The Role of the Academic Library in Promoting Student Engagement in Learning[1]

George D. Kuh and Robert M. Gonyea

Abstract

This study examines the nature and value of undergraduate students' experiences with the academic library. The data represents responses from more than 300,000 students between 1984 and 2002 to the College Student Experiences Questionnaire. Though library use did not appear to make independent contributions to desirable outcomes of college, such experiences were related to other important educationally valuable activities. Because the emphasis a campus places on information literacy is a strong predictor of students becoming information literate, librarians should redouble their collaborative efforts to promote the value of information literacy and help create opportunities for students to evaluate the quality of the information they obtain.

Role of the Academic Library in Promoting Student Engagement in Learning

It's hard to imagine a college without a library. A required stop on campus tours, the library is the physical manifestation of the core values and activities of academic life. The size of the collection is used as an indicator of academic quality. Though recent years have not necessarily been kind in terms of budget support, the library's central role in the academic community has never been questioned.

Given the library's iconic status as a symbol of academic values, it is almost heretical to ask, but just what does the library contribute to student learning, broadly defined? Student learning certainly isn't the only relevant dimension on which the library's value and utility should be judged. But in the increasingly harsh light of public accountability and financial constraints, the question has never been more important or timely (Lindauer 1998; *Measuring Up* 2002). Moreover, it can't be avoided. Three major trends demand an answer. They are (1) unfettered asynchronous access to an exponentially expanding information base; (2) a shift in the focus of colleges and universities from teaching to learning; and (3) the expectation that all university functions and programs demonstrate their effectiveness.

George D. Kuh and Robert M. Gonyea are with the Center for Postsecondary Research and Planning,School of Education,Indiana University Bloomington, Bloomington, Indiana; email: kuh@indiana.edu.

Awash in Information

With unlimited access to information via the Internet, the need for and practical value of a physical repository for printed and other material are less compelling today. On average, college students spend as much time on the Internet as they do studying (Jones et al. 2002). At the same time, the information highway introduces new challenges that librarians are uniquely positioned to meet (Dunn 2002; Rockman and Smith 2002). To state the obvious, not everything available electronically is valid and reliable. In the past, knowledge gatekeepers (e.g., journal editors, publishers) and librarians determined what was worth reading and collecting. Today, students make more of these judgments on their own. Only about half of all students express confidence in being able to find good information (National Center for Postsecondary Improvement 2001) and about the same percentage admit to having difficulty in judging the quality and accuracy of what they find (Outsell, 2001). For this reason, students must develop a capacity for critical discernment to judge the quality and utility of information, during and after college. The Association of College and Research Libraries (ACRL) refers to the ability to "find, retrieve, analyze, and use information" as *information literacy*.

One cannot become information literate without first acquiring the foundational skills and competencies traditionally associated with general education – critical thinking and reasoning abilities, written and oral communication skills, and so forth (Lindauer 1998). According to Shapiro and Hughes (1996, 2):

> "Information literacy should in fact be conceived more broadly as a new liberal art that extends from knowing how to use computers and access information to critical reflection on the nature of information itself, its technical infrastructure, and its social, cultural and even philosophical context and impact - as essential to the mental framework of the educated information-age citizen as the trivium of basic liberal arts (grammar, logic and rhetoric) was to the educated person in medieval society."

To prepare librarians for the task, ACRL developed five competence standards and founded an Institute for Information Literacy (IIL) that—among other things—is assisting librarians in working with others in the educational community to promote and cultivate information literacy. One strategy is for librarians to move out from the library into classrooms where they team-teach courses with faculty colleagues from various disciplines. Most of this work takes place in lower-division courses where, for better or worse, general education skills and competencies are supposed to be emphasized. At Indiana University Purdue University Indianapolis, for example, a librarian serves on each of the four-person instructional teams (instructor, librarian, academic advisor, student mentor) that deliver the Learning Community course designed for first-year students (P. Boruff-Jones, personal communication, November 2002). At Sonoma State University, a librarian teams with the instructor of the Freshman Interest Group seminar to increase information competence (Brodsky and Toczyski 2002).

Embracing the Learning Paradigm

The shift from teaching to learning as the primary goal of undergraduate education (Barr and Tagg 1995; Tagg, in press) is gaining traction in all types of postsecondary institutions. Accreditors and policymakers are applauding this change in emphasis that promises to have profound effects on many aspects of academic life. The implications for the library are plain: students' experiences with academic libraries should make direct or indirect contributions to desired outcomes of college (Lindauer 1998; Wolff 1994). In addition to information literacy, are there other outcomes that library experiences could and should foster? The limited evidence on this point is mixed.

Powell (1992) summarized evidence that the library was related to student persistence rates and college grades. However, most of the studies on which his conclusions are based did not control for student ability or institutional factors such as selectivity. A more recent study, at Glendale Community College in California, showed that students who participated in library workshops had much higher pass rates in English and ESL classes (*Information competency improves grades*, 2001), but again, student ability was not taken into account. When factors that might influence student performance are considered the relationships between the library and student performance

are less clear. For example, Ory and Braskamp (1988) reported positive relationships between using the library and gains in critical thinking. But others, such as Terenzini et al. (1995, 1996) found negative relationships between library experiences and critical thinking scores.

The most probable explanation for the contradictory results related to critical thinking and library use is that students use library resources in different ways. To illustrate, we can divide library experiences into two types of activities (Pace 1984). One is routine, but generally tentative exploration, such as looking for information, reading assigned reference materials, and using the facility primarily to study. The second type of use, and arguably more powerful in terms of learning, is more focused exploration, analysis, and evaluation of information, driven by learner- (or collaborative work group) generated questions or, perhaps, stimulated by problems introduced by the instructor for which library resources are required to solve. Whitmire (1998) found that the latter type of activity had a significant positive effect on student self-reported critical thinking gains. These effects also appeared to be independent of key student characteristics such as race and ethnicity (Whitmire 1999).

Demonstrating the Library's Educational Value

The increasing interest from all quarters in information literacy and student learning makes it difficult to ignore the heretical question posed at the outset: To what extent do libraries today contribute to information literacy and other aspects of student learning? One way to demonstrate the library's contribution is to assess whether students' experiences with the library directly or indirectly contribute to desired outcomes of college. Using the library may also have salutary effects, such as developing an appreciation of a wide range of literature or different philosophies of life. To obtain and interpret this kind of information, librarians need to understand the conditions that foster learning and how they might independently or with others assess the outcomes associated with library experiences.

Decades of research on college student development point to two simple propositions that account for many of the more important influences on student learning. First, the more time and energy students invest in activities that are related to desired outcomes of college, the more likely they are to benefit in those areas (Astin 1984; Pascarella and Terenzini 1991). Second, educationally effective institutions design experiences that channel students' energies toward educationally purposeful activities (Education Commission of the States 1995; Kuh, Schuh, Whitt, & Associates 1991). Unfortunately, we know relatively little about what and how students' academic library experiences contribute to desired outcomes of college (including information literacy) or about the nature of the relationships between library use and college experiences that research studies show directly affect student learning, such as student-faculty interaction, writing activities, and so forth.

