

DEMONSTRATION OF METHODS TO ASSESS THE USE, VALUE AND ROI OF ALL ACADEMIC LIBRARY SERVICES

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Background

The University of Tennessee, School of Information Sciences obtained a three year grant from the Institute of Museum and Library Services (IMLS) to assess the value and return-on-investment of academic library services, referred to as LibValue. The project involves a number of specific projects performed at several universities and with the Association of Research Libraries (ARL).

These projects include:

- Scholarly reading (University of Tennessee). This project measures the value of reading by scholars and students of articles, books and other documents through surveys.
- Syracuse University study of the comprehensive value of the academic library including the economic, environmental and social value to faculty and students based on surveys.
- Teaching and learning. (University of Tennessee). An experimental design to assess the impact of library instruction on student learning and success.

- Two New York universities that replicate the Syracuse University study and one the teaching and learning survey. Studies are designed and carried out at Syracuse University.
- Digital special collections (University of Tennessee). Examination of the role that special collections play in donations, recruiting of faculty and students and in generating goodwill and prestige for the university. Google analytics and weblogs are employed methods.
- Ebooks study (University of Illinois). This project is a follow-on of an earlier study to look at how faculty and graduate students value eBooks and how they are used. Methods include logbook analysis and surveys.
- ARL is to provide tools and guidelines made available and to support publications and presentations.

I felt that it would be useful to conduct a comprehensive assessment of all library services in a single library environment. Such an assessment would include both a cost analysis and survey of faculty and students' use and value of services. I proposed this to Carol Tenopir, PI at the University of Tennessee, and she enthusiastically supported the concept. I chose Bryant University because that is where I live and work and Bryant also agreed to participate. Later Drexel University also agreed to replicate the methods and will complete the survey and cost analysis later this spring (2012).

A Comprehensive Approach to Assessing Academic Library Services

This approach involves two main thrusts: an in-depth cost analysis of all library services and surveys of faculty, staff and students. This report provides a demonstration of the cost

analysis and of a survey method that can be used to assess the use, value and ROI of all library services. The demonstration involves surveys of library users at Bryant University.

Bryant University is a small, private Rhode Island school started in 1863 which emphasized business until recent years. It has Colleges of Business and of Arts and Sciences. Business students are required to take a minor in Arts and Sciences and Arts and Sciences students must take a minor in Business. It has developed a strong academic reputation with an exceptionally high retention rate, and over 96 percent of graduates consistently gain employment or go on to graduate school within six months of graduation.

Bryant has 3,472 students including 256 in the Master's program. There are 164 full-time faculty and 64 part-time lecturers and adjunct faculty. They also have 465 staff ranging from President to facilities staff. The library staff consists of 17 persons, mostly professionals. The small size of Bryant University has both advantages as well as disadvantages in conducting a comprehensive assessment. One advantage is that the small library staff makes it easier to establish how much time each spends on nearly 100 activities (see the section on Cost Analysis) and counting furniture items in order to establish costs is not as tedious as would be in a larger environment. A small community of faculty makes it more likely they participate in a survey due to their dedication to the University.

On the other hand, there is a small number of potential survey respondents, particularly after skip patterns reduce the number who actually answer specific questions. Therefore, some questions result in responses that are not statistically valid. That is, when there are fewer than about 30 responses, the Law of Large Numbers no longer applies. Since this project is a demonstration, the analysis and results ignore this issue. Some reported data are accompanied

with the population size (N), the initial sample size from which responses are drawn (n^1), and the actual sample responses to resulting questions (n).

The University mainly operates on a 35-week schedule which has a bearing on projecting survey results from one month to an entire year.

The surveys are web-based (Survey Monkey), however the faculty, staff and students were required to be contacted only through a new “MyBryant” website. Many were unfamiliar with MyBryant or did not use it at all. As a result, responses were disappointingly small and two actions were taken about ten days before the survey was to be closed before Thanksgiving. Faculty were finally allowed to be contacted by e-mail which brought the full-time faculty response rate up to over 46 percent. Secondly, students were handed out printed copies of the surveys in the library (by me). Such in-library surveys can be biased because frequent visitors are more likely to use services than infrequent users (and non-users). For this reason, all student responses are categorized as web-based or in-library. If results are close, the responses are combined and, if not, only web-based responses are analyzed.

