
Graduate in Four Years? Yes, the Library Can Help with That!

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Abstract

Since fall 2011, our library has been collecting usage data for several types of library interactions: loans, digital use, public workstation use, online reference interactions, and instruction. We have found positive correlations between first-year students' use of the library and a variety of success measures, from GPA to academic engagement.

By the spring of 2015, many members of that first cohort had graduated. We matched the data from their first year with information on whether they had graduated, were still active students, or had withdrawn. We hoped to determine whether there was a correlation between library use in the first year and graduation within four years, as well as whether there was a correlation between library use in the first year and retention at the four-year mark (as opposed to withdrawal).

At the same time, we chose to apply a different statistical technique, propensity score matching, in this analysis. Our previous work used regression analysis to account for factors that might also affect student outcomes. Such analysis is more robust than simply comparing one group's GPA to another's, but propensity score matching allows us to construct "control" and "treatment" groups after the fact that are very similar to each other, further reducing the bias inherent in any work where members of the group self-select their membership.

Using propensity score matching and the 2011 cohort, our results suggest that using the library at least one time in the first year of enrollment significantly increased the odds that a student would graduate in four years or remain enrolled after four years as opposed to withdrawing from the university. In fact, students who used electronic resources during their first year were almost twice as likely to graduate in four years as those who did not.

Introduction

When our small group at the University of Minnesota Libraries began collaborating with

the University Office of Institutional Research, we focused first on success measures relevant for first-year students: grade point average (GPA) and retention to the second semester and second year.¹ These measures are both relatively easy to collect from institutional records and good indicators of a student's likelihood to earn their degree. We were encouraged by the positive correlations we found between the fall 2011 first-year cohort's success measures and their use of different types of library resources and services. Even then, we were speaking of that distant point in the future when we would be able to look for correlations between library use and earning a degree in a timely manner.

In 2015, we realized that our first cohort had reached the "four-year graduation" mark. Those students who started in fall 2011 and stayed "on track" throughout would have graduated in May. Those who had not graduated yet but were still enrolled were likely to achieve their degree in another year or two.

Graduation as a Success Measure

Graduation rate is defined as the percent of first-time, first-year undergraduate students who complete their program within a certain time. Any US institution that awards federal student aid is required to report the graduation rate as "[t]he percentage of a school's first-time, first-year undergraduate students who complete their program within 150% of the standard time for the program."² Most University of Minnesota undergraduate degrees are four-year programs, so six-year graduation rate is reported to the US Department of Education.

Four-year graduation rate is commonly used by college ranking systems such as US News & World Report.³ Prospective students (and their parents) generally budget for four years' worth of tuition and obtain a four-year degree in that time, so they look for institutions that show evidence of helping past students reach that goal.

Supporting Graduation at the University of Minnesota

The University of Minnesota has had a policy regarding “timely graduation” since at least 2009. The policy statement “Promoting Timely Graduation by Undergraduates” specifies responsibilities for both the institution and the student with this stated purpose:

Timely graduation is an underlying foundational principle for undergraduate education at the University. To make the best use of students’ resources, as well as University resources, students must pursue their undergraduate degree(s) in a timely fashion and are not allowed to register for courses indefinitely without having a formal plan for timely completion of a degree. This policy implements criteria and requirements for accreditation established by the Higher Learning Commission.⁴

The Office of Institutional Research (OIR) compiles and publishes graduation and retention data annually,⁵ and the university promotes timely graduation to students as a goal through multiple venues, such as Student Services’ “How to Graduate in Four Years” webpage.⁶

In 2015, the Minnesota State Legislature added even more weight to this already important measure by making five percent of the university’s \$1.1 billion in funding for operations and maintenance contingent upon meeting certain goals. Two of the five goals include graduation rate:

- “Increase by at least 1 percent the four-year, five-year, or six-year undergraduate graduation rates, averaged over three years, for students of color system wide at the U of M reported in fall 2016 over fall 2014.”⁷
- “Increase by at least 1 percent the four-year undergraduate graduation rate at the University of Minnesota reported in fall 2016 over fall 2014.”⁸

Graduating in a timely manner is as much to the student’s benefit as the institution’s, now more than ever. In bygone days, public higher education was funded primarily with state and local moneys. As government budgets have been cut, public institutions have come to rely primarily on tuition dollars. As tuition increases to meet the funding need, individual student loan debt also increases.

