

Information Use during the First College Year: Findings from the NSSE Experiences with Information Literacy Module

Kevin Fosnacht



Using data collected from over 17,000 first-year students attending 76 bachelor's-granting U.S. institutions, this study investigated how often students engage in activities associated with developing information literacy skills. It found that most students frequently used information sources in their coursework, but substantially fewer students critically and effectively used information sources. It conducted a latent class analysis which identified four distinct ways or types first-year students engaged with information sources. The study also conducted a multinomial logistics regression analysis to investigate which student and institutional characteristics were correlated with the four latent classes identified.



Today's undergraduates grew up with a wealth of information at their fingertips. A simple Google search instantly provides information ranging from the mundane to specialized knowledge in obscure disciplines. Despite their easy access to information, most students enter into college with poor information literacy skills, as they frequently are unable to effectively use and critically assess information resources.¹ However, information literacy is a skill required for not only college success, but also in the workplace and lifelong learning.² Thus, it is imperative to improve students' information literacy skills immediately upon college entry.

The first-year of college provides perhaps the best opportunity for postsecondary institutions to improve and, if necessary, remediate students' information literacy skills. Information literacy is a skill

common to all disciplines³ and the first college year is unique in that it provides experiences common to all students designed to ease their transition into college. For example, nearly all colleges and universities require incoming students to take an introductory writing course.⁴ Additionally, most colleges offer first-year seminars and/or experience courses, where the curriculum is tailored to the needs of recently enrolled students.⁵ Other programs such as common intellectual experiences and learning communities can also be exploited as opportunities to teach information literacy skills. These programs have been labeled as "high impact" due to their ability to improve a variety of student outcomes, including information literacy.⁶

In this study, I examine how first-year students engaged in various activities associated with information literacy skills development. It is relatively unique

Kevin Fosnacht is Assistant Research Scientist, Indiana University Center for Postsecondary Research, Indiana University, Bloomington, e-mail: kfosnacht@indiana.edu

as it uses data provided by over 17,000 first-year students attending 74 postsecondary institutions. After summarizing the descriptive results, I identify four typologies or ways students engage in information literacy activities using latent class analysis. Finally, I examine what student and institutional characteristics are correlated with the typologies.

Conceptual Framework

This study was guided by student engagement theory. The theory is based upon the simple notion that students' time and effort devoted to educational pursuits results in improved learning and development. The origins of the theory can be traced back to Pace's quality of student effort concept and Astin's student involvement theory.⁷ It is supplemented by Kuh and colleagues' research demonstrating how colleges can engage students outside of the classroom and how these activities benefit students.⁸ Thus, the theory deviates from the work of Pace and Astin⁹ by highlighting the role of colleges and universities in creating an environment that facilitates and encourages engagement.

As student learning and development is derived from both the time spent and level of effort exerted by students, postsecondary institutions are vital to ensuring that students become information literacy proficient. Institutions must academically challenge students through difficult assignments assessed with high standards. Additionally, they must provide resources that support and enable students to meet these challenging assignments by providing access to high quality information sources and having content experts able to help guide students' information searches. By academically challenging and supporting students' learning, college and universities help students develop skills in assessing, critiquing, and using information, skills essential for lifelong learning.

Research Questions

Guided by student engagement theory, I investigated the following research questions:

1. How often do first-year students engage

in activities associated with information literacy skills development?

2. Do first-year students exhibit different patterns of engagement in information literacy activities?
3. If so, which student and institutional characteristics are related to these engagement patterns?

Methods

Data

To analyze these questions, I utilized data collected from the 2014 administration of the National Survey for Student Engagement (NSSE). NSSE is a large multi-institutional survey annually administered to first-year and senior students at baccalaureate-granting colleges and universities. The survey investigates how often students engage in a variety of effective educational practices, how students spend their time, and their perceptions of the college environment. Due to the study's focus on information literacy and first-year students, I limited the sample to first-year students who attended institutions that elected to administer the optional Experiences with Information Literacy module. A total of 17,510 students at 76 institutions met these criteria.

Table 1 contains the characteristics of the sample. About two out of three respondents were female and nearly all students were enrolled full-time. The majority of students were White, while Asians, Blacks, and Hispanics comprised 6, 8, and 14 percent of the sample, respectively. Most students had a parent who earned a bachelor's degree or higher. About forty percent of the students attended private institutions, while the remainder were enrolled in public colleges and universities. 45 percent of the sample attended institutions that award doctoral degrees. 31 and 22 percent of the students were enrolled at master's institutions and baccalaureate colleges, respectively. A majority of the sample attended institutions with undergraduate enrollments of 10,000 students or more.

