancing their studies with work and family obligations (2002, p. 11). Callaway and Alflayyeh (2011) investigated these claims, and found that, while age did not seem to correlate with convenience factors, older students tended to enroll in online coursework based on perceptions of quality factors. A recent study by KunhiMohamed (2012), however, indicated that older age in students correlated slightly with both number of messages posted in their online coursework and the total time they spent accessing the course materials. This finding suggests that higher voluntary engagement might be expected of older students in similar online modules designed by the library, but delivered via the same content management system (CMS) used for online coursework.

Regarding gender as a demographic category, the literature is consistent in identifying women as more likely to enroll in online coursework and more engaged with the content of that coursework once enrolled. Research has consistently found that online students were more likely to be female than male (Halsne & Gatta, 2002; Jaggars & Xu, 2010). Early research by Marley (2007) indicated that women were significantly less likely than men to fail in their online coursework, and Marley suggested that this academic success might stem from a greater dedication of time and effort on the part of female students. Subsequent research has borne this out: KunhiMohamed (2012) found that female students were slightly more likely than males to post messages and engage with course content. Yoo and Huang (2013) found that female students reported a greater sense of intrinsic motivation in their online coursework than men did. Shen, Cho, Tsai, and Marra (2013) found that gender was a significant predictor of self-efficacy in both handling tools in a CMS and online course completion, with women having the advantage in both cases. Yukselturk (2010) examined gender in a male-dominated Turkish engineering program and found that the female students were more likely to be “active” in their course engagement than male students. On the whole, the literature sends a very consistent message that women are more likely to have the skills to engage in online coursework, the motivation to do so, and the commitment to engage in ways that improve their chances of success. As a result, the research team’s expectation was high that female students would be more engaged in voluntary online library coursework, especially when delivered via the institution’s CMS, than their male counterparts.

Given the existing body of library literature, the authors elected to design a study that would address online library instruction in a contemporary context, employing modules loaded into the university’s existing CMS, rather than podcasts as used by Jowitt (2008) or other, older forms of online content delivery. The

study was narrowly focused on engagement with online instruction itself, to see if the broader claims about library engagement in general, made by Soria et al. (2013), apply to the specific context of library pedagogy. In response to fairly extensive research on engagement in online learning by different demographic groups in higher education, the authors chose to continue that line of research into online library instruction. They hoped to determine whether these trends persist when the student is taking a brief library course, as opposed to longer, credit-bearing courses.

Aim

The authors had one principle aim for this research: to investigate whether there were any demographic trends affecting student engagement with online library instructional modules which might have implications for practice. The ultimate goal was to present a case study that would illuminate for the first time the demographic landscape of online library instruction.

Method

Context

At Northeastern Illinois University, ENG 102: Composition II is a research-based writing course with high enrollment. While not a requirement for the completion of the baccalaureate degree, it is a required course in a variety of majors, ranging from the natural sciences and social sciences to the humanities. In addition to standard library instruction requirements, standard elements of all sections of ENG 102 include learning outcomes, quantity and types of research-based writing assignments, and handbook selection. English department faculty teach all courses. Most sections of ENG 102 follow different instructor-selected course topics, and the final research assignment is most often outside of students' chosen disciplines. In Spring Semester 2014, there were 18 sections offered.

Recruitment

The English department requires certain standard elements, including learning outcomes and final research paper assignments, across all sections of ENG 102. Nevertheless, the department's culture places a high value on the freedom of individual instructors to shape the curriculum, and there is consequently variation from one section to the next in how library instruction is performed. Therefore, participant recruitment was conducted in two stages. First, the research team approached faculty assigned to teach ENG 102 sections in Spring Semester 2014 requesting permission to randomly assign their sections to one of the three pedagogical approaches: fully online, hybrid, or traditional face-to-face. Faculty support for the project was high, and therefore 14 of the 18 sections participated in the study. Every participating section was a traditionally scheduled ENG 102 class that met regularly in an assigned classroom on campus. The second phase of recruitment involved approaching students from participating sections to sign consent forms. The research team offered a modest incentive, valued under five American dollars, in exchange for students' participation. Student enrollment for flipped and online classes was 69.6%.

Modes of Instruction

The project involved three pedagogical approaches: traditional face-to-face, hybrid, and fully online. The research team designed lessons for all approaches that shared the same learning goals related to searching for and accessing journal articles in the library's largest multidisciplinary database. This article focuses solely on the online modules delivered to the hybrid and fully online sections participating in the study.