Finishing a degree in a timely manner means borrowing less money. Students who take longer to complete degrees also lose wages they could have been earning if they had completed a degree. Obviously, students who are unable to complete a degree are doubly burdened—they have no degree but they do have debt to repay. Thus, it is imperative that the entire campus is geared towards student success and graduating students on time—even the library.

But Is the Library Important?

Clearly, libraries are one piece of a large and complex network of student experiences that contribute (or do not contribute) to success. However, much of the literature around student success, such as Pascarella and Terenzini’s *How College Affects Students: Findings and Insights from Twenty Years of Research*, Astin’s *What Matters in College: Four Critical Years Revisited* (1993), or Kuh’s chapter in *Challenging and Supporting the First-Year Student: A Handbook for Improving the First Year of College*, either do not mention or barely mention the library.⁹

Often in previous studies such as these, libraries collected use data through surveys and other self-reported measures. Kuh and Gonyea¹⁰ found that “library use did not appear to make independent contributions to desirable outcomes of college.” Also, Pike and Kuh¹¹ used four factors to measure academic engagement: library experience, active and collaborative learning, writing experiences, and interactions with faculty. For both studies, the authors used data from the College Student Experience Questionnaire (CSEQ). The authors point out that student self-reported data is problematic. In past decades, it was difficult, if not impossible, to systematically collect information about student use of the library. That time has passed. Now we are able to directly measure at least some of the ways students use our collections, resources, and services. The data we have been analyzing measures deliberate actions of students. There are still many things we do not know (i.e., did they read that journal article?) but it is a step forward.

With our latest work, we hope to refresh and reexamine the importance of the library in supporting student success and retention. Clearly using the library in a vacuum is not what this is all about; rather, library use is really a potential measure of many practices and skills. Among them:

- curiosity and inquiry
- integrating a wide variety of high quality and diverse sources
- analyzing sources and thinking critically
- studying and working in an academic place on campus focused on productivity and scholarship
- getting expert help
- deeper learning about course topics and related research topics
- organizing information, PDFs and citations

We believe libraries are inherently “educationally purposeful.” We suspect that library use may be a meaningful surrogate for academic engagement. As Pascarella and Ternizin wrote, those who partake of “educationally purposeful activities report gaining more from college compared with their peers who engage less frequently in such activities or who focus on only one or two areas.”¹² Tinto¹³ used library as one measure of academic engagement in comparing different classroom experiences. It may be part of measuring the “symbiotic” relationship between faculty members and the institution to provide high quality and engaging learning opportunities.

University of Minnesota-Twin Cities: Our Context

The University of Minnesota-Twin Cities is a large, urban, R1 institution. It is Minnesota’s land grant and is the largest institution in the state. The total university enrollment is over 48,000 students, with about 30,500 undergraduates and 16,300 graduate and professional students as of 2015.¹⁴

Undergraduates

We have a large campus with over 150 possible majors for undergraduates, from accounting to youth studies. We have eight undergraduate admitting colleges, with the College of Liberal Arts and the College of Science and Engineering having the most students with 13,600 and 5,332 respectively.¹⁵ The majority of our students are full time (92%).¹⁶

About 20% of students identify as a race or ethnicity other than white, not including international students. As of spring 2016, international students make up about 9% of our undergraduate population. The majority of our students, about 66%, are from the state of Minnesota. For our incoming first year students in fall 2015, about 27% were first generation students and 18% were Pell Grant eligible students. The average ACT score is 28.2 and the average high school rank is 86.5%. The majority of our first-year

students live on campus during their first year, with over 88% living in one of 12 residence halls.¹⁷

Library Data and Student Success: Previous Findings

In the spring of 2011, a small group of library staff decided to conduct a pilot study loosely modeled on a 2009 Minnesota study that found correlations between use of the campus recreation center and first-year retention rate as well as five-year graduation rate.¹⁸ We sought to:

- collect data that included Internet ID from as many library service and resource usage points as possible¹⁹
- engage with the Office of Institutional Research (OIR) to match student use with student demographics and success measures; and
- work with OIR to conduct a statistical analysis and determine whether any correlations existed between library usage and success measures.