The faculty and staff surveyed are asked questions about all library services which requires a very large number of responses. To ensure that respondents were required to answer fewer questions, many questions skipped out if the service is not used. For example, a large number of surveys by University of Tennessee show that about one-half of articles read by faculty are provided by the library. Therefore, when asked the source of a read article, about half of responses are skipped out and only questions dealing with library-provided articles are then asked. This proved to be the case with Bryant faculty. Some questions skipped out much more

heavily than anticipated such as only about 20 percent of books read came from library-provided sources, leaving only 18 responses to work with.

Students are notorious non-responders. To help with this, two surveys were given to students including one that dealt with obtaining articles, books and other publications from the library and one about all other library services.

The initial survey responses were as follows:

	Population	Initial Responses
Full-time faculty	164	75
Part-time faculty	94	31
Staff	465	32
Student reading survey	3,472	92
Web-based		(73)
In-library		(18)
Student other services survey	3,472	143
Web-based		(48)
In-library		(95)
Total	4,195	368

Some questions about amount of reading or use of a service had precoded responses in ranges such as 0, 1-5, or 6-10, etc. A range was converted to a numeric value using a geometric average since these values are traditionally log-normally distributed. A geometric average is calculated by the square root of the product of the range values (i.e., the square root of 6 times 10 is 7.746). When values are calculated they are often rounded to avoid spurious accuracy. For example, \$1,115,926 is rounded to \$1,116,000 and \$166,426 to \$166,400.

Previous studies have often projected a response from a short time to a year. For example, projecting from the statement of “number of uses the past month (30 days)” to a year

by a factor of 12. This was continued for faculty reading of articles, books and other publications because they are likely to continue reading when not teaching. Otherwise a 35-month year was used for library services. At Bryant, the gate count was used as a proxy to project the past month observation to a full 12 months. The gate count in October (when most observations were made) was 51,995 and the gate count for the year (2011) was 385,496. Therefore, 7.4 was used as the projection factor ($385,496 \div 51,995$).

Since part of the university's investment in library services involves the cost to faculty, staff and students (in addition to library costs), it is necessary to put a value on their time. Faculty compensation includes salaries and valued fringe benefits such as retirement, insurance, etc. Since faculty often work more hours than a normal work week, the total compensation is divided by 2,200 hours (an amount observed elsewhere). The average faculty cost is \$56.20 per hour and staff cost is \$36.00 per hour.

Student hourly rate is based on student tuition and corresponding time spent on university activities. The rationale for using tuition is that the university is responsible and invests in resources necessary to provide classes and other events for the amount that students pay. We asked students to indicate "Approximately how many hours do you spend in a typical week: In class, studying in the library, studying elsewhere, and in other university activities (attending a scheduled event, recreational activities, athletic events, volunteer services, etc.)." There are 35 weeks covered by tuition so the tuition is divided by that amount and then divided by the reported number of hours given by each student. Both web-based and in-library respondents answered this question with little difference resulting in an average cost of \$34.60 per hour.

The surveys of library users rely heavily on the critical incident method where the critical incident is the last visit, last use of a service (for example, circulation, reference, and access to

other materials, workstations, space, and so on) or last reading of a publication (i.e., article, book or other publication). From this point reference is only to a visit or use of a specified service. Survey questions include the number of visits made by the user within a specific time period, such as the previous month (30 days). That number represents a 'cluster' of visits. Subsequent questions deal specifically with the last visit made during that month, such as how much time was spent during that visit and which services were used. When focusing on the critical incident, in a sense, the survey population shifts from people to total annual number of visits and other activities. Total visits are estimated by multiplying the average number of visits per respondent made in a month times the surveyed population total and then projected to a year total (as for example, times 7.4). Thus, estimates of total visits are based on the population of visitors (and non-visitors). However, when estimates concern the critical incident of the last visit, the survey population observed becomes all visits of the population surveyed.

The critical incident method is a powerful tool because one can develop observations from multiple cross-classifications, say, from the last reading of an article. Questions about the last reading observed may include how the article was identified, where it was obtained, its format, the purpose for the reading, and outcomes resulting from reading. The critical incident method can produce combinations of observations such as the age of the articles identified through an online search, obtained from a library, and used for research; or one could compare articles read from library sources versus other sources (such as personal subscription or from a colleague), in print versus electronic, and the respective time spent reading, and outcomes of the reading by source.