The Experiences with Information Literacy module was created through a collaboration between

TABLE 1
Sample Characteristics

Student Characteristics	%
Female	64
Full-time	97
Race/ethnicity	
American Indian	<1
Asian	6
Black	8
Hispanic	14
Pacific Islander	0
White	60
Multi-racial	4
Foreign	4
Other/Unknown	3
Parental education	
Less than high school	4
High school diploma	14
Some college	10
Associate's	9
Bachelors	30
Master's	23
Doctoral or professional degree	9
Institution Characteristics	
Private	38
Carnegie Classification (aggregated)	
Doctoral universities	45
Master's colleges and universities	31
Baccalaureate colleges	22
Other	1
Undergraduate enrollment	
Less than 1,000	3
1,000-2,499	19
2,500-4,999	18
5,000-9,999	7
10,000 or more	53
Note: Percentages may not equal 100 due to rounding.	

NSSE and college and university librarians specializing in information literacy.¹⁰ It is a short set of add-on questions that examine how often students engage in activities associated with information literacy skills development and the extent to which their instructors emphasized the proper use of information. Unlike other assessments like iSkills and SAILS, the module was not designed to assess a student's level of information literacy proficiency. Rather, being guided by student engagement theory, it investigates the extent to which institutions create an environment that promotes the development of information literacy skills. I focused on the following items which inquired about how often the respondents:

- Completed an assignment that used an information source other than required course readings
- Completed an assignment that used the library's electronic collection of articles, books, and journals
- Decided not to use an information source in a course assignment due to its questionable quality
- Changed the focus of a paper or project based on information you found while researching the topic
- Looked for a reference that was cited in something you read
- Identified how a book, article, or creative work has contributed to a field of study.

I also utilized data on a number of student and institutional characteristics. The student characteristics were either collected via the core NSSE instrument or provided by the students' institution. The characteristics included were sex, race, on-campus residency status, enrollment status (full- vs. part-time), age, parental education, distance education status, and major. The institutional characteristics used were control (public vs. private), undergraduate enrollment, Barron's selectivity rating, and Basic 2010 Carnegie Classification (aggregated). I also used data on four of the NSSE Engagement Indicators (EI): Higher Order Learning, Reflective & Integrative Learning, Learning

Strategies, and Effective Teaching Practices.¹¹ The EIs are composite variables examining students' engagement in various effective educational practices. The EIs' component items and reliabilities can be found in Appendix A.

Methods

To answer the research questions, I first investigated how often students reported engaging in information literacy activities by examining the frequencies of selected items from the Experiences with Information Literacy module. Next, I examined if the first-year students sampled exhibited particular patterns of engaging with information by analyzing the data using latent class analysis (LCA). The technique groups students in to homogenous populations that exhibited similar patterns of engagement with information sources. Due to the computational intensity of LCA, I limited the sample to 3,000 randomly selected students. Also, in keeping with LCA conventions, I dichotomized the information literacy variables. The "none" and "sometimes" response options were coded as 1, while the "often" and "very often" options were coded as 2. As theory and previous research did not suggest an optimal number of latent groups, I used an exploratory approach and fit a series of models that sequentially increased the number of classes by one. To choose the best fitting model, I examined a handful of fit indices for each model and then performed the bootstrap likelihood ratio test (BLRT) for the most promising models. Then, I reviewed all of the fit indicators and the parameter estimates to pick the best model, keeping in mind that simulation studies have shown that the fit indicators have different levels of predictive accuracy.¹²

To answer the final research question, I created a multinomial logistic regression model that estimated the probability of being in one of the latent classes identified. The independent variables in the model included student characteristics such as gender, race/ethnicity, parental education and major field. I controlled for the following institutional characteristics:

control, undergraduate enrollment, Barron's selectivity rating, and Basic 2010 Carnegie Classification (aggregated). I also included the four NSSE EIs described above in the model.

Since students' latent class membership is unobservable and expressed in probabilities in the LCA model, I used psuedoclass draws to reduce bias and account for the uncertainty of the class assignment. The psuedoclass draw method randomly assigned students to one of the classes based upon their probability of membership. The original dataset was replicated 20 times. I analyzed these datasets using multiple imputation procedures. The multinomial model was estimated for each dataset separately, the estimated coefficients from these models were averaged, and the standard deviations were adjusted to account for the uncertainty of the class assignment per Rubin's method.¹³

Limitations

This study suffers from a handful of limitations. First, the study's sample is comprised of randomly selected students who attended institutions that elected to administer NSSE and the Experiences with Information Literacy module. Due to the institutions' expressed interest in information literacy, the sample respondents may not be representative of first-year students nationally. Second, as discussed below, the LCA results did not point to a clear cut "best" model. Consequently, after reviewing a variety of model fit indicators and the model results, I selected the most likely plausible model. Due to the lack of a clearly identified model and the exploratory nature of the study, the results need to be confirmed by future research. Additionally, LCA can have difficulty identifying rare latent classes, when the true number of classes is large and smaller samples are used. To overcome this problem, I used a relatively large sample in this analysis (3,000 students).