Data gathered by the libraries in summer 2011 and analyzed by OIR yielded results that were promising enough for OIR to agree to participate in a more fulsome study during fall 2011. That study launched a fruitful ongoing collaboration between OIR and the libraries. Among our statistically significant findings for the fall 2011 and fall 2012 first-year, first-time cohorts:

- For the 2011 cohort, using a library service at least once in the first semester correlates to a higher first semester GPA and to retention from first to second semester.²⁰
- Similarly, using a library service at least once in the first year correlates to higher first year GPA and to retention first to second year.²¹ This study analyzed the same cohort as our first study, but after their first full year, bolstering our confidence in the results of the first study.
- For the 2011 cohort, use of library services and resources correlated with academic engagement and engagement in scholarship as measured by the Student Experience in a Research University (SERU) survey.²²
- For the 2012 cohort, students with lower socioeconomic status backgrounds were somewhat less likely to use library services and resources in several (but not all) areas.²³ For this study, socioeconomic status background was determined using students’ responses to the Cooperative Institutional Research Program (CIRP) Freshman Survey given to the 2012 cohort. While results of the study were

somewhat mixed, they provide a starting point as we determine how to identify and reach out to students who may need more help or encouragement to engage with library resources when they need them.

The methods used in our studies included controlling for students' demographic characteristics (sex, race/ethnicity, international status, Pell Grant recipient, first-generation college students), pre-college academic characteristics (ACT score, AP credits), and collegiate experiences (living on campus, participation in a freshman seminar, college of enrollment).

Improving Our Methods: Propensity Score Matching

When we present our work, we are often asked whether our results show that using library resources and services **causes** students to be more successful. Our answer is, of course, no. We are neither able nor willing to do carefully controlled double-blind studies with our students, dividing them randomly into groups and denying one group library services and resources. Instead, we continue to perform observational studies. Each positive result contributes to the case that libraries can make a difference and helps us identify how and when to engage with our students to maximize our resources and their benefit. As we progress, we seek out ways to improve our methods, whether by identifying more independent variables, improving the depth and accuracy of the library usage data we collect, or improving analysis methods.

The regression analysis techniques used are common to social science research and the correlations identified thus far have helped us refine and target both our services and our data collection practices. One limitation has always been selection bias: students determine on their own whether they will be a library user or not, and it may be that students who are going to be successful anyway just happen to be the kind of students who like to use libraries.

For the graduation rate study, though, we followed the lead of Chiteng Kot and Jones²⁴ and used a technique called propensity score matching instead of the regression analysis methods of our previous studies. Propensity score matching allows the researcher to construct something like an experimental study and reduce the impact of selection bias.