There are two ways of estimating the total time spent visiting a library, for example. One way is to multiply the number of visits in a respondent cluster (such as 10 visits in a month by a

respondent) by the time spent visiting (for example 30 minutes) to obtain a total time for that respondent (e.g. $30 \times 10 = 300$ minutes). This total time can be averaged across all respondents and multiplied by the total number of persons in the population to estimate the total time (e.g. 300 minutes per respondent \times 1000 respondents = 300,000 minutes or 5,000 hours). The problem is that this method assumes that the time of the last visit (i.e. 30 minutes) is the same for all 10 visits made by a respondent in the past month. Thirty minutes is treated as an ‘average’ of the respondent cluster of times which will sometimes be low and sometimes high for nine of the actual visits made.

Another way of estimating total time spent visiting is to calculate the average time per visit across all respondents (i.e. 30 minutes per visit per respondent). This number is multiplied by the population total number of visits (i.e. 10 visits per respondent \times 1000 respondents = 10,000 visits). Thus, the total time is 30 minutes per visit \times 10,000 visits = 300,000 minutes or 5,000 hours. This approach is subject to bias because visit time might be correlated with the number of visits of respondents. That is, those who visit frequently might tend to spend less time per visit. This bias can be minimized by stratifying by number of visits.

The latter approach is the method used in this assessment. It is noted that the 5000 hours is an indication of the ‘value’ placed by users on library visits.

Below is the demonstration of faculty, staff and student surveys analyzed by use, value and return-on-investment (ROI). The survey questions are quoted in the text below followed by survey responses.

Scholarly Journal Article Reading by Faculty, Staff and Students

Amount of Reading

Journal article reading is defined as follows: “Articles can include those found in journal issues, websites, or separate copies such as preprints, reprints, and other electronic or paper copies. Reading is defined as going beyond the table of contents, title, and abstract to the body of the article.” Respondents were asked for “Number of articles read (including skimmed) in the past month.” They were then asked questions about the scholarly articles they read most recently, noting that “the last reading may not be typical, but will establish the range of reading patterns.”

The total number of readings¹ by faculty is estimated from the question above. A total of 75 full-time and 31 part-time faculty responded to the reading question and averaged 22.97 and 3.94 readings per person respectively in the past month. About 3.8 percent of faculty indicated they did not read an article in that time period. Since there is such a discrepancy in average reading, the two results are weighted as follows: $(164 \times 22.97 + 94 \times 3.94) = 4,137 \div 258 = 16.03 \times 12 = 192.4$ annual readings per faculty member. It is noted that the total annual reading by faculty is 49,640 (192.4×258) .

Staff averaged 1.91 readings in the past months and 47 percent did not read a scholarly article (N=465, n=32). The total annual readings by staff is 10,660 $(1.91 \times 465 \times 12)$. Students averaged 9.21 readings with 15.6 percent indicating they did not read an article in the past month (N=3,472, n=92). Total annual reading is 236,600 $(9.21 \times 3,472 \times 7.4)$. Since most students are in school 35 weeks the projection factor used is 7.4. From this point on, assessment and discussion deals only with reading of articles provided by the Bryant library.

1When a person reads an article it is referred to as a “reading” as opposed to an article that is read because articles are often read many times by a person.

To initiate critical incident questions, survey respondents were notified that: “The following questions in this section refer to the **SCHOLARLY ARTICLE YOU READ MOST RECENTLY**, even if you had previously read the article. Note that this last reading may not be typical, but will establish the range of reading patterns.”

In order to sort out readings from Bryant library provided articles, the following question was asked: “From where did you obtain this article you last read? Precoded responses.”

Source of Articles Read by Bryant Faculty (N=258, n¹=106, n =95) and Staff (N=465, n¹=32, n=7)

Source	Faculty Proportion (%)	Staff Proportion (%)
Non-Bryant sources		
Personal subscription	20.0	42.8
Free Web journal	5.3	28.6
Preprint copy of the article	1.1	-----
Copy of the article from a Colleague, author, etc.	10.5	14.3
An author’s website	1.1	
Other website	5.3	14.3
Other (not Bryant-related)	4.2	
Total	47.5%	100%

A total of 26,060 (52.5%) of the readings by faculty are from Bryant sources. The Bryant sources are described below:

Bryant Article Sources Read by Faculty (N=258, n¹=73, n=44)

Source	Readings (%)	Number
Bryant library's print collection	9.1	2,380
Bryant library's electronic database	66.2	17,240
Interlibrary borrowing	20.5	5,350
School, department, etc. subscription	4.2	1,090
Total	100%	26,060

The print current periodical and other collection is combined due to a small number of responses. The electronic database values are determined by the format of the article reading. About 24,970 readings are provided by the library and 1,090 obtained by a school or department subscription. No staff readings were obtained from Bryant sources and ignored further.