Purpose

This study examines the nature and value of students' experiences with the academic library. Our aim is to discover the unique contributions of library experiences (including contact with librarians) to the quality of effort students expend in other educationally purposeful activities, the gains they report making during college, and their overall satisfaction with the college experience. More specifically, we attempt to answer the following questions:

1. Has student use of various library resources changed between 1984 and 2002? That is, given the availability of information via the web and other sources, are students using the library more or less for certain reasons (for studying, for finding information)?
2. Is more frequent use of the library associated with greater gains in information literacy? What does the library contribute to other desired outcomes of college?
3. Finally, how does student use of library resources affect their engagement with effective educational practices? That is, are students who frequent the library more likely to report increased contact with faculty members inside and outside the classroom? Are they more likely to talk with peers about substantive topics such as social, political and economic issues? Serious conversations with other students may be an indicator of the extent to which a college's general education program animates lively discussions beyond the classroom and initiates debates on new topics. Moreover, the more engaged students are in these and other educationally purposeful activities, the more likely they are to more fully engage in produc-

tive activities after college, including civic participation and so on.

Methods

Instrument

The College Student Experiences Questionnaire (CSEQ) assesses the quality of effort students devote to educationally purposeful activities. As mentioned earlier, quality of effort is the single best predictor of what students gain from college (Pace 1984); thus, this measure can also be used to estimate the effectiveness of an institution or its component organizations (such as the library) in promoting student learning (Kuh 2001). Overall, the CSEQ is considered to have excellent psychometric properties (Ewell and Jones 1996; Kuh, Gonyea, Kish, Muthiah, and Thomas 2002).

The fourth edition of the CSEQ (Pace and Kuh 1998) is made up of 166 items divided into four sections. The first section (18 items) asks for information about the student's background (e.g., age, year in school, major field, parents' education) and how many hours per week they study and work on and off the campus and how they are paying for their education.

The second section includes 111 questions divided into 13 College Activities scales (including experiences with the library and computing and information technology) that measure the amount of time and energy (quality of effort) students devote to various activities. The fourth edition of the CSEQ contains both a revised library experiences scale and a computing and information technology scale that did not appear on previous editions of the instrument. The response options for these items are: 1=never, 2=occasionally, 3=often, and 4=very often. This section also includes two questions about the amount of reading and writing students do.

The third section (10 items) measures student perceptions of the extent to which their institution's environment emphasizes important conditions for learning personal development, including the importance of information literacy. Student responses are scored on a 7-point scale ranging from 7=strong emphasis to 1=weak emphasis. Three questions gauge student opinions about the quality of relationships with faculty members, administrative personnel, and other students on campus. Two additional questions measure student satisfaction.

In the final section students estimate the extent to which they have gained or made progress since starting college in 25 areas that represent desired outcomes of higher education. Response options for the 'Gains' items are: 1=very little, 2=some, 3=quite a bit, and 4=very much.

Samples

To answer the three guiding research questions we draw on two overlapping samples of students from the CSEQ Research Program at Indiana University Bloomington. The first sample is made up of more than 300,000 students from about 300 different four-year colleges and universities who completed the second, third, and fourth editions of the CSEQ over a 19-year period (1984 through 2002). The second

Table 1. CSEQ Library Experiences Scale (QELIB)[1]

In your experience at this institution during the current school year, about how often have you:

Item name	*Item*	*Response set*
LIB1	Used the library as a quiet place to read or study materials you brought with you	
LIB2	Found something interesting while browsing in the library	
LIB3	Asked a librarian or staff member for help in finding information on some topic	
LIB4	Read assigned material other than textbooks in the library (reserve readings, etc.)	1=never
LIB5	Used an index or database (computer, card catalog, etc.) to find material on some topic	2=occasionally,
LIB6	Developed a bibliography or reference list for a term paper or other report	3=often, and
LIB7	Gone back to read a basic reference or document that other authors referred to	4=very often
LIB8	Made a judgment about the quality of information obtained from the library, World Wide Web, or other sources	

[1] Cronbach's alpha = .80

Table 2. Information Literacy Scale (INFOLIT)[1]

In thinking about your college or university experience up to now, to what extent do you feel you have gained or made progress in the following areas?

Item	*Item name*	*Response set*
GNCAREER	Gaining a range of information that may be relevant to a career	
GNGENLED	Gaining a broad general education about different fields of knowledge	1=Very little,
GNCMPTS	Using computers and other information technologies	2=Some,
GNANALY	Thinking analytically and logically	3=Quite a bit,
GNSYNTH	Putting ideas together, seeing relationships, similarities, and differences between ideas	4=Very much
GNINQ_	Learning on your own, pursuing ideas, and finding information you need	

[1] Cronbach's alpha = .80

sample is composed of more than 80,000 full-time students from 131 baccalaureate degree-granting institutions who completed the fourth edition of the CSEQ between 1998 and 2002. . The background characteristics of the respondents in both samples generally mirror the population of undergraduate students attending four-year colleges and universities with a couple of exceptions. Women and White students are slightly over-represented and men, African American students and Hispanic students are under-represented.[2]

Variables of Interest

The independent variables of interest in this study are the eight items that make up the CSEQ library experiences scale (QELIB).

The scale is reliable (Table 1, Cronbach's alpha = .80), and the eight items moderately correlate with one another (ranging from .19 to .58, see appendix A).

Three outcome variables are used in this study. The first two are composed of outcomes represented by students' responses to 25 questions about how much progress they have made since starting college (1=very little, 2=some, 3=quite a bit, 4=very much). The first of these is an Information Literacy Scale (INFOLIT), which approximates the skills and competencies ACRL considers important for information literacy as reflected by student responses to six Estimate of Gain (Table 2).

The second outcome measure is GAINSUM, which is the sum of responses to all 25 Estimate of Gains items (See appendix B for the list of items) (Kuh et al. 1997). Because the 25 Gains items encompass a holistic set of outcomes in college, GAINSUM is a measure of the student's perceived overall impact of the college experience. .

The last outcome variable is satisfaction, and is composed of two CSEQ items: "How well do you like college?" and "If you could start over again, would you go to the same institution you are now attending?" Student satisfaction is widely considered an important indicator of an institution's commitment to student success and it is reasonable to expect that library experiences should contribute to this indicator.

Additional statistics for the Library Scale and the three outcome variables are listed in appendix C.

Data Analysis

To answer the first research question, "Has student use of the library changed over time?" we examined seven library experience items that were worded exactly or essentially the same on the second, third, and fourth editions of the survey, spanning the years 1984 through 2002. One exception is the second and third edition question "How often have you used a card catalogue." On the fourth edition of the CSEQ this item was changed to, "How often have you used an index or database (computer, card catalog, etc.) to find material on some topic?" We mapped student responses to this set of library experience items by charting the combined yearly percentage of students responding "often" or "very often" to each item.

To answer the second and third questions we examined the frequencies of responses to the library experiences items by gender, year in school, race and institutional type (see appendix C for frequency tables). We also conducted analysis of variance tests to determine whether groups differed significantly on their use of the library and in their self-reported gains in information literacy and other gains. Finally, we con-

ducted a series of regression analyses to examine the relationships among variables (regression tables are available from the authors).