Results

I first examined the frequency of the respondents' engagement in information literacy activities. Figure 1

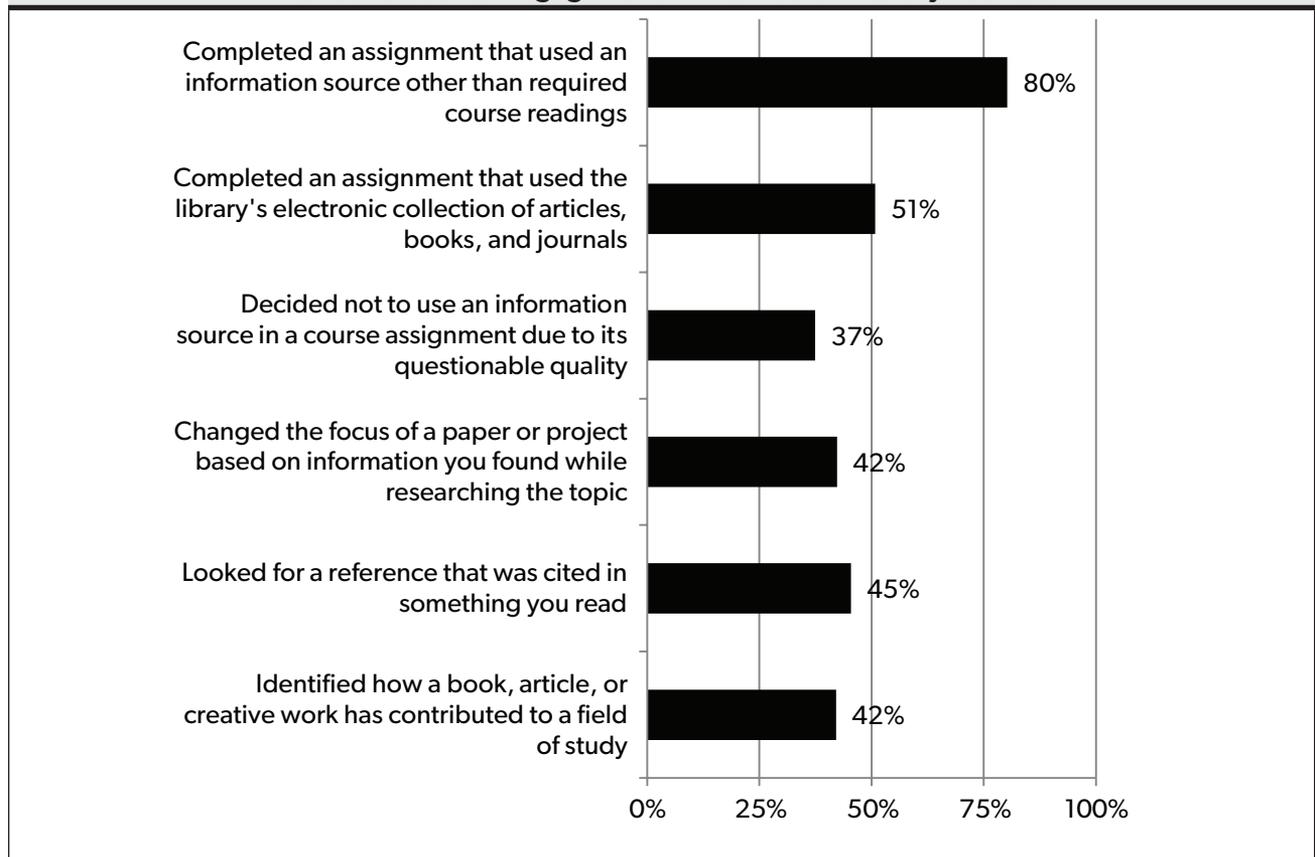
contains the percentage of students who responded “often” or “very often” (subsequently referred to as “frequently”) for selected items from the experiences with information literacy module. Most first-year students in the sample frequently used information besides required course readings to complete assignments. However, only half of the respondents frequently utilized information from their library’s electronic collection. About forty percent of the sample frequently decided not to use an information source due to its questionable quality. A roughly equivalent percentage frequently changed the focus of a paper or project while researching a topic. 45 percent of the sample frequently looked for a reference that was cited in something they read. A similar proportion identified how an information source contributed to a field of study.

Next, I analyzed these items using LCA. The fit indices (table 2) did not point to a single solution, but

rather suggest that a 4, 5, or 6 class solution would be optimal. Simulation studies have shown that the BLRT and BIC are the best indicators¹⁴; therefore I examined the parameter estimates of the 4 and 6 class models. The primary difference between the models is that the 6 class model included a class representing 2 percent of the sample who reported infrequently using information in their course assignments, but frequently engaged in some of the higher level activities. The six class model appears to be capturing a small group of outliers; therefore, I concluded that the four class model contains the best grouping of the respondents.