Sources of student readings were observed from the following question: "From where did you obtain this article you last read? Five precoded responses." Results are given below:

Source of Articles Read by Bryant Students (N=3,472, n¹=90), n =42 Web-based)

Source	Proportion (%)
Non-Bryant sources	
Personal subscription	2.4
A non-Bryant website	9.5
Someone other than your instructor/teacher	-----
Other (not Bryant-related services)	4
Bryant sources	
From the Bryant library or other university source	83.3

Total **100%**

A total of 197,100 readings by students are from Bryant sources (236,600 x 0.833). Those from the library are found from the question: “From what Bryant source did you obtain it? Seven precoded responses.” These responses are:

Bryant Sources of Articles Read by Students (N=465, n=44)

Bryant Source	(%)	Readings Number
Current periodical room	9.1	17,830
Other library print collection	2.2	4,380
Electronic database/reserves	64.3	126,740
Interlibrary loan	4.4	8,740
Instructor teacher	7.5	14,720
School, department subscription	12.5	24,680
Total	100%	197,100

Allocating the other responses, the proportion of the 197,100 article readings from the library is 80.0 percent or about 157,700 readings.

Other studies (2,3) have shown that articles read from library sources tend to be much older on average than those read from other sources. Faculty was asked, “What year was the last article you read published/posted?” Recognizing that the survey was conducted in late 2011, the years reported are as follows:

Year Read by Faculty and Students

Year Read Article was Published or Posted

Year	Faculty (N=258, n=44) Proportion (%)	Students (N=3,492, n=26) Proportion (%)
2011	38.6	7.7
2010	20.5	15.4
2007-09	6.8	34.6
2002-06	6.8	15.4
1997-01	6.8	11.5
1992-1996	4.5	3.8
And 1990, 1989, 1983, 1976, 1964, 1935 and 1931.		1990, 1984 and 1861.

This pattern for faculty is consistent with that observed in other academic institutions world-wide and is almost like a nuclear decay curve.

The format of Bryant library provided articles tend to be electronic (78.6%) versus print (21.4%) for faculty, which is also consistent with other academic institutions (2,3) which coincidentally show a very high proportion of articles read from personal subscriptions remain in print. Students relied on electronic format for 87.5 percent of readings and 12.5 percent in print.

The Value of Articles Provided by the Bryant Library

There are two types of value assessed here.

- Use value or the favorable consequences from reading
- Purchase value or what readers pay for the information in their time or money to process and read articles

Use value in this assessment is determined from the following set of questions concerning the outcome of reading an article:

- For what purposes did you use, or do you plan to use, the information obtained from the last article you read
- Which article is the principal purpose (from above)?
- How important is the information contained in this article to achieving your principal purpose?
- In what ways did the reading of the article affect the principal purpose? (Choose all that apply).
- Did you cite this article or do you plan to cite it in another publication (e.g., article, report, book, published proceeding, etc.)?

Purchase value is assessed by what readers pay in their time to obtain, process and read articles obtained from the Bryant library. Questions dealing with these values are as follows:

- How did you become aware of the last article you read?

The focus was on time spent browsing and searching versus another person told them, citation, etc.

- Found while browsing without a specific objective in mind, for example starting with a Journal name, Journal issue, table of contents, website, or other source of articles such as current periodicals.
- Approximately how much time did you spend browsing? (in minutes)
- Found while I (or someone on my behalf) was searching by subject, author's name, etc. from a web search engine, online or printed index, online journal collection, etc.

- Approximately how much time did you (or someone on your behalf) spend searching (in minutes)?

Since time spent browsing or searching can result in several articles being found, the total time was divided by the number of articles read.

- As a result, how many articles did you read and/or plan to read

After you identified this article, approximately how much time (in minutes) did you spend on each of the following activities (if no time was spent, please enter “0”)?

- Obtain, request, receive or download and display the article;
- Photocopy, scan or print the article;
- Other (please specify):

And finally,

- About how much time did you spend reading this article most recently (in minutes)?

Another “value” of articles obtained from the Bryant library is “contingent valuation.” This value is assessed from:

- If this article had not been available from the Bryant library or other university source, from where would you have obtained the article/information?
 - I would not bother getting the information
 - I would obtain the information from another source (e.g., colleague, purchase, etc.)