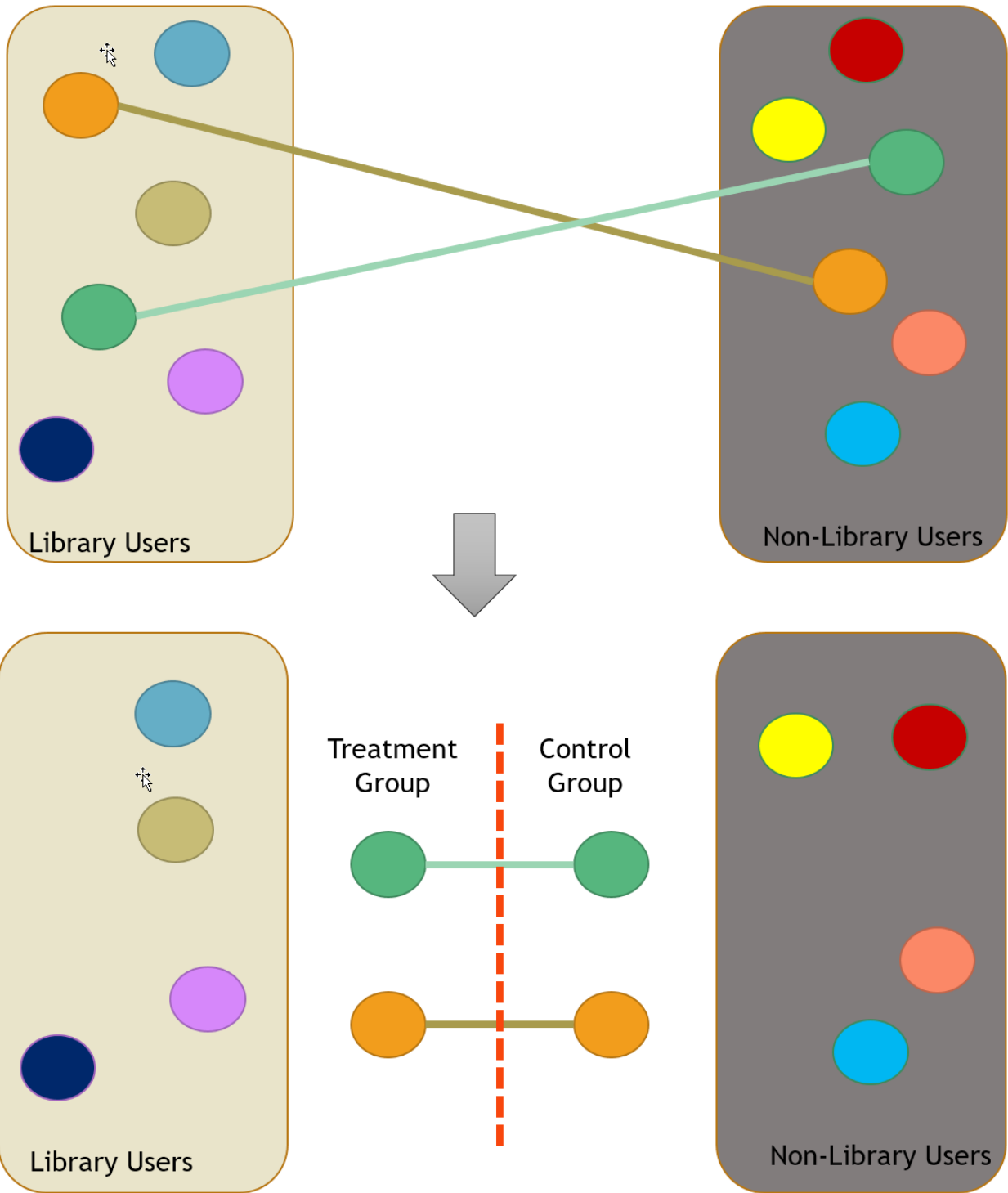
We describe the method we use in a forthcoming article.²⁵ For non-statisticians (including the librarians involved in the project), the technique looks like this:

1. Describe each student in the study (5,368 first-year undergraduates in 2011) in terms of the indicators known to relate to students' use of library services and resources. Based on our past work, we identified these factors:
 - a. Race/ethnicity
 - b. Sex
 - c. On-campus residency
 - d. First-generation status
 - e. Participation in a freshman seminar
 - f. College of enrollment
 - g. Socioeconomic status as measured by Pell Grant
 - h. Incoming ACT/SAT scores
2. For each aspect of library services and resources, calculate the probability that each student will use that aspect based on the indicators identified in (1). That probability is the person's "propensity score." For this study, we grouped the library services and resources measured into five aspects:
 - a. Borrowing books (including interlibrary loan and e-books)
 - b. Using electronic resources (including academic journals, databases, and use of our website)
 - c. Logging into a computer workstation in a library
 - d. Course integrated library instruction, workshop, or completing online tutorial
 - e. Using reference services (including peer library tutoring and the chat reference service)
3. Working with one aspect at a time, split the group in two:
 - a. The "treatment" group is the group of students who *did* make use of the library service or resource
 - b. The "control" group is the group of students who *did not* make use of the library service or resource
4. Match each person in the treatment group with the person in the control group with the closest propensity score (Figure 1).
5. Controlling for propensity scores, perform multinomial logistic regression analysis to

determine the odds of graduating in four years

and of continued enrollment after four years against withdrawal from the university.

Figure 1. Simplified view of the propensity score matching method



Results

Results of the study suggest that using a library resource or service at least once in the first year of enrollment significantly increased the odds that students would graduate in four years or remain enrolled after four years as opposed to withdrawing from the university. The largest increase in odds occurred with electronic resource use: students who used electronic resources were nearly twice as likely to graduate in four years. Those not using electronic resources were significantly more likely to still be enrolled at the university.

Borrowing books increased odds of graduation in four years, but showed no effect on continued enrollment.