Student characteristics and institutional characteristics can affect student collegiate experiences and outcomes (Pascarella and Terenzini 1991). For example, students majoring in the humanities (which include more women than men) may be more likely to use the library facility because the nature of their academic work requires more reading and, therefore, a greater need to obtain a variety of reference material. For this reason we dummy coded gender (women as reference group) and major field (pre-professional as reference group). We also dummy coded race and ethnicity (White as reference group) and class level (freshmen as reference group) because the success of these groups of students are of keen interest to institutions and policy makers.

The regression analyses also control for the following institutional characteristics: institutional type as defined by the 2000 Carnegie classification: doctoral/research-extensive universities, doctoral/research-intensive universities, master's colleges and universities, baccalaureate liberal arts colleges, and baccalaureate general colleges, with doctoral/research –extensive universities as the reference group); institutional selectivity (Barron's Profiles of American Colleges, 1996); and institutional control (public and private, with public institutions as reference group). The Carnegie classifications were dummy coded and entered into the models with doctoral/research-extensive universities as the reference group.

Four regression models were constructed. In the first model, the Library Experiences scale (QELIB) is the dependent variable and student and institutional characteristics are entered as control variables. Then, selected items from the CSEQ College Activities scales that are conceptually associated with library use were added to the model to determine which may account for an additional portion of variance in the Library scale. These items are use of computer and information technology, course learning activities, interactions with faculty members, writing experiences, and use of campus facilities.

The three remaining regression models examine the contribution of library experiences to three outcome measures: (1) gains in information literacy (INFOLIT), (2) overall gains in college (GAINSUM), and satisfaction with the college experience. Control variables in each model included student and institutional characteristics, perceptions of the campus environment, and the academic challenge scale (see appendix D). We controlled for academic challenge because students at institutions that have high performance expectations for academic work are more likely to use the library. Finally, the library activity items were added to the regression to see if they would explain additional variance in the outcome measure.

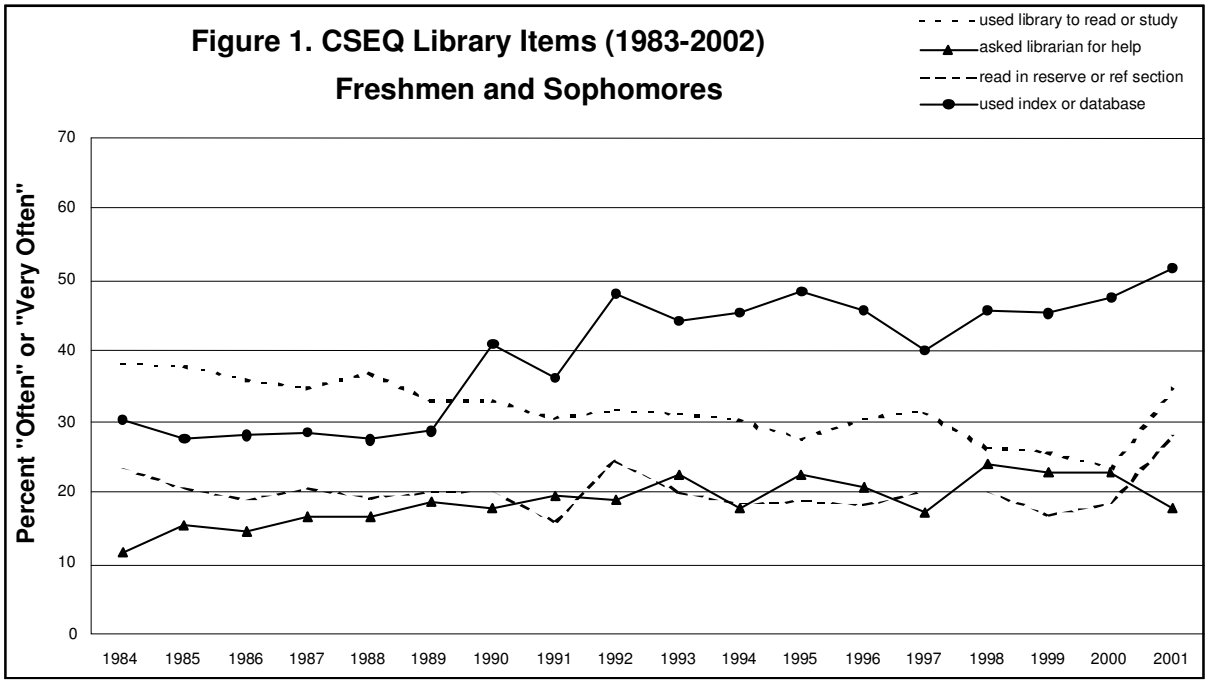
In reporting the regression results, we will focus only on those findings that are both statistically significant and have reasonable effect sizes. That is, our objective is to identify library experiences that have practical implications as well as statistical significance (Cohen 1988). To do this we computed Y-standardized effect sizes by dividing the unstandardized coefficient by the standard deviation for the dependent variable (Light and Pillemer 1982). For this study, effect sizes greater than |.08| were considered reasonable and worthy of our attention because they represent potentially important relationships between library experiences, gains from college (including information literacy), and student satisfaction.

Results

Trend Analysis

Figures 1 and 2 depict the proportions of first-year and sophomore students (combined) and juniors and seniors (combined) that responded "often" or "very often" to four selected library experiences between 1984 and 2002. These activities are: (1) used the library to read or study, (2) asked a librarian for help, (3) read in the library's reserve or reference section, and (4) used an index or database. These four experiences showed the greatest changes over the 19-year period, with the other four library experiences being generally stable. Because different students and institutions participate in a given year, year-to-year deviations from the trend line are common. Nevertheless, the overall multi-year trends probably reflect meaningful changes over time.