Students in both the fully online and hybrid classes received library instruction through the same online module embedded into the university's course management system, D2L. The online module consisted of seven online

pages, altogether containing four online tutorials, each under two minutes in length, short supplementary text, and three worksheets to be completed offline. The worksheets were not collected or graded. English composition instructors offered students no grade-based or additional incentives to complete the online coursework. Therefore, completion was entirely voluntary. Instructors in the hybrid classes asked students to complete the online module prior to their class's assigned work day at the library. Instructors in the fully online classes asked students to complete the online module prior to beginning research for their term paper.

Data Collection

By delivering online instruction through D2L, which requires users to log in with their unique student identification (NetID), the research team could view the exact amount of time each student spent on each page of the online course module. For reporting purposes, students who spent no time on any page of the online module were labeled as "avoiders." The research team divided students who spent any time at all in the online module into two groups: "completers" and "partial completers." To be labeled a completer, a student needed to have spent as much or more time on each page of the module as the length of time needed to watch the video content for each page. Students who fell short of that standard on one or more pages, but who spent any amount of time in the online module at all, were labeled partial completers.

The research team collaborated with their university's Office of Institutional Research to access demographic information on students. At the conclusion of the study, data were pulled from Banner, the university's enterprise resource planning system (ERP), which is used to track, organize, and store student information. The research team requested student age, gender, race/ethnicity, cumulative GPA, and student level (i.e., freshman, sophomore, junior, or senior).

Results

Student participants were predominantly female (61%), which reflects the ongoing trend in American higher education of increasing enrollment by women. The most recent data from the National Center for Education Statistics indicate that, in 2012, 56.8% of students in degree-granting secondary institutions in the United States were women (National Center for Education Statistics, 2014).

Students were predominantly 18-22 years of age. In the United States, students have historically begun college immediately after high school and completed their undergraduate work in four years, though enrollment trends are slowly changing (National Center for Education Statistics, 2015). For the purposes of this study, we labeled those students aged 18-22 as "traditional." Alternatively, students who were older at the time of this study were grouped as "non-traditional."

As with the university population as a whole, the largest segment of participants identified as Hispanic of any race, followed by Caucasian/White, Asian, and African American/Black. Since 2007, the U.S. Department of Education has required institutions of higher education to collect ethnicity and race data as two questions: ethnicity (Hispanic or Non-Hispanic) and race (at a minimum White, Black or African-American, Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander). Institutions may add other race categories if they feel they are relevant to the state or institution (U.S. Department of Education, 2008). The study institution, for instance, has added "Nonresident Alien," for reasons unclear to the research team, as a Nonresident Alien could be of any race.

Most students were freshmen in their second semester, which is when ENG 102 is typically taken. See Table 1 for descriptive statistics.

Table 1
Overall Composition of Participant Sample
(N = 181)

	n	%
Gender		
Male	70	38.7
Female	111	61.3
Age ^a		
Traditional (18-22 years)	139	76.8
Non-Traditional (23+ years)	42	23.2
Race/Ethnicity ^b		
African American/Black	8	4.4
Asian	26	14.4
Caucasian/White	51	28.2
Hawaiian Pacific	3	1.7
Hispanic of Any Race	85	48.0
Native American	1	0.6
Nonresident Alien	3	1.7
Student Level		
Freshman	107	59.1
Sophomore	58	32.0
Junior	10	5.5
Senior	6	3.3
Categorized Cumulative GPA ^c		
Less than 1.00	7	3.9
1.00 – 1.99	11	6.1
2.00 – 2.99	76	42.0
3.00 – 3.99	7	41.4
4.00	12	6.6

^aMean age = 20.97

^bCategories determined by the campus Office of Institutional Research & Assessment. Excludes 4 cases (2.2%) who did not report Race/Ethnicity.

^cMean GPA = 2.83

For the independent variables of age and cumulative GPA, analysis revealed observable trends, but no statistically significant associations. Age, a scale variable, was coded into categories prior to cross tabulation analysis using a Pearson chi-square test ($p = .129$). Student participants were categorized as either traditionally aged (18-22 years) or non-

traditionally aged (23 or older). As shown in Table 2, non-traditionally aged students were more likely to be completers (35.7%) than were traditionally aged students (20.9%). At the other end of the spectrum, traditionally aged students were more likely to be avoiders (45.3%) than were non-traditionally aged students (33.3%).