The inverse was true of library instruction: while library instruction did not significantly affect odds of graduation in four years, students who had library instruction were significantly more likely to still be enrolled after four years.

Results are summarized in Table 1 and fully described in our forthcoming paper.²⁶

Table 1. Likelihood of continued enrollment and graduation in four years against withdrawal from the university

Library Use	Continued Enrollment	Graduation in Four Years
Any library resource	1.389 times more likely	1.441 times more likely
Electronic resources	1.450	1.924
Books	No effect	1.337
Workstations	No effect	No effect
Library instruction	1.402	No effect
Peer/Reference	No effect	No effect

Limitations and Possible Improvement

Although propensity score matching helps create balanced groups of library users versus non-users for analysis, we still do not know that we have accounted for all of the factors that might affect whether or not a student chooses to use the library. We will continue look for and evaluate possible contributing factors so we can add them to future analyses.

For example, we have another set of data available for the 2012 cohort: the CIRP (Cooperative Institutional Research Program) Freshman Survey administered by the Higher Education Research Institute. We know from previous (unpublished) analysis that factors such as the student's self-reported academic motivation while in high school seem to affect whether or not the student uses the library in his or her first year of enrollment. Since we have this self-reported information for the 2012 cohort, we could enhance the propensity score calculation by adding responses to the questions from the survey that seem to be relevant to the students' choice to use library resources and services.

What Now?

As we continue to demonstrate correlations between library use and student success and timely graduation rate, we are pondering what to do next.

Better Data Collection

Throughout the five years of our ongoing study, data collection has remained a moving target. For example, in 2014 our libraries migrated to a new integrated library management system (Ex Libris Alma), new discovery layer and website (Primo + Primo Central Index), and new authentication system. We had to reevaluate data collection processes to identify data points similar to what we had been using.

Another challenge is the time and effort to collect usage data on some of our access points, such as instruction. We feel instruction data is vital to the project but it is also the most time consuming to collect and some of the most suspect. We are seeking to balance the time spent collecting data with the value of the data analysis to the libraries, the university, and the students.

We would like to gather additional data sources, such as “card swipes” at service points. Such additional data collection decisions require careful consideration so that students are not discouraged from making use of our services, their privacy is preserved, and the libraries are able to derive information from the data that benefits the students.

Working with Campus Partners

We are striving to raise our visibility as a meaningful campus partner in academic engagement. We use this work to show potential partners that we are an important part of a student’s experience on campus and a potential contributor to each student’s success. This requires bridging the academic services and student services divide.

We have been nurturing our relationship with the professional academic advisors on campus. Each of our undergraduate colleges employs college level advisers. These advisers work with students in their first two years of college and help with a wide variety of support services such as registering for classes and timely connections to needed resources like financial aid, mental health, and tutoring. Students generally work with a major adviser in their junior year once they have declared or applied for their major.

Our campus uses an Integrated Planning and Advising Service (IPAS)²⁷ called APLUS. This system seamlessly connects advisers with services on campus like financial aid counselors or study abroad advisers or academic tutoring, for example. The libraries have been able to become part of this ecosystem in two ways. First, advisers have told us that it would be useful to know whether a student had completed an introductory library workshop (generally part of the first year writing course). Therefore, on a weekly basis, we feed data into APLUS by sending names of students who have completed the workshop. The student’s record lists that workshop alongside other contacts. This data point added to the rest of the information in a student’s record can help give a more complete picture of student engagement.

Our second APLUS integration involves referrals from advisers to the libraries. For example, after talking with a student who expresses worry over an upcoming research paper, the adviser could ask the student if they want a librarian to contact them. If the answer is yes, the adviser could add

a tag. This generates an alert to the libraries. We then contact the student directly and offer the appropriate services.

Although this referral mechanism is in pilot phase and has had lower usage than we had hoped for, we have seen examples from both ends of the academic spectrum. For example, we have had alerts for first-year students who are new to the libraries and academic research. We have also had alerts for upper level students who were interested in getting involved in sponsored research on campus and needed help identifying articles written by a faculty member with whom they were interested in working.

By working with advisers, we hope to see whether there are differences between students who are not using library resources at the same rate as more successful students. Could lack of library use be seen as a “pink flag”?²⁸ It is unlikely that the lack of library use is on par with more dramatic “red flags” such as missing a significant number of classes. However, it may be a factor that could help students and support staff discover a gap or need while they are still able to take action.