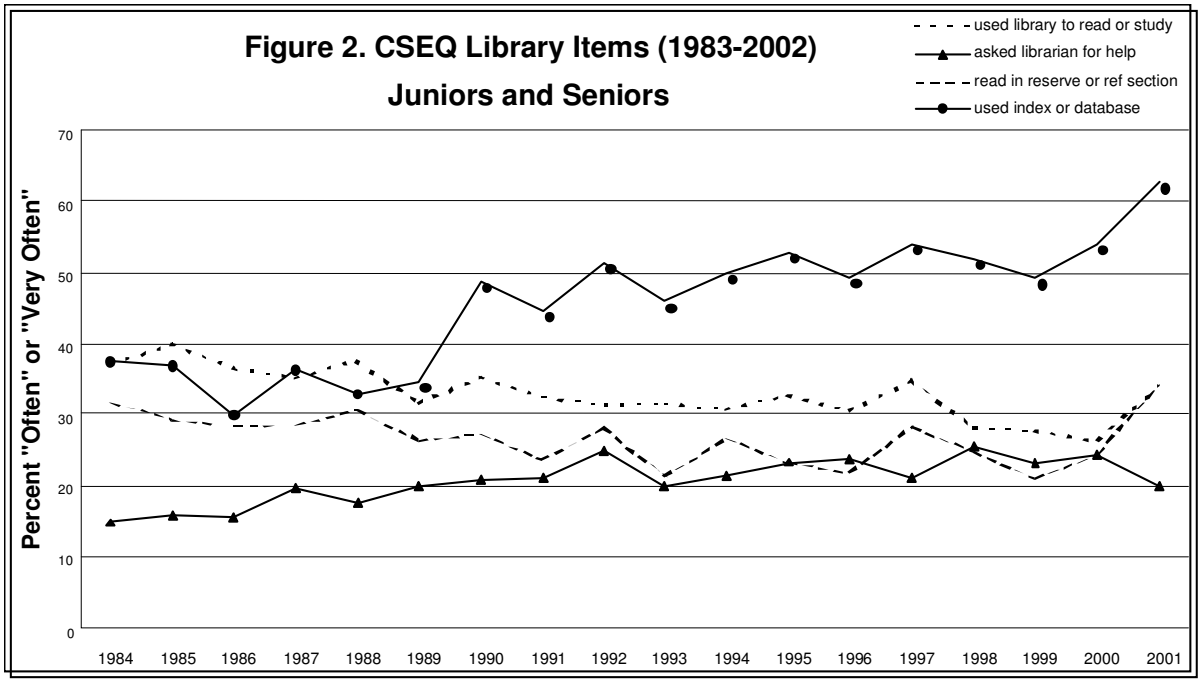
Two trends stand out. First, greater numbers of students are using indexes and databases to find information. This likely reflects the rapid and expansive deployment and use of computers and information technology during the past decade that



makes more information accessible to more people as well as easier to navigate. To illustrate, in the mid-1980s only about 30 percent of first-year and sophomore students said they frequently used indexes or databases.

Beginning in the early 1990s this percentage jumped to close to half. Juniors and seniors showed similar increases, from about 38 percent in the 1980s to over 60 percent by 2001.

The second trend is the decline in the proportion of students who use the library as a place to read or study. This is probably due to the explosion of the World Wide Web in the mid-1990s (I. Rockman, personal communication, December 19, 2002), mak-



ing it possible for many students to access information and library resources online from their dorm rooms, fraternity and sorority houses, other campus locations, and off-campus residences. Another factor may be the availability of additional campus venues where students can do academic work such as computer labs, academic support centers, and study lounges in campus unions or residence halls. These locations may be especially attractive to commuter students if parking near the library is problematic.

A less definitive trend is a slight increase in the number of students asking a librarian for help during the 1980s and early 1990s. Librarians about this time began to offer instructional workshops and guidance about how to use the web (I. Rockman, personal communication, December 19, 2002). Another factor may have been the involvement of librarians in student success programs, such as orientation and first-year student seminars. This behavior begins to fluctuate a bit more from the mid-1990s on, perhaps because librarians were more or less involved in such efforts at the different schools participating in various years. What we can't tell from these data is whether the nature of the requests of librarians made by students changed through time. For example, are students more frequently asking librarians for technical assistance with online databases and search engines? Or are students asking for assistance in finding materials contained in the library building?

Frequency of Library Use

Examination of students' library experiences show some interesting differences by class, race, major category, and by institutional type (appendix E). These differences are supported by the ANOVA tests (these results are not reported in this paper but are available from the authors). On balance, as students move through the college years they become more information literate each year (a finding corroborated by Jones et al. 2002). For example, each successive year from first-year to senior shows a significant increase in the frequency of library use. That is, more seniors frequently make judgments about information quality (43%) compared with first-year students (34%); fewer seniors compared with first-year students (18% and 26% respectively) say they "never" do this.

Hispanic and Latino/a students and Black students are more frequent users of library resources, while White students use libraries the least. Students majoring in humanities and social sciences are, as expected, the most frequent users of the library, as well as students who report two or more majors. Students majoring in business and math and science, and those who are undecided in terms of major, score the lowest on the library scale. Finally, students attending baccalaureate liberal arts colleges use the library more often while those attending baccalaureate general colleges and doctoral/research-extensive universities do so least often. In the next section we report whether or not these differences hold up after controlling for student and institutional variables simultaneously.

Regression Results

The first regression model uses the library experiences scale (QELIB) as the dependent variable to answer the question "Who uses the library most?" After controlling for student and institutional characteristics, students of color use the library more frequently compared with White students (appendix F); students in the humanities and pre-professional majors use the library more than students majoring in business and in math or science. Access to computing and information technology is negatively related to library use and shows a relatively large effect size (.17); that is, students who do not have a computer where they live or work (or nearby) tend to use the library more. Perhaps for these students, the library is one place where they can use a computer which, in turn, allows them to access databases and obtain information from other libraries.

All things considered, students at doctoral/research-extensive universities use the library less frequently compared with students attending the other four types of institutions.

Academic challenge is positively related to library use. Of the 11 academic challenge items (appendix D), five have effect sizes greater than 0.08. These include three items related to course learning experiences (put together different facts and ideas, worked on projects integrating ideas from various sources, and applied class material to other areas in life) and two student-faculty interaction items (worked harder than you thought you could to meet faculty expectations and worked harder due to instructor feedback). In addition, all other items in the scale show statistically significant differences, al-

though with smaller effect sizes.

The results from the three regression models predicting desired college outcomes—gains in information literacy, overall gains in college, and satisfaction—are reported in appendix G. Taken together, these models indicate that none of the individual library activities appears to have a substantial influence on any of the three outcome variables, after controlling for student and institutional characteristics, perceptions of the environment, and academic challenge.

The outcome variable represented in the first regression is information literacy (appendix G). In this model, transfer students and first-year students make the least progress in information literacy. For first year students, this is surely due to the small amount of time they have been in college. For transfer students, the finding is more difficult to interpret and is cause for concern if this sizeable fraction of students is not gaining as much as other students in this important area. Though students majoring in math and science do not use the library as much as their peers, they report gaining more in information literacy relative to pre-professional majors. Humanities majors gain less in information literacy (relative to pre-professional majors), after controlling for other factors. Students at doctoral/research extensive universities report the greatest gains in information literacy, followed by students at baccalaureate general colleges, doctoral/research intensive universities, and baccalaureate liberal arts colleges. Finally, as expected, students who perceive that their institution places a strong emphasis on acquiring information literacy skills report higher gains in information literacy. These results were also confirmed by the ANOVA tests.

The model predicting overall gains tells a somewhat different story. Women and transfer students report making less progress during college, after controlling for other student and institutional characteristics. African American and Hispanic/Latino/a students report greater gains than White students. In terms of institutional type, students at baccalaureate liberal arts and baccalaureate general colleges report lower gains relative to students in doctoral/research-extensive universities. The satisfaction model produced no significant relationships.

In summary, frequency of library use varies depending on the type of student and the type of institution. The least frequent library users are White students, math and science majors, those who have ready access to a computer, and those who are attending doctoral-extensive universities. Those who use the library more frequently report a higher degree of academic challenge. On balance, library experiences do not seem to be directly related to information literacy, overall gains in college, or satisfaction with the college experience.