Figure 2 contains the item probability plot for each latent class and figure 3 contains their proportions. The largest class, *Basic Searchers*, was comprised of the 35 percent of students who frequently used information other than course readings to com-

FIGURE 1
First-Year Students’ Engagement in Information Literacy Activities



Note: Percentage of students who responded “often” or “very often”

TABLE 2
LCA Fit Indices

Classes	AIC	BIC	CAIC	ABIC	BLRT (k vs k+1)	Entropy
2	550	628	641	587	—	.78
3	229	350	370	286	—	.69
4	146	308	335	222	.01	.66
5	122	326	360	218	.01	.60
6	112	358	399	228	.99	.67
7	115	404	452	251	—	.65
8	122	452	507	277	—	.64

Notes: Best model is bolded for each fit index. BLRT = bootstrap likelihood ratio test. BLRT was not calculated for all models (—).

plete an assignment, but did not frequently critically evaluate their sources or conduct deep searches. The remaining groups were estimated to be between 20 and 23 percent of the sample. *Infrequent Users* (22%) contained students who rarely used information beyond course readings to complete an assignment. *Deep Searchers* (20%) was comprised of students who frequently used information sources, looked for references cited in another work, and identified how an

information source contributed to a discipline. The final group (23%), *Critical Searchers*, contained students who frequently engaged in all of the activities included in the model.

Using the LCA results, I examined what student and institutional characteristics were predictive of the information engagement typologies. Table 3 contains the multinomial logistic results that compared probability of a student being in the *Basic Searchers*, *Deep*

FIGURE 2
Item-Response Plots by Latent Class

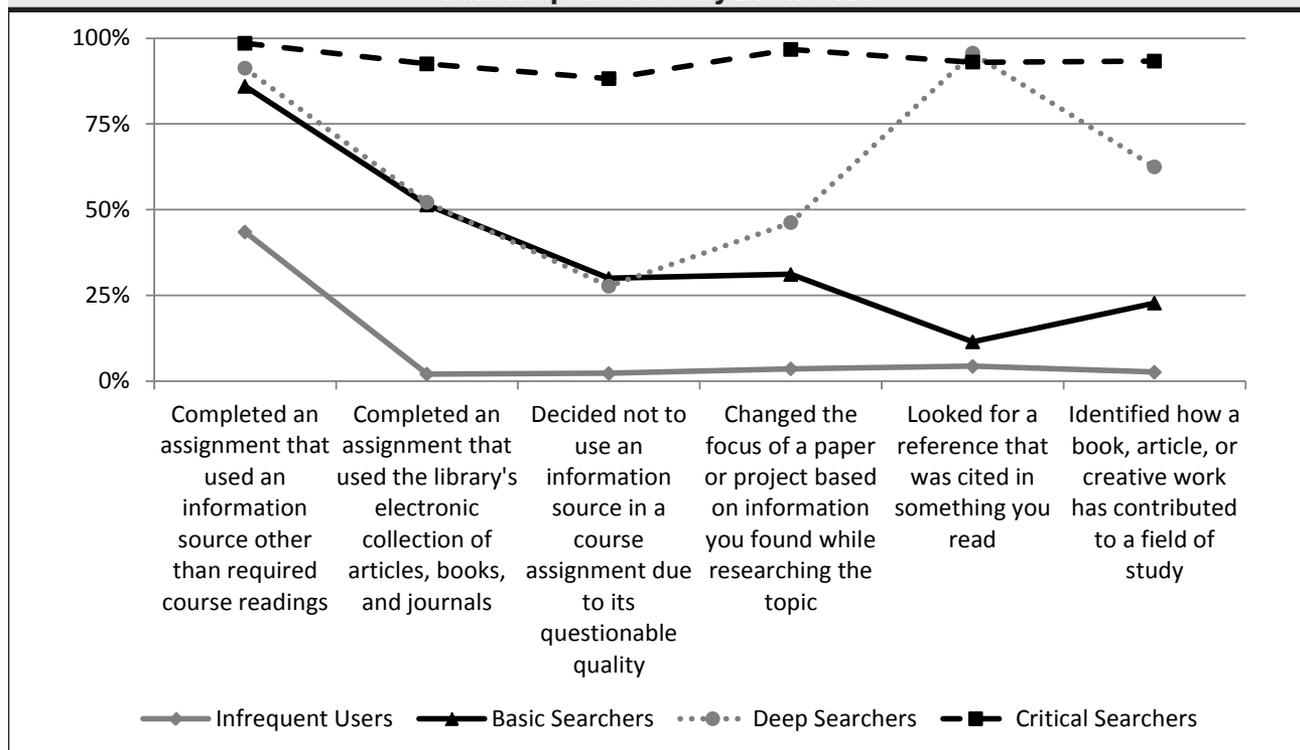
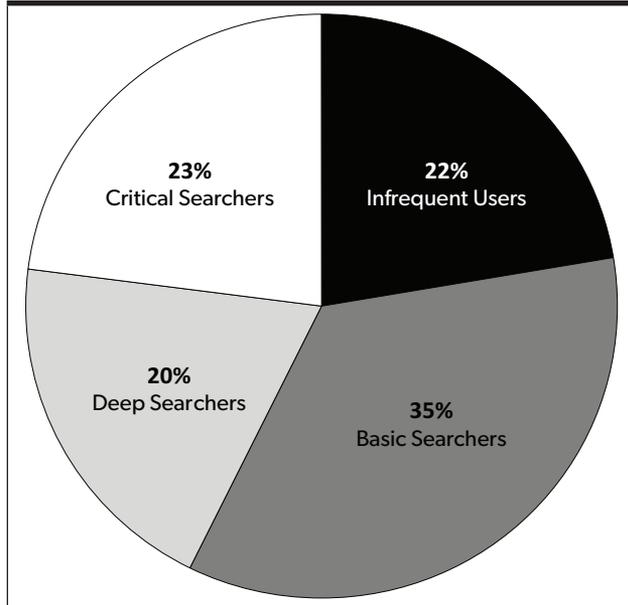