Clearly, using the library is not the same in every major or course, and library data needs to be analyzed to take that into account. Through this work, we are poised to participate in campus discussions around what data to feed into learning analytics systems and other assessment tools. As work continues on initiatives like predictive analytics, library data may prove to be one useful measure to demonstrate student’s academic engagement or academic disengagement.

This work is not just about individual student behavior. Libraries must examine our own gaps and find places where we can help to induce students towards meaningful educational opportunities.²⁹ This could take many forms ranging from orientation and outreach activities for all incoming students—both first-year and transfer students—to programs aimed at reaching specific populations such as low income, first generation, students of color, international students, etc. This is continually challenging as library budgets are in decline, but we believe it is vital work for our students’ success and our institution’s success.

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Endnotes

1. Krista M. Soria, Jan Fransen, and Shane Nackerud, "Library Use and Undergraduate Student Outcomes: New Evidence for Students' Retention and Academic Success," *portal: Libraries and the Academy* 13, no. 2 (2013): 147–64, https://www.press.jhu.edu/journals/portal_libraries_and_the_academy/portal_pre_print/current/articles/13.2soria.pdf, doi:10.31353/pla.2013.0010; Krista M. Soria, Jan Fransen, and Shane Nackerud, "Stacks, Serials, Search Engines, and Students' Success: First-Year Undergraduate Students' Library Use, Academic Achievement, and Retention," *The Journal of Academic Librarianship* 40, no. 1 (2014): JAI: 84–91.
2. "Things to Consider: Federal Student Aid," Federal Student Aid: An Office of the US Department of Education, accessed September 26, 2016, <https://studentaid.ed.gov/sa/prepare-for-college/choosing-schools/consider#statistics>.
3. "Highest 4-Year Graduation Rates at Colleges and Universities: US News Best Colleges," US News and World Report, 2016, <http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/highest-grad-rate>.
4. Promoting Timely Graduation by Undergraduates: Twin Cities, Crookston, Morris, Rochester: UMN Policy," University of Minnesota, 2016b, Accessed September 26, 2016, <http://policy.umn.edu/education/timelygraduation>.
5. "OIR: Official New Entering Freshman Student Graduation/Retention Reports," University of Minnesota Office of Institutional Research, 2016b, http://www.oir.umn.edu/student/grad_retention/report.
6. "Graduate in Four Years," University of Minnesota, 2010, http://onestop.umn.edu/degree_planning/graduate_in_four_years.html.
7. "State Relations Updates: Government Relations; University of Minnesota," University of Minnesota, 2016, <http://govrelations.umn.edu/state/session-summary-2015.html>.
8. Ibid.
9. Ernest T. Pascarella and Patrick T. Terezini, *How College Affects Students: Findings and Insights from Twenty Years of Research* (San Francisco, CA: Jossey-Bass, 1991); Alexander W. Astin, *What Matters in College: Four Critical Years Revisited* (San Francisco, CA: Jossey-Bass, 1993); G. D. Kuh, "Student Engagement in the First Year of College," in *Challenging and Supporting the First-Year Student: A Handbook for Improving the First Year of College*, eds. B. O. Barefoot, M. L. Upcraft, and J. N. Gardner (San Francisco, CA: Jossey-Bass, 2005), http://www.ncsu.edu/uap/transition_taskforce/documents/documents/ReferenceMaterialPart3.pdf.
10. George D. Kuh and Robert M. Gonyea, "The Role of the Academic Library in Promoting Student Engagement in Learning," *College & Research Libraries* 64, no. 4 (2003): 256–82, doi:10.5860/crl.64.4.256.
11. Gary R. Pike and George D. Kuh, "First- and Second-Generation College Students: A Comparison of Their Engagement and Intellectual Development," *The Journal of Higher Education* 76, no. 3 (2005): 276–300, doi:10.1353/jhe.2005.0021.
12. Pascarella and Terezini, *How College Affects Students*.
13. V. Tinto and E. Vincent, "Classrooms as Communities," *The Journal of Higher Education* 68, no. 6 (1997): 599–623, doi:10.2307/2959965.
14. "About Us: University of Minnesota Twin Cities," University of Minnesota, accessed October 3, 2015, <http://twin-cities.umn.edu/about-us>.
15. "Fall 2015 University of Minnesota-Twin Cities Undergraduate Profile," University of Minnesota Office of Undergraduate Education, 2015, <http://undergrad.umn.edu/reports/F2015UndergraduateClassProfile.pdf>.