Discussion

The results of this study indicate that student use of the library has changed over time. This is not surprising, given the now near-universal access college students have to computing and information technology. Nonetheless, these data corroborate anecdotal reports and other studies (Jones et al. 2002). More important, student contact with librarians has increased somewhat during this period, suggesting that librarians may be becoming more visible and accessible to larger numbers of students. This seems to be in part a function of students needing help in finding good information and making judgments about the quality of the information they do find (Dunn 2002; Rockman and Smith 2002), and is supported by the relatively high correlations produced in this study between "asked a librarian" and other behaviors such as "used index or database," "found something interesting while browsing," and "developed a bibliography for a term paper." At the same time, almost one-fifth of all seniors say they never made judgments about the quality of the information they obtain for use in the academic work. This is an unacceptably high number of students about to graduate from college who by their own report are underprepared to live and work in an information-rich world.

Smallness begets distinctiveness in American higher education (Clark 1970; Kuh and Whitt 1988; Townsend, Newell, and Wiese 1992). This appears to be the case for the library as well, as the character of experiences with academic libraries at small, academically challenging baccalaureate liberal arts colleges sets them apart from other types of institutions. For example, more students at baccalaureate liberal arts colleges (40%) say they frequently make judgments about the quality of the material than at any other type of institution (33% doctoral/research-extensive universities; 37% doctoral/research intensive

universities; 34% master's institutions, and 33% baccalaureate general colleges) (appendix E). In addition, library experiences at the baccalaureate liberal arts colleges were more strongly correlated with one another and with other educationally purposeful activities, such as working with a faculty member on research or discussing papers with faculty members. One obvious explanation for this is that because most of these institutions are residential in nature, the library is in close proximity to where students live making access much easier. In contrast, library use is least frequent at larger doctoral/research-extensive universities. In part, this may be because of the array of alternate academic support venues such institutions provide, such as computer labs and academic skills centers. Having these options possibly mutes the impact of the academic library on many of the outcomes measures and reduces the necessity that a student must use the library for these vital academic services. In addition, research institutions are also more likely to be better wired for technology—with broadband access to computer networks, excellent library search engines online, network access in residence hall rooms, and so on.

Academic Challenge Matters

Size and selectivity are not the only factors that influence library use. Academic challenge also is important. That is, institutions that set high standards for academic work seem to impel students to actively use a variety of intellectual resources, including the library. As a result, students who frequently use library resources are also more likely to work harder than they thought they could to meet a faculty member's expectations and in response to instructor feedback, and they are assigned projects that require integrating ideas, putting different facts and ideas together, and applying class material to other areas in life. In addition, students at academically challenging institutions are more likely to ask a librarian for help, use indexes and databases, and make thoughtful judgments about the quality of information they receive. At the same time, using the library does not appear to be associated with the amount of effort students put forth on their own in many other learning activities, such as the amount of effort they put forth in writing or the frequency with which they converse about substantive matters with peers.

The Library's Contribution to Student Success

On balance, the results of this study indicate that libraries play an important supporting role in helping the institution achieve its academic mission. It's particularly gratifying that students of color generally use the library as much or more than do other students, especially African American, Asian and Pacific Islander, and Hispanic/Latino/a students. Perhaps students of color find the academic library to be a safe haven, a place that supports and nurtures academic success in collaboration with peers of the same racial and ethnic background, much in the same way the campus union provides a venue for social gatherings. If so, the library is providing a very valuable service for a subset of undergraduates that is increasing in number.

The most surprising (and mildly disappointing) finding is that library experiences do not seem to directly contribute to gains in information literacy, to what students gain overall from college (GAINSUM), or to student satisfaction. There are three plausible explanations for this. First, the information literacy scale derived from the CSEQ scales may not be a valid proxy; that is, other measures may more accurately estimate information literacy as defined by the ACRL. Second, the lack of baseline measures for information literacy and the other gains makes it difficult to draw conclusions from student self-reported estimates of their gains (Pascarella 2001). For example, students at different colleges or who are majoring in different fields may start college at different levels of information literacy. Some students who report gaining relatively little may have been fairly information literate when they started college. Other students who say they gained a good deal may have started college with a lower level of literacy. So, while the latter group may have, indeed, gained a substantial amount during college, their actual level of information literacy may be the same as, or even lower than, their peers who reported making less progress in the area since beginning college. This same caveat holds for the overall gains measure (GAINSUM). Finally, as with most other desired outcomes, a variety of experiences during college, inside and outside of class, contribute to gains and satisfaction, not just one type of experience. That is, critical thinking is not primarily or exclusively cultivated in the classroom; rather it is the result of cumulative experiences over time in a variety of venues (Pascarella and Terenzini 1991). There is

no reason to expect that the relationship between library experiences and gains in information literacy or other areas would be different. Indeed, the findings of this study indicate that there is no silver bullet (or single intervention) that will produce an information literate college graduate.

For example, students who report higher levels of information literacy were attending institutions that emphasized the importance of information literacy and encouraged students to use computers and other information resources. They were also assigned a good deal of reading, including some basic references that are more likely to be found either in the library or online. In addition, students who gained the most in information literacy also reported that they were expected to make judgments about the quality of the information they obtained. In other words, students who make the greatest gains in information literacy attend institutions that communicate the importance of information literacy and engage in activities and practice the skills that lead to information literacy.

Implications for Practice and Additional Research

This brings us to one of the more important findings from this study: students who perceive that their campus emphasizes information literacy gain more in this area, net of other influences. This underscores the need to collaborate with classroom instructors and student affairs professionals in making certain students receive clear and consistent messages about the value of learning about various sources of information, requiring evidence that students are making discerning judgments about the quality of the information they are using, and, equally important, giving students feedback on the quality of these judgments. Anecdotal experience suggests that students are more likely to critically evaluate the quality of sources when instructors explicitly require them to do so (Carolyn Walters, personal communication, December 22, 2002). This suggests that if institutions are serious about students becoming information literate they should include learning experiences that demand students practice and demonstrate their competence. Librarians can work with faculty members in designing library-based activities, consistent with course learning objectives, that require students to evaluate the quality of various pieces of information and be available to provide feedback to students in the process. The University of California at Berkeley is an example of this where the Teaching Library and the departments of political science and sociology are designing a graduated program of instruction across the undergraduate years that will require students to use information resources (Maughan 2002). Librarians might also partner with student affairs staff to help them identify ways to identify students who may be struggling with using information appropriately and responsibly.

A reasonable amount of interaction with knowledgeable adults on a college campus is very important to student learning. These interactions are especially valuable when they focus on substantive or course content matters (Kuh and Hu 2001). Transfer students are one group of students that would benefit from more attention in this regard. At least 40 percent of seniors attending four-year colleges and universities started college at a school other than the one from which they are about to graduate (Kuh, in press). Yet they are generally less engaged in educationally purposeful activities than their native student counterparts. It's difficult to reach transfer students directly, as they are not concentrated in living units or certain courses. Perhaps librarians could partner with academic departments to explore ways to induce transfer students to use the library more frequently and to help them attain levels of information literacy comparable to students who start and graduate from the same college. The California State University system has recognized this need and its 23 campuses are partnering with community colleges well as high schools to improve information literacy (Information Competency Project 2002).