FIGURE 3
Proportions of Each Latent Class



Searchers, and *Critical Searchers* groups to the *Infrequent Users* group, which served as the comparison group. The coefficients presented are relative risk ratios which show the relative change in probability of being in the comparison group versus the *Infrequent Users* or control group for a one unit increase in the variable holding constant other characteristics.

Compared to the *Infrequent Users*, a standard deviation increase in reflective and integrative learning activities was associated with a 55 percent increase in the probability of being a member of the *Basic Searchers* group, controlling for other factors. No other student or institutional characteristic was a significant predictor of being a member of the *Basic Searchers* compared to the *Infrequent Users*. Similar results were found when comparing *Deep Searchers* to the *Infrequent Users*. A standard deviation increase in reflective and integrative learning activities was associated with a 107 percent increase in the probability of being in the *Deep Searchers* group, holding constant other characteristics. However, engaging in learning strategies was also a significant predictor, as a standard deviation increase on this measure was associated with a 34 percent increase in the likelihood of being in the *Deep Searchers* rather than the *Basic Searchers* group.

More characteristics were significant predictors when the *Critical Searchers* were compared to the *Infrequent Users*. Like the other groups, a standard deviation change in reflective and integrative learning activities was associated with a 135 percent increase in the probability of being a member of the *Critical Searchers* rather than the *Infrequent Users*, holding

TABLE 3
Multinomial Logistic Regression Estimates Predicting Latent Class Assignment (N = 2,608)

	Basic Searchers		Deep Searchers		Critical Searchers	
	RRR	Sig.	RRR	Sig.	RRR	Sig.
Higher Order Learning	1.10		1.13		1.30	*
Reflective & Integrative Learning	1.55	***	2.07	***	2.35	***
Learning Strategies	1.14		1.34	**	1.56	***
Effective Teaching Practices	1.08		1.08		1.09	
Male	.93		1.28		1.18	
Race (White)						
Asian	1.00		1.13		1.61	
Black	1.28		1.08		1.78	*
Hispanic	.94		1.00		1.15	
Foreign	1.10		1.51		1.72	
Other	.85		.93		.71	

TABLE 3
Multinomial Logistic Regression Estimates Predicting Latent Class Assignment (N = 2,608)

	Basic Searchers		Deep Searchers		Critical Searchers	
	RRR	Sig.	RRR	Sig.	RRR	Sig.
On-campus resident	.98		.89		1.22	
Full-time	.98		.74		1.13	
Age: 20 or older	.81		.94		1.06	
Parental education (Bachelor's)						
Less than high school	1.19		1.41		1.69	
High school diploma/G.E.D.	.84		1.02		1.09	
Some college	.92		.99		1.23	
Associate's	.85		.84		1.04	
Master's	.98		.83		1.08	
Doctoral or professional degree	.76		.65		.68	
Distance learner	2.19		1.77		1.37	
Major (Business)						
Arts & Humanities	1.04		.97		.71	
Biological Sciences	1.12		1.27		1.05	
Phy. Sci., Math., & Comp. Sci.	1.05		.86		.51	
Social Sciences	1.13		1.30		1.15	
Comm., Media, & PR	1.11		1.96		1.18	
Education	1.05		1.07		1.15	
Engineering	.80		.84		.72	
Health Professions	1.09		1.36		1.27	
Social Service Professions	1.22		2.16		1.84	
All Other	.93		1.01		.71	
Undecided, undeclared	.73		.72		1.06	
Private	.77		.75		.63	**
UG enrollment (1,000s)	1.00		.99		1.01	
Barron's rating	.98		.93		.87	
Carnegie Classification (Doctoral)						
Master's	1.14		1.15		1.78	*
Baccalaureate	1.21		1.17		2.51	**
Constant	2.61		1.91		.75	