16. "Official Enrollment Statistics: Spring 2016," University of Minnesota Office of Institutional Research, 2016a, <http://www.oir.umn.edu/student/enrollment>.
17. "Fall 2015 University of Minnesota-Twin Cities Undergraduate Profile."
18. Ronald Huesman, Anthony K. Brown, Giljae Lee, John P. Kellogg, and Peter M. Radcliffe, "Gym Bags and Mortarboards: Is Use of Campus Recreation Facilities Related to Student Success?" *Journal of Student Affairs Research and Practice* 46, no. 1 (2009): 50–71, doi:10.2202/1949-6605.5005.
19. Shane Nackerud, Jan Fransen, Kate Peterson, and Kristen Mastel, "Analyzing Demographics: Assessing Library Use across the Institution," *portal: Libraries and the Academy* 13, no. 2 (2013): 131–45, doi:10.1353/pla.2013.0017.
20. Soria, Fransen, and Nackerud, "Library Use."
21. Soria, Fransen, and Nackerud, "Stacks, Serials, Search Engines."
22. Krista M. Soria, Jan Fransen, and Shane Nackerud, "Beyond Books: The Extended Academic Benefits of Library Use for First-Year College Students," *College & Research Libraries* 78 (January 2017): 8–22, doi:10.5860/crl.78.1.8.
23. Krista M. Soria, Shane Nackerud, and Kate Peterson, "Socioeconomic Indicators Associated with First-Year College Students' Use of Academic Libraries," *The Journal of Academic Librarianship* 41, no. 5 (2015): 636–43.
24. Felly Chiteng Kot and Jennifer L. Jones, "The Impact of Library Resource Utilization on Undergraduate Students' Academic Performance: A Propensity Score Matching Design," *College & Research Libraries* 76, no. 5 (2015): 566–86.
25. Krista M. Soria, Jan Fransen, and Shane Nackerud, "The Impact of Academic Library Resources on Undergraduates' Degree Completion" (Chicago: *College and Research Libraries*, forthcoming), <http://crl.acrl.org/content/early/2016/09/27/crl16-968.full.pdf+html>.
26. Ibid.
27. "7 Things You Should Know About IPAS," Educause Learning Initiative (ELI), 2014, <https://library.educause.edu/-/media/files/library/2014/11/eli7114-pdf>.
28. Kavitha Cardoz, "Screening Mental Health In Kindergarten Is Way Too Late, Experts Say," NPR, September 9 2016, <http://www.npr.org/sections/ed/2016/09/09/478834927/screening-mental-health-in-kindergarten-is-way-too-late-experts-say>.
29. Kuh, "Student Engagement."

References

- Astin, Alexander W. 1993. *What Matters in College: Four Critical Years Revisited*. Book. San Francisco, CA: Jossey-Bass.
- Cardoz, Kavitha. "Screening Mental Health In Kindergarten Is Way Too Late, Experts Say : NPR Ed : NPR." 2016. <http://www.npr.org/sections/ed/2016/09/09/478834927/screening-mental-health-in-kindergarten-is-way-too-late-experts-say>.
- Chiteng Kot, Felly, and Jennifer L. Jones. 2015. "The Impact of Library Resource Utilization on Undergraduate Students' Academic Performance: A Propensity Score Matching Design." Article. *College & Research Libraries* 76 (5): 566–86.
- Educause Learning Initiative (ELI). "7 Things You Should Know About IPAS." 2014. <https://library.educause.edu/-/media/files/library/2014/11/eli7114-pdf.pdf>.
- Federal Student Aid: An Office of the U.S. Department of Education. 2016. "Things to Consider | Federal Student Aid." Accessed September 26. <https://studentaid.ed.gov/sa/prepare-for-college/choosing-schools/consider#statistics>.
- Huesman, Ronald, Anthony K Brown, Giljae Lee, John P Kellogg, and Peter M Radcliffe. 2009. "Gym Bags and Mortarboards: Is Use of Campus Recreation Facilities Related to Student Success?" *Journal of Student Affairs Research*