More investigations are needed into the library's effectiveness in promoting student learning. One fruitful line of inquiry would be to determine the kinds of student interactions with librarians beyond those represented on the CSEQ effectively promote learning or affect other aspects of the college experience. The CSEQ does not ask about whether students made effective use of what they learned in a session focused on information literacy facilitated by a librarian; answers to this and related questions would be very instructive in terms of the library's contribution. An especially important question is determining which approaches are most effective in teaching information literacy. Are these skills and competencies best cultivated through a freestanding course, or sprinkled

throughout the curriculum, or learned in the context of the discipline or a specific topic? Other research indicates that students learn what they study. It would be instructive to compare the information literacy levels of students at institutions that require library assignments as part of one or more courses with those that do not.

Another research question is whether student use of the library and interactions with librarians are associated with persistence and graduation, net of other factors. Previous research suggested that library experiences were positively related to persistence and student achievement. Most of this research is dated, however, and did not employ advanced statistical methods that controlled for student ability or institutional selectivity.

A time-honored improvement strategy in higher education and other sectors is to identify high-performing organizations, find out what they do well, and adapt these promising practices for use in other settings. For example, some institutions have higher-than-predicted graduation rates and student engagement levels (Kuh, in press). Perhaps students at certain colleges and universities use the library more and benefit more than might be predicted, all things being equal. It would be instructive to learn more about these institutions and their libraries.

Limitations

This study is limited in that the data are from colleges and universities that voluntarily administered the CSEQ. If data from other institutions were included the findings might change in unknown ways. Another factor that could affect the results is if additional student-level measures (e.g., ability, motivation) and institution-level data (e.g., resources) were included in the models. There is also the possibility that, as mentioned earlier, students use different baselines when reporting gains (Pascarella 2001). Despite these limitations, the CSEQ research program represents one of the most extensive national databases with survey information from college students related to their quality of effort and gains from college. It is one of the few available sources of information from multiple institutions about the undergraduate experience that can be used to examine the influence of the library on information literacy and other aspects of student learning and personal development.

Conclusion

The results of this exploratory study indicate that the library experiences of undergraduates are related to select educationally purposeful activities, such as using computing and information technology and interacting with faculty members. Those students who more frequently use the library reflect a studious work ethic and engage in academically challenging tasks that require higher order thinking. Though certain student background characteristics (e.g., race, major, year in school, transfer status, access to computers) affect the nature and frequency of students' library activities, the library appears to be a positive learning environment for all students, especially members of historically underrepresented groups.

At the same time, library use does not appear to directly contribute to gains in information literacy and other desirable outcomes. This is not surprising, as rarely does any single experience or set of activities during college affect student learning and personal development one way or the other; rather, what is most important to college impact is the nature and breadth of a student's experiences over an extended period of time.

Academic librarians are well positioned to provide leadership and expertise to outcomes associated with information literacy. But they cannot do this alone. The findings of this study indicate that it takes a whole campus to produce an information literate college graduate. For this reason, librarians would do well to re-double their efforts to collaborate with faculty members and student affairs professionals in promoting the value of information literacy in various in-class and out-of-class activities and provide students with as many opportunities as possible to evaluate the quality of the information they encounter, on and off the campus.

Notes

1. This paper was originally prepared for an invited session at the 2003 ACRL National Conference. We thank Ann Bristow, Polly D. Boruff-Jones, Ilene Rockham, and Carolyn Walters for their comments and suggestions on an earlier draft of this paper.

2. The respondents in the first sample who completed the CSEQ between 1984 and 2002 include 60% women; 80% are White, 6% Black, 3% Hispanic, 6% Asian, and 4% other race or ethnicity. First-year students total 35%, sopho-

mores 21%, juniors 17%, and seniors 26%. Of the respondents in the second sample who completed the 4th edition of the CSEQ 61% were women and 77% were White, 8% Asian or Pacific Islander, 5% African American, 3% Mexican-American, Puerto Rican, or other Hispanic, 1% American Indian, 3% multiracial, and 3% other race or ethnic identity. Approximately 43% were first-year students, 20% sophomores, 17% juniors, and 20% seniors. About 20% were majoring in a preprofessional program (e.g., agriculture, education, communications, and health-related fields), 11% in social sciences (e.g., multidisciplinary studies, sociology, and public administration), 16% in mathematics, science, or related area (e.g., computer science and engineering), 8% in the humanities (e.g., ethnic studies, foreign languages, history, and visual and performing arts), and 15% in business. Four percent were undecided as to major field and 21% had two or more majors. In terms of institutional type, 38% percent were from 29 doctoral/research-extensive universities, 13% from 17 doctoral/research-intensive universities, 33% from 41 masters' colleges and universities, 8% from 21 baccalaureate liberal colleges, and 9% from 23 baccalaureate general colleges (Carnegie Foundation for the Advancement of Teaching 2000).

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Appendix A

CSEQ Library Scale Inter-Item Correlation Coefficients

		LIB1	LIB2	LIB3	LIB4	LIB5	LIB6	LIB7	LIB8
LIB1	Used the library to study								
LIB2	Found something interesting browsing	.37							
LIB3	Asked a librarian/staff member for help	.19	.31						
LIB4	Read assigned material not texts	.40	.39	.30					
LIB5	Used index or database to find material	.26	.39	.38	.38				
LIB6	Wrote bibliography for a term paper	.21	.27	.33	.32	.58			
LIB7	Gone back to read basic reference	.26	.37	.28	.36	.36	.43		
LIB8	Made a judgment about quality of info.	.21	.31	.23	.27	.42	.44	.39	

Item-total correlations range from .40 to .62 indicating that each item contributes substantially to the scale.

Appendix B

CSEQ Gain Scales and Items

(Cronbach's alpha = .92; item-total correlations range from .39 to .68

1. *General Education*
- Understanding and enjoyment of art, music, drama
- Acquaintance with and enjoyment of literature
- Knowledge of history
- Knowledge about different parts of the world and people
- Awareness of different philosophies, cultures, ways of life
- Broad general education

2. *Personal Development*
- Values and ethical standards
- Self-understanding
- Ability to get along with others
- Teamwork skills
- Good health habits and physical fitness

3. *Science and Technology*
- Science and experimentation
- Science and technology developments
- Consequences of science and technology

4. *Vocational Preparation*
- Job or work skills
- Background for further education
- Career information

5. *Intellectual Development*
- Writing
- Presenting and speaking
- Computers and other information technologies
- Analytical and logical thinking
- Quantitative problem solving
- Synthesis ability
- Self-directed learning
- Adapting to change

6. *Information Literacy*
- Information relevant to a career
- Broad general education
- Computers and other information technologies
- Analytical and logical thinking
- Synthesis ability
- Self-directed learning

Appendix C

Descriptive Statistics for Dependent Variables Used in the Study

Measure	Valid N	Missing N	% Missing	Mean	S.E.M.	Std. Dev.	Skewness	Kurtosis
QELIB	78425	1844	2%	17.0	0.02	4.6	0.37	0.08
INFOLIT	76987	3282	4%	17.7	0.01	3.5	-0.29	-0.25
GAINSUM	75103	5166	7%	67.8	0.05	13.1	-0.07	-0.14
OPINSCOR	78487	1782	2%	6.3	0.01	1.5	-0.76	0.19

All four scales have a minimal percentage of missing values and good normal curve properties as indicated by skewness and kurtosis values in the normal range (between -1 to +1).