Note: Results averaged across 20 models where the latent class was randomly assigned based on the probability of latent group membership. Standard errors adjusted to account for the uncertainty of the latent class membership. *** p < .001; ** p < .01; * p < .05

constant other characteristics. Similarly, engaging in learning strategies was also correlated with being a member of the *Critical Searchers* group. However, the amount of emphasis students' coursework placed on higher order learning activities was also related to group membership. A standard deviation change in this measure was associated with a 30 percent increase in the probability of being a *Critical Searcher*, holding other variables constant. Black students were 78 percent more likely than White students to be a *Critical Searcher* than an *Infrequent User*, after controlling for other factors. *Critical Searchers* tended to attend public institutions, as attending a private institution was associated with a 37 percent reduction in the probability of being a *Critical Searcher* rather than an *Infrequent User*, after controlling for other characteristics. Students at baccalaureate and master's institutions were 151 and 78 percent, respectively, more likely to be members of the *Critical Searchers* group than students at doctoral institutions, holding other characteristics constant.

Discussion

Information literacy is a critical skill not only for college success, but also lifelong learning.¹⁵ However, college students, particularly those newly enrolled, frequently struggle to effectively use and assess information sources.¹⁶ In this study, I examined how first-year students engaged with information sources using a large multi-institutional sample. I found that most first-year students frequently used information sources to complete course assignments. However, substantially fewer students critically and effectively used information sources.

Next, I examined if students' information engagement behaviors could be classified into latent typologies using LCA. This analysis identified the following four typologies: *Infrequent Users*, *Basic Searchers*, *Deep Searchers*, and *Critical Searchers*. Approximately 22 percent of the students were *Infrequent Users* and these students, on average, infrequently used information sources, other than required readings, to complete an assignment. The second and largest group,

Basic Searchers, contained about 35 percent of the sample. These students frequently used information sources to complete assignments and may have used their libraries electronic collection, but did not critically examine or deeply search for information sources. About 20 percent of students were members of the *Deep Searchers* group, which features students who frequently used information sources and conducted extensive information searches, but frequently did not critically assess their information sources. The final group, *Critical Searchers*, was comprised of the 23 percent of students who reported that they frequently conducted deep information searches and critically assessed their information sources.

These results comport with prior research indicating that the majority of undergraduates are not sophisticated consumers of information.¹⁷ They also indicate that first-year students enter into college with a wide range in their level of information literacy proficiency. *Critical Searchers* appear to either meet or be on the verge satisfying the current definition of being information literate: being "able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information."¹⁸ However, the equivalent percentage of students that comprised the *Infrequent Users* group rarely used information sources beyond their required course readings. This suggests that many faculty fail to create assignments that help students improve their information literacy skills. In between these two extremes, the *Basic Searchers* and *Deep Searchers* appear to recognize their need for information, but lack the ability to locate and/or evaluate information sources.

The final analysis examined which student and institutional characteristics were correlated with the information engagement typologies. The best predictor of group membership was the frequency students engaged in reflective and integrative learning activities. A standard deviation increase in this measure was associated with a 55, 107, and 135 percent increase in the probability of being a *Basic*, *Deep*, or *Critical Searcher* rather than an *Infrequent User*, holding other characteristics constant respectively.

Similarly, the frequency students engaged in learning strategies, such as reviewing key information from reading assignments and summarizing class notes, was a significant predictor of group membership. No other characteristics were significant predictors that distinguished *Infrequent Users* from the *Basic* and *Deep Searchers*.

The multinomial logistic model's results indicate that there are few, if any, easily observable characteristics correlated with the four information engagement typologies, as characteristics such as gender, age, and major were not significant. Rather, the best predictors were the frequency students engaged in reflective and integrative learning activities and the extent to which they used common learning strategies. This suggests that an alternative method to improve information literacy might be to encourage students to engage in reflective and integrative learning activities, like combining ideas from different courses or examining the strength and weakness of your own views, or learning strategies, such as identifying key information in reading assignments or summarizing notes. However, the results largely did not find a correlation between classroom activities and the typologies. The Effective Teaching Practices EI was not a significant predictor in any of the models and the extent to which classroom activities emphasized higher order learning activities was only significant when comparing *Critical Searchers* to *Infrequent Users*. This suggests that classroom instruction and activities do not have a strong relationship with encouraging students to engage in information literacy activities.