- and Practice* 46 (1): 50–71. doi:10.2202/1949-6605.5005.
- Kuh, GD. 2005. “Student Engagement in the First Year of College.” In *Challenging and Supporting the First-Year Student: A Handbook for Improving the First Year of College*, edited by B.O. Barefoot M.L. Upcraft, J.N. Gardner, 86–107. San Francisco: Jossey-Bass. http://www.ncsu.edu/uap/transition_taskforce/documents/documents/ReferenceMaterialPart3.pdf.
- Kuh, George D, and Robert M Gonyea. 2003. “The Role of the Academic Library in Promoting Student Engagement in Learning.” *College & Research Libraries* 64 (4): 256–82. doi:10.5860/crl.64.4.256.
- Nackerud, Shane, Jan Fransen, Kate Peterson, and Kristen Mastel. 2013. “Analyzing Demographics: Assessing Library Use across the Institution.” *portal: Libraries and the Academy* 13 (2): 131–45. doi:10.1353/pla.2013.0017.
- Pascarella, Ernest T., and Patrick T. Terezini. 1991. *How College Affects Students: Findings and Insights from Twenty Years of Research*. San Francisco, CA: Jossey-Bass.
- Pike, Gary R., and George D. Kuh. 2005. “First- and Second-Generation College Students: A Comparison of Their Engagement and Intellectual Development.” *The Journal of Higher Education* 76 (3): 276–300. doi:10.1353/jhe.2005.0021.
- Soria, Krista M., Jan Fransen, and Shane Nackerud. 2013. “Library Use and Undergraduate Student Outcomes: New Evidence for Students Retention and Academic Success.” *portal: Libraries and the Academy* 13 (2): 147–64. doi:10.1353/pla.2013.0010.
- . 2017. “The Impact of Academic Library Resources on Undergraduates’ Degree Completion.” *College & Research Libraries*.
- Soria, Krista M., Shane Nackerud, and Kate Peterson. “Socioeconomic Indicators Associated with First-Year College Students’ Use of Academic Libraries.” *The Journal of Academic Librarianship* 41 (2015. 5): 636–43.
- Soria, Krista M, Jan Fransen, and Shane Nackerud. 2014. “Stacks, Serials, Search Engines, and Students’ Success: First-Year Undergraduate Students’ Library Use, Academic Achievement, and Retention.” *The Journal of Academic Librarianship* 40 (1). JAI: 84–91.
- . 2016. “Beyond Books: The Extended Academic Benefits of Library Use for First-Year College Students.” *College & Research Libraries*. Association of College & Research Libraries, crl16--844.
- Tinto, V., and E Vincent. 1997. “Classrooms as Communities.” *The Journal of Higher Education* 68 (6): 599–623. doi:10.2307/2959965.
- US News and World Report. “Highest 4-Year Graduation Rates at Colleges and Universities | US News Best Colleges.” 2016. <http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/highest-grad-rate>.
- University of Minnesota. 2015a. “About Us | University of Minnesota Twin Cities.” Accessed October 3. <http://twin-cities.umn.edu/about-us>.
- . 2016b. “Promoting Timely Graduation by Undergraduates: Twin Cities, Crookston, Morris, Rochester | UMN Policy.” Accessed September 26. <http://policy.umn.edu/education/timelygraduation>.
- . “Graduate in Four Years.” 2010. http://onestop.umn.edu/degree_planning/graduate_in_four_years.html.
- . “State Relations Updates : Government Relations : University of Minnesota.” 2016. <http://govrelations.umn.edu/state/session-summary-2015.html>.
- University of Minnesota Office of Institutional Research. “Official Enrollment Statistics: Spring 2016.” 2016a. <http://www.oir.umn.edu/student/enrollment>.
- . “OIR : Official New Entering Freshman Student Graduation/Retention Reports.” 2016b. http://www.oir.umn.edu/student/grad_retention/report.

University of Minnesota Office of Undergraduate
Education. "Fall 2015 University of Minnesota-
Twin Cities Undergraduate Profile." 2015. <http://>

[undergrad.umn.edu/reports
/F2015UndergraduateClassProfile.pdf](http://undergrad.umn.edu/reports/F2015UndergraduateClassProfile.pdf).