Appendix D

CSEQ Academic Challenge (CHAL) Scale[1] Items

Item name	*Item*	*Response set*
STUDIES4[2]	Hours per week on out of class academic work	1=Up to 5, 2=6-10, 3=11-15, 4=16-20, 5=21-25, 6=26-30, 7=30+
READTXT4[2]	Number of texts read	1=none, 2=fewer than 5, 3=between 5 and 10, 4=between 10 and 20, 5=more than 20
READPAK4[2]	Number of course packets read	
WRITTRM4[2]	Number of term papers written	
COURSE5	Put together different facts and ideas	1=never, 2=occasionally, 3=often, and 4=very often
COURSE11	Worked on project integrating ideas	
COURSE8	Applied class material to other areas	
FAC9	Worked to meet faculty expectations	
FAC5	Worked harder due to instructor feedback	
ENVSCH4[2]	Emphasis on developing academic, scholarly, and intellectual qualities	7=strong emphasis to 1=weak emphasis
ENVCRIT4[2]	Emphasis on developing critical, evaluative, and analytical qualities	

[1] Cronbach's alpha = .74

[2] Response values mathematically collapsed to four-point range giving all nine items an equal portion of the total scale score.

Appendix E

Frequencies to Library Experience Items by Sex, Class, Race, and Institutional Type

Frequency of Responses to CSEQ Library Experiences Items by Sex		**male**	**female**
	Response Options	*Col%*	*Col%*
Used the library to study	Never	24.6	23.3
	Occasionally	46.2	48.7
	Often	17.5	16.8
	Very often	11.6	11.2
Found something interesting browsing	Never	33.5	36.2
	Occasionally	45.7	47.2
	Often	14.7	11.6
	Very often	6.2	4.9
Asked a librarian/staff member for help	Never	29.9	23.0
	Occasionally	49.7	52.6
	Often	15.6	18.0
	Very often	4.8	6.4
Read assigned material not texts	Never	32.5	31.2
	Occasionally	45.1	44.3
	Often	16.4	17.4
	Very often	6.0	7.1
Used index or database to find material	Never	13.3	9.1
	Occasionally	39.9	34.1
	Often	30.0	33.0
	Very often	16.9	23.8
Wrote bibliography for a term paper	Never	20.9	16.8
	Occasionally	40.4	34.2
	Often	25.8	28.6
	Very often	13.0	20.5
Gone back to read basic reference	Never	53.9	58.3
	Occasionally	34.0	30.6
	Often	8.7	7.6
	Very often	3.4	3.6
Made a judgment about quality of info.	Never	24.3	22.6
	Occasionally	39.5	41.0
	Often	23.7	24.0
	Very often	12.6	12.4

Appendix E cont.

Frequencies to Library Experience Items by Sex, Class, Race, and Institutional Type

Frequency of Responses to CSEQ Library Experiences Items by Class		First-year	Sophomore	Junior	Senior
	Response Options	*Col%*	*Col%*	Col%	Col%
Used the library to study	Never	25.5	21.6	22.6	23.3
	Occasionally	47.8	47.6	47.0	48.5
	Often	16.5	17.9	17.7	16.9
	Very often	10.1	12.9	12.7	11.3
Found something interesting browsing	Never	39.2	34.7	32.1	29.6
	Occasionally	44.9	46.8	48.6	48.4
	Often	11.6	13.1	13.3	14.7
	Very often	4.3	5.4	6.0	7.3
Asked a librarian/staff member for help	Never	28.4	26.1	25.0	19.9
	Occasionally	48.4	52.4	53.0	55.9
	Often	17.4	16.1	16.4	18.0
	Very often	5.8	5.4	5.7	6.2
Read assigned material not texts	Never	37.4	29.2	28.8	24.3
	Occasionally	42.0	46.3	45.0	48.3
	Often	15.1	17.3	18.0	19.9
	Very often	5.5	7.1	8.2	7.5
Used index or database to find material	Never	12.9	10.2	9.9	7.3
	Occasionally	37.1	38.7	35.6	33.0
	Often	30.8	31.9	32.2	33.4
	Very often	19.2	19.2	22.3	26.3
Wrote bibliography for a term paper	Never	20.9	18.4	17.0	13.9
	Occasionally	35.7	39.8	37.3	34.7
	Often	26.8	27.0	28.2	28.6
	Very often	16.5	14.8	17.5	22.8
Gone back to read basic reference	Never	61.1	58.1	54.0	47.5
	Occasionally	29.0	31.8	33.8	36.5
	Often	7.2	7.4	8.1	10.5
	Very often	2.8	2.8	4.1	5.5
Made a judgment about quality of info.	Never	25.7	23.7	21.7	18.7
	Occasionally	40.2	41.5	40.3	39.9
	Often	22.8	23.4	24.5	26.2
	Very often	11.3	11.4	13.5	15.3

Appendix E cont.

Frequencies to Library Experience Items by Sex, Class, Race, and Institutional Type

Frequency of Responses to CSEQ Library Experiences Items by Race and Ethnicity		Asian, Pacific Islander	Black, African American	White, Caucasian	Mexican-American, Puerto Rican or Other Hispanic	Other Race
	Response Options	*Col%*	*Col%*	Col%	Col%	Col%
Used the library to study	Never	14.7	21.4	25.3	18.6	22.3
	Occasionally	45.5	47.2	48.3	46.9	46.9
	Often	21.6	18.2	16.3	19.3	17.8
	Very often	18.2	13.2	10.2	15.2	13.1
Found something interesting browsing	Never	30.1	27.4	36.9	29.1	30.9
	Occasionally	48.7	46.6	46.5	44.8	46.7
	Often	14.3	19.1	11.8	17.9	15.3
	Very often	6.9	7.0	4.9	8.2	7.1
Asked a librarian/staff member for help	Never	27.4	17.6	26.1	25.1	24.7
	Occasionally	53.3	48.1	51.9	47.5	49.5
	Often	14.7	23.7	16.7	19.2	18.1
	Very often	4.6	10.7	5.3	8.2	7.6
Read assigned material not texts	Never	28.7	28.7	32.4	29.0	30.7
	Occasionally	46.2	42.9	44.9	42.4	43.0
	Often	17.0	19.5	16.6	20.1	17.7
	Very often	8.1	9.0	6.1	8.5	8.6
Used index or database to find material	Never	11.7	10.2	10.6	10.5	10.9
	Occasionally	37.0	32.6	36.8	34.9	34.2
	Often	30.8	31.3	32.0	31.0	31.3
	Very often	20.5	25.9	20.6	23.6	23.6
Wrote bibliography for a term paper	Never	20.2	18.5	18.0	18.6	19.4
	Occasionally	39.9	33.5	36.6	35.2	35.3
	Often	24.6	27.5	27.8	27.4	27.3
	Very often	15.3	20.5	17.6	18.8	18.1
Gone back to read basic reference	Never	50.9	49.1	58.3	49.3	54.0
	Occasionally	35.4	35.0	31.1	34.9	32.2
	Often	9.8	10.9	7.4	10.3	9.3
	Very often	3.9	5.0	3.2	5.5	4.4
Made a judgment about quality of info.	Never	25.4	26.8	22.8	22.5	23.1
	Occasionally	39.3	37.3	41.3	37.3	37.1
	Often	23.7	22.7	23.8	25.8	24.2
	Very often	11.6	13.1	12.1	14.4	15.6

Appendix E cont.