Overall the results indicate that first-year students have wide varying information literacy instructional needs. About a quarter of students did not recognize their need for information. In contrast, an equivalent percentage of first-year students engaged in activities that suggest they are relatively sophisticated users of information. The remaining 50 percent of students conducted information searches that were not critical of the information obtained and/or used the information to obtain more information. These wide varying needs and the negligible correlation of Ef-

fective Teaching Practices and Higher Order Learning with the typologies suggest that information literacy instruction needs to be specifically tailored to a particular student's needs. For example, encouraging students to critically evaluate information in a group setting will mostly not help a student who does not recognize their information needs to complete course assignments.

In addition to tailoring instruction to undergraduates' personal needs, students' information literacy could be improved before entering college. Many first-year students do not appear to meet the American Association of School Librarians and common core information literacy standards.¹⁹ This suggests that more effective means of improving information literacy skills might be to collaborate with high school librarians and faculty. Due to the impending adoption of the common core, high school faculty and librarians may welcome a greater knowledge of the information literacy skills required for undergraduate success and integrate them into their lesson plans. Additionally, high school teachers may be best equipped to develop information literacy skills as they work with students over longer time periods than postsecondary faculty and typically require more assignments, which can be used to provide feedback to students on their information literacy skills.

Due to the exploratory nature of the study, future research needs to attempt to duplicate these results. Upon confirming these results, researchers should investigate which practices are most effective in promoting information literacy skills development among the four typologies identified by this study. This knowledge will allow for increased personalization in information literacy skills instruction and hopefully a more information literate society. It would also be advantageous to replicate this study using different student populations, like juniors or seniors. As students progress through college, they should become engaged with information sources in different ways than first-year students. Such as study could illuminate how the information needs of students change over time.

Appendix A. NSSE Engagement Indicators Component Items and Reliabilities

Higher-Order Learning ($\alpha = .85$)

During the current school year, how much has your coursework emphasized the following [Response options: Very little, Some, Quite a bit, Very much]:

- Applying facts, theories, or methods to practical problems or new situations
- Analyzing an idea, experience, or line of reasoning in depth by examining its parts
- Evaluating a point of view, decision, or information source
- Forming a new idea or understanding from various pieces of information

Reflective & Integrative Learning ($\alpha = .88$)

During the current school year, how often have you [Response options: Never, Sometimes, Often, Very Often]:

- Combined ideas from different courses when completing assignments
- Connected your learning to societal problems or issues
- Included diverse perspectives (political, religious, racial/ethnic, gender, etc.) in course discussions or assignments
- Examined the strengths and weaknesses of your own views on a topic or issue
- Tried to better understand someone else's views by imagining how an issue looks from his or her perspective
- Learned something that changed the way you understand an issue or concept
- Connected ideas from your courses to your prior experiences and knowledge

Learning Strategies ($\alpha = .77$)

During the current school year, how often have you [Response options: Never, Sometimes, Often, Very Often]:

- Identified key information from reading assignments
- Reviewed your notes after class
- Summarized what you learned in class or from course materials

Effective Teaching Practices ($\alpha = .85$)

During the current school year, to what extent have your instructors done the following [Response options: Very little, Some, Quite a bit, Very much]:

- Clearly explained course goals and requirements
- Taught course sessions in an organized way
- Used examples or illustrations to explain difficult points
- Provided feedback on a draft or work in progress
- Provided prompt and detailed feedback on tests or completed assignments