Table 2
Age Levels for Avoiders, Partial Completers, and Completers

	n (% of Age category)	
	Traditional (18-22 years)	Non-Traditional (23+ years)
Avoider	63 (45.3)	14 (33.3)
Partial Completer	47 (33.8)	13 (31.0)
Completer	29 (20.9)	15 (35.7)

Table 3
Race/Ethnicity of Avoiders, Partial Completers, and Completers

	n (% of Age category)				
	Afr. Amer./ Black	Asian	Cauc./White	Hispanic	Other
Avoiders	3 (37.5)	5 (19.2)	24 (47.0)	40 (47.1)	3 (42.9)
Partial Completer	4 (50.0)	11 (42.3)	16 (31.0)	26 (30.6)	3 (42.9)
Completer	1 (12.5)	10 (38.5)	11 (22.0)	19 (22.4)	1 (14.2)

For cumulative GPA prior to Spring Semester 2014, level of engagement increased with mean student GPA: avoiders' mean cumulative GPA entering the semester was 2.72, while partial completers' mean cumulative GPA was 2.81, and completers' mean cumulative GPA was 3.07.

Analysis by gender suggested a minor trend, but, again, no statistically significant association ($p = 0.377$). Female students were slightly more likely than male students to engage with the online library module: 27% of women were completers, compared with 20% of men, whereas 38.7% of women were avoiders, compared with 48.6% of men.

As shown in Table 3, race/ethnicity analysis did not reveal any meaningful trends. The two largest ethnic groups, Caucasians and Hispanics of any race, were almost identical in their level of engagement at every level (22% of Caucasians were completers, as were 22.4% of Hispanics; 47% of Caucasians were avoiders, as were 47.1% of Hispanics). The third largest ethnic group, Asians, did engage at a noticeably higher level (38.5% of Asians were completers, and only 19.2% were avoiders), but the small size of the group severely limits any conclusions that can be drawn from this data.

Discussion/Future Directions

The observable trend for age in the data corresponds with the trend observed by KunhiMohamed (2012), indicating that age has a small effect on engagement. Specifically, older students were more willing to spend time interacting with the online instructional module. An implication of the data is that online library modules similar to those used in the study may not be likely to reach a traditionally-aged population of first year students, as nearly half of them never accessed the module, and the vast majority of those who did access the module failed to complete it. As instructors did not attach an external incentive, such as a completion grade, to the online library module, it is possible that the use of an incentive could alter this engagement pattern. A possible conclusion from this study is that higher production values in the library videos alone may not engage younger students. Both incentives and active learning components need to be piloted in programs serving a large percentage of traditionally aged students. A library that plans to implement online instruction modules for on-campus students as a part of its larger instructional program might be most successful by using those modules in programs that serve primarily non-traditionally

aged populations, as that may yield higher levels of engagement and more effective outcomes for students.

The observable trend for GPA in the data supports the results found by Soria et al. (2013), indicating that GPA has a small effect on engagement with the library. As students' cumulative GPA rose, so too did the students' willingness to interact with the online instructional module. The authors feel that this result was perhaps the least surprising outcome in the study. Higher performing students would normally be expected to complete course assignments, including the assigned online library module, more conscientiously, even absent a specific external incentive. This trend suggests that lower performing students may be the ones most likely to be left behind in online instruction. Institutions looking to provide online library instruction should be mindful of the needs of this group in the design and implementation of online instruction modules.

The data show a very slight tendency for female students to engage more persistently than male students. This effect is consistent with the findings of multiple studies mentioned in the literature review (Marley, 2007; KunhiMohamed, 2012; Shen et al., 2013) that found this distinction between the genders in engagement with online coursework in general. That consistency implies that the small difference between the genders in this data may be more significant than the sample size would otherwise warrant, but based only on the data from this study, the authors do not conclude that there are significant implications for practice. Given the trend in the literature, institutions that have identified concerns about low academic engagement by male students might wish to proceed with some caution in relying too heavily on online library instruction modules.

A comparison of the data for the two largest ethnic groups in the study (Caucasians and Hispanics) demonstrates no trend of any kind,

as the two groups were virtually identical at every level of engagement with the module. One of the smaller ethnic groups in the study, Asian-American students, did show evidence of substantially higher levels of engagement, but given the smaller size of that group, the authors cannot draw conclusions that would impact practice. The university where this study took place is a Hispanic-Serving Institution with substantial populations of both Caucasian and Hispanic students. As a result, the comparison of chief interest for potential application here was between those two groups.