Frequencies to Library Experience Items by Sex, Class, Race, and Institutional Type

Frequency of Responses to CSEQ Library Experiences Items by Carnegie Classification		Doctoral - Extensive	Doctoral - Intensive	Master's	Liberal Arts Colleges	General Colleges
	Response Options	*Col%*	*Col%*	Col%	Col%	Col%
Used the library to study	Never	22.9	24.1	25.5	14.8	28.9
	Occasionally	47.1	47.4	48.9	46.3	48.1
	Often	17.3	17.0	16.4	20.8	15.1
	Very often	12.7	11.5	9.1	18.1	7.9
Found something interesting browsing	Never	38.0	32.3	35.0	23.7	38.4
	Occasionally	45.5	42.8	48.4	50.4	46.6
	Often	11.4	16.0	12.5	17.4	11.1
	Very often	5.1	8.9	4.1	8.6	3.8
Asked a librarian/staff member for help	Never	29.5	23.5	23.0	23.0	24.6
	Occasionally	51.4	48.2	51.8	56.2	51.1
	Often	14.5	19.5	19.1	16.1	18.3
	Very often	4.6	8.8	6.1	4.7	6.1
Read assigned material not texts	Never	33.3	31.7	32.5	17.0	35.1
	Occasionally	43.9	43.7	45.9	44.5	44.7
	Often	16.1	17.4	16.5	24.6	15.4
	Very often	6.7	7.2	5.2	13.9	4.8
Used index or database to find material	Never	11.6	10.2	10.4	5.6	14.0
	Occasionally	37.6	34.1	36.2	30.4	40.5
	Often	30.8	33.2	32.7	33.8	28.8
	Very often	20.1	22.5	20.8	30.2	16.7
Wrote bibliography for a term paper	Never	20.7	19.3	17.3	12.0	16.3
	Occasionally	37.9	35.7	35.9	33.8	37.5
	Often	25.2	27.6	29.4	29.5	27.7
	Very often	16.1	17.4	17.4	24.8	18.4
Gone back to read basic reference	Never	58.1	55.9	58.1	44.5	56.2
	Occasionally	30.9	31.7	30.9	39.0	33.2
	Often	7.6	8.6	7.8	10.7	7.4
	Very often	3.4	3.8	3.1	5.8	3.2
Made a judgment about quality of info.	Never	24.1	24.0	23.3	16.4	24.3
	Occasionally	39.0	39.7	42.3	38.9	41.4
	Often	23.8	23.9	23.4	27.1	23.4
	Very often	13.1	12.4	11.0	17.6	10.9

Appendix F

Variables with Significant and Reasonable Effects on the Library Experiences Scale[1]

Independent Variables			**Effect Size[2]**
Student Characteristics	Race and ethnicity (White as reference group)	African American	0.17
		Asian, Pacific Islander	0.15
		Hispanic or Latino/a	0.16
		Other race or ethnicity	0.09
	Major Categories (Pre-professional as reference group)	Math and Science	-0.12
		Humanities	0.08
		Social Sciences	
		Business	-0.09
		Undecided	
		Two or more majors	
	Year in school (First-year students as reference group)	Sophomore	
		Junior	0.08
		Senior	0.14
	Transfer status (1=transfer, 0=non-transfer)		-0.09
	Access to a computer (1=yes, 2=no)		0.17
	Expect to enroll for an advanced degree (1=yes, 2=no)		0.11
Institutional Characteristics	Carnegie classification (Doctoral-Extensive as reference group)	Doctoral-Intensive	0.24
		Master's	0.18
		Liberal Arts Colleges	0.21
		General Colleges	0.10
Academic Challenge Scale Items	STUDIES	Hours out-of-class academic work	
	READTEXT	Number of texts read	
	READPAK	Number of course packets read	
	WRITTRM	Number of term papers written	
	COURSE5	Put together different facts and ideas	0.08
	COURSE11	Worked on project integrating ideas from various sources	0.19
	COURSE8	Applied class material to other areas in life	0.08
	FAC9	Worked harder than thought to meet faculty expectations	0.10
	FAC5	Worked harder due to instructor feedback	0.11
	ENVSCH	Environmental emphasis on scholarly, academic and intellectual qualities	
	ENVCRIT	Environmental emphasis on developing critical, evaluative, and analytical qualities	

[1] N = 69,923; R^2=.25

[2] *Y-standardized effect size (unstandardized B coefficient divided by the standard deviation of the dependent variable).*

Appendix G

Predictors of Three Outcome Variables from the CSEQ

(Only Y-standardized effect sizes greater than |.08| are shown)				
		Outcome Variables		
Category	**Variable**	**Information Literacy**	**Overall Gains Score**	**Satisfaction with College Experience**
Student Characteristics	Age			
	Sex (0=male, 1=female)		-.08	
	Transfer Status	-.09	-.08	-.09
	Grades at this college			.09
	Expect to enroll for an advanced degree			
	First generation student			
Race and Ethnicity	African American		.11	-.27
	Asian, Pacific Islander			-.29
	Hispanic or Latino/a		.12	
	Other race or ethnicity			-.08
Major Category	Math and Science	.16	.15	
	Humanities	-.09		
	Social Sciences			
	Business			
	Undecided			-.15
	Multiple Majors			
Class Standing	Sophomore	.21	.25	
	Junior	.30	.33	
	Senior	.34	.39	-.11
Institutional Characteristics	Barrons selectivity code			
	Control (0=public, 1=private)			
Institution Type	Doctoral-Intensive	-.13		-.14
	Master's I and II	-.09		-.20
	Baccalaureate Liberal Arts	-.15	-.10	-.23
	Baccalaureate General	-.11	-.10	-.32
Perceptions of Environment	Env. Emphasis: Aesthetics			
	Env. Emphasis: Diversity			
	Env. Emphasis: Info. literacy skills	.13		
	Env. Emphasis: Vocational			
	Env. Emphasis: Practical courses			
	Relationships: Other students			.21
	Relationships: Administrative personnel			
	Relationships: Faculty members			
Academic Challenge	CSEQ Academic Challenge Scale			
Library Experiences	Used the library to study			
	Found something interesting browsing			
	Asked a librarian/staff member for help			
	Read assigned material not texts			
	Used index or database to find material			
	Wrote bibliography for a term paper			
	Gone back to read basic reference			
	Made a judgment about quality of info.			
	Model R^2	.39	.44	.31