Notes

1. Educational Testing Service, "ICT Literacy Assessment: Preliminary Findings," https://www.ets.org/Media/Products/ICT_Literacy/pdf/2006_Preliminary_Findings.pdf; Association of College and Research Libraries, "Information Literacy Competency Standards for Higher Education," <http://www.ala.org/acrl/standards/informationliteracycompetency>; David T. Conley, "Understanding University Success: A Project of the Association of American Universities and the Pew Charitable Trusts," (Eugene, OR: Center for Educational Policy Research, 2003); Lynda M. Duke and Andrew D. Asher, eds., *College Libraries and Student Culture: What We Now Know* (Chicago: American Library Association, 2012).
2. Association of College and Research Libraries, "Information Literacy Competency Standards for Higher Education"; Association of American Colleges and Universities, "College Learning for the New Global Century," (Washington, DC: Author, 2007); "The Prague Declaration: Towards an Information Literate Society," <http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/PragueDeclaration.pdf>; Lumina Foundation, "The Degree Qualifications Profile: A Learning-Centered Framework for What College Graduates Should Know and Be Able to Do to Earn the Associate, Bachelor's or Master's Degree," (Indianapolis, IN: Author, 2014); Hart Research Associates, "Raising the Bar: Employers' Views on College Learning in the Wake of the Economic Downturn," https://www.aacu.org/sites/default/files/files/LEAP/2009_EmployerSurvey.pdf; American Library Association, "Presidential Committee on Information Literacy: Final Report," American Library Association, <http://www.ala.org/acrl/publications/whitepapers/presidential>.
3. Association of College and Research Libraries, "Information Literacy Competency Standards for Higher Education".
4. Mary Kate Boyd-Byrnes and Dona McDermott, "Reaching First Year College Students: Current Practices in Instructional Programs," *Public Services Quarterly* 2, no. 4 (2007); Debbie Malone and Carol Videon, "Models of Library Instruction for First-Year Students," in *The Role of the Library in the First College Year*, ed. Larry Hardesty (Columbia, SC: National Resource Center for The First-Year Experience and Students in Transition, 2007).
5. Colleen Boff and Kristin Johnson, "The Library and First-Year Experience Courses: A Nationwide Study," *Reference Services Review* 30, no. 4 (2002); John N Gardner, Debra Decker, and Francine G McNairy, "Taking the Library to Freshman Students Via the Freshman Seminar Concept," in *Advances in Library Administration and Organization*, ed. Gerard B McCabe and Bernard Kreissman (Greenwich, CT: JAI Press, 1986); Boyd-Byrnes and McDermott, "Reaching First Year College Students: Current Practices in Instructional Programs; Malone and Videon, "Models of Library Instruction for First-Year Students."
6. George D. Kuh, "High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter," (Washington, DC: Association of American Colleges and Universities, 2008); Catherine Fraser Riehle and Sharon A. Weiner, "High-Impact Educational Practices: An Exploration of the Role of Information Literacy," *College & Undergraduate Libraries* 20, no. 2 (2013).
7. Alexander W. Astin, "Student Involvement: A Developmental Theory for Higher Education," *Journal of college student personnel* 25, no. 4 (1984); C. Robert Pace, "Measuring the Quality of College Student Experiences. An Account of the Development and Use of the College Student Experiences Questionnaire," (Los Angeles, CA: Higher Education Research Institute, 1984).
8. George D. Kuh et al., *Involving Colleges: Successful Approaches to Fostering Student Learning and Development Outside the Classroom* (San Francisco: Jossey-Bass, 1991).
9. Astin, "Student Involvement: A Developmental Theory for Higher Education; Pace, "Measuring the Quality of College Student Experiences. An Account of the Development and Use of the College Student Experiences Questionnaire."
10. Kevin Fosnacht, "Information Literacy and Nsse: Introducing the Experiences with Information Literacy Module," *College & Research Libraries News* 2014.
11. National Survey of Student Engagement, "Engagement Indicators" http://nsse.iub.edu/html/engagement_indicators.cfm.
12. Karen L Nylund, Tihomir Asparouhov, and Bengt O Muthén, "Deciding on the Number of Classes in Latent Class Analysis and Growth Mixture Modeling: A Monte Carlo Simulation Study," *Structural Equation Modeling* 14, no. 4 (2007).
13. Donald B. Rubin, *Multiple Imputation for Nonresponse in Surveys*. (New York: Wiley, 1987).
14. Nylund, Asparouhov, and Muthén, "Deciding on the Number of Classes in Latent Class Analysis and Growth Mixture Modeling: A Monte Carlo Simulation Study."
15. "The Prague Declaration: Towards an Information Literate Society"; Association of American Colleges and Universities, "College Learning for the New Global Century; Association of College and Research Libraries, "Information Literacy Competency Standards for Higher Education"; Lumina Foundation, "The Degree Qualifications Profile: A Learning-Centered Framework for What College Graduates Should Know and Be Able to Do to Earn the Associate, Bachelor's or Master's Degree; Hart Research Associates, "Raising the Bar: Employers' Views on College Learning in the Wake of the Economic Downturn"; American Library Association, "Presidential Committee on Information Literacy: Final Report".
16. Association of College and Research Libraries, "Information Literacy Competency Standards for Higher Education"; Conley, "Understanding University Success: A Project of the Association of American Universities and the Pew Charitable Trusts; Duke and Asher, *College Libraries and Student Culture: What We Now Know*; Educational Testing Service, "ICT Literacy Assessment: Preliminary Findings".
17. Duke and Asher, *College Libraries and Student Culture: What We Now Know*; Educational Testing Service, "ICT Literacy Assessment: Preliminary Findings"; Hart Research Associates, "Raising the Bar: Employers' Views on College Learning in the Wake of the Economic Downturn".
18. American Library Association, "Presidential Committee on Information Literacy: Final Report": para. 3.
19. American Association of School Librarians, "Learning Standards & Common Core State Standards Crosswalk," <http://www.ala.org/aasl/standards-guidelines/crosswalk>.