Limitations

The greatest limitation of the study was the size of the sample (181 students), which may have hindered the research team from identifying statistically significant results in areas where there were observable trends. The research team's recruitment efforts were inhibited by several leaks of private information that were highly publicized in the media just prior to Spring Semester 2014. Students were consequently cautious about signing the informed consent forms that would allow the researchers to access their Banner data.

Furthermore, this study focused on a distinctive population. Students of ENG 102 are generally first year students participating in a required course and writing on topics that may fall outside of their chosen majors. Because the institution did not offer composition as a distance learning course at the time the study was conducted, all students were enrolled in fully on-campus courses. Thus, this project can make claims only about on-campus students in an English composition class. Distance students, students taking upper-level courses, or students taking courses within their major may behave differently from the population studied and demonstrate different levels of engagement with online library instruction.

While the authors consciously attempted to maximize the internal validity of this research

study, it was not possible to control every potentially confounding variable. Multiple faculty from the English department taught the different sections of ENG 102. Therefore, students in the various sections may have received divergent instructions regarding expectations for the library module and its relevance to their research assignment. The study also does not report data about students' library and technology experiences outside of ENG 102, such as prior library instruction, or access to the Internet from off-campus. One major demographic category not recorded in the Banner data provided by the institution was socioeconomic level, which the authors would have included in their analysis had it been available. Although the research team designed the online module according to principles of best practice, there are numerous alternative approaches to the delivery of online instructional content that could have impacted the student engagement patterns observed in this study. Due to these potentially confounding factors, the research team cannot make claims regarding causation.

Lastly, this study's measure of student engagement (literally, time spent logged in on each of the pages of the tutorial) has the advantage of being concrete and measurable. However, it does not reflect the qualitative aspects of student engagement that would be important in many contexts. Moreover, because there was no analogous measure of engagement for the face-to-face classes, the authors were unable to make comparisons of engagement between students participating in online instruction and traditional instruction.

Recommendations

The authors ground their analysis of this study in their belief that an effective library instruction program employs diverse pedagogical approaches in order to educate the largest possible number of students. Their institution, therefore, intended to use student engagement data as a means of indicating where online

modules might be implemented most effectively in the library's instruction plan. The academic librarians who formed the research team had hoped that students of ENG 102 would respond enthusiastically to online instruction, given the convenience of the medium and its potential to expand the reach of the library instruction program.

The generally low level of engagement with online instruction across all demographic groups was a disappointing outcome of the study, but one that was highly instructive. Despite the potential convenience of online learning, both for students and librarians, the population under study did not engage with the online module at a high enough level to warrant its widespread adoption for ENG 102 classes at the authors' institution. The institution continues, however, to explore online instruction delivery methods and develop alternative modules for online instruction, under the direction of a newly-hired e-learning librarian.

The authors would recommend that future studies of online library instruction explore how modifications to both the design and delivery of the online module might affect engagement. One particularly promising modification is the use of incentives (especially the most common incentive in higher education: a grade for completion). Incentives might raise engagement levels across all demographic groups, and furthermore might alter some of the trends observed in this study. Another potential modification is the use of online modules with a different student population, such as upper-level undergraduate or graduate students. The authors initially elected to deliver the module through the institution's CMS for ease of student access, but alternative platforms should be considered and studied, especially those that would allow for more interactive module designs.

Given the widespread use in academic libraries of traditional face-to-face instruction, the

authors would recommend that future studies compare engagement in that setting to engagement in the online setting. It is possible that some groups reluctant to engage in one setting will be better served in another, especially given the major differences inherent in the two pedagogical approaches.

Conclusion

This paper presents a case study that investigates the relationship between student demographic characteristics and engagement with online library instruction modules in English 102 courses at a single university. The demographic factors studied were age, cumulative GPA, gender, and race/ethnicity. While no statistically significant associations were found in any demographic category, observable trends tied age and higher GPA to higher levels of engagement with online instruction. These trends are substantial enough to influence current practice at the authors' institution. There was additionally a slight trend linking female participants to higher levels of engagement than their male peers. In the category of race/ethnicity, Hispanic and Caucasian students exhibited similar levels of engagement. Given the limited sample size for the study overall, the authors hope that future investigators will continue to examine the questions raised by this study, in order to more conclusively determine whether demographic characteristics of the student population should guide the design and implementation of online library instruction.

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