- Please specify source here
- In order to obtain the same article/information, if the Bryant source were not available, I would expect to spend: (If no time or money, please enter “0”)
 - In minutes
 - In dollars

Use Value Observations Made by Faculty and Students

Purposes of Reading by Faculty (N=258, n=42)

Purposes of Reading	Purposes of Reading Proportion (%)	Principal Purpose Proportion (%)
Research	85.0	59.5
Teaching	52.4	16.7
Administration	-----	-----
Current awareness/keeping up	33.3	7.1
Writing proposals, reports, articles, etc.	23.8	9.5
Consulting, advising others	4.8	-----
Internal or external presentations	14.3	2.4
Other	4.8	4.8
Total	219.1%	100%

Research is clearly the most frequent purpose of reading articles provided by the Bryant library with teaching somewhat less so. This is the typical result (1,2). The reading of an article averages 2.2 purposes.

Students were asked: “For what purpose was this article read? (choose only the best answer). Six precoded responses.”

Purpose of Reading by Students (N=3,472, n=41)

Purpose	Proportion (%)
This article was required reading in a course	19.5
I read the article to help a course assignment or course paper	56.2
This article was for a class report	19.5
I read this article to keep up with the literature	2.4
This article was just of personal interest	-----
Other	2.4
Total	100.0%

Importance in Achieving the Principal Purpose by Faculty and Usefulness for Students

Faculty (N=258, n=42)		Proportion (%)	Students (N=3,472, n=41)	
Importance Rating			Usefulness Rating	Proportion (%)
1	Not at all important	-----	Not at all useful	-----
2	Somewhat important	19.0	Somewhat useful	9.7
3	Important	28.6	Useful	29.3
4	Very important	38.1	Very useful	48.8
5	Absolutely essential	14.3	Absolutely essential	12.2
Total		100%	100%	

Over one-half of these readings by faculty are rated “very important” or “absolutely essential,” and “very useful” or “absolutely essential” by students. The average rating is 3.48 for faculty and 3.63 for students.

Ways in Which Reading by Faculty Affected the Principal Purpose (n=258, n=42)

Ways Affected the Purpose	Proportion (%)
It improved the result	54.8
It narrowed/broadened/changed the focus	31.0
It inspired new thinking/ideas	40.5
It resulted in collaboration/joint research	7.1
It resulted in faster completion	16.7
It resolved technical problems	2.4
It added to my general knowledge	64.3
It saved time or other resources	19.0
Other	-----
Total	235.8%

The reading affected the principal purpose in a number of significant ways. In fact a reading encouraged respondents to record 2.4 ways per reading.

Students were asked to report: “In what ways did it help in learning?” (Choose all that apply). Four precoded responses.”

Ways in Which Reading by Students Helped in Learning (N=3,472, n=40)

Ways Helped in Learning	Proportion (%)
Broadened my perspective on the topic	52.5
It inspired new thinking/ideas	32.5
It helped better understand the topic	82.5
Other	-----

Article Cited by Faculty in Other Publications (N=258, n=42)

Cited or Planned to Cite (Precoded Response)	Proportion (%)
No	21.4
Maybe	31.0
Already did	40.5
Will in the future	7.1
Total	100%

The Purchase Value of Obtaining and Reading Articles by Faculty and Students

The cost of reading articles

Altogether, there were about 24,970 annual readings by faculty of articles provided by the Bryant library. Faculty spent an average of 33.2 minutes per reading or a total of 13,820 hours reading those articles ($33.2 \div 60 \times 24,970$). This is what they pay in their time for the information provided them. Since faculty averages \$56.20 per hour in compensation, the University pays about \$776,700 in faculty compensation for them to read articles provided by the Bryant library. It is noted that the library cost of scholarly journals allocated to faculty reading (versus student reading) is \$62,870. Therefore faculty pay 12 times what it costs the library to provide access to these articles.

Students are observed to have 157,700 annual scholarly journal readings from library provided articles or an average of 45.4 readings per student. They average 29.2 minutes per reading or a total of 76,750 hours. At a cost of \$34.60 per hour, the total annual purchase value is \$2,656,000, which is 5.4 times the allocated cost to the library of \$487,760

The Cost of Browsing and Searching by Faculty and Students

Survey respondents were asked: “How did you become aware of the last article you read?”

Faculty become aware of the articles they need to read in many ways as follows:

Ways Faculty Became Aware (N=258, n=43)

	Proportion (%)
Browsing without a specific objective in mind	25.6
Found while searching by subject, author’s name, etc.	41.9
Found through citation in another publication	20
Another person told me about it	2.3
Other	9.3
Total	100%

About 6,350 readings by faculty are found by browsing and another 10,390 by searching or 16,740 total readings. Browsing and searching usually result in several articles that are read or planned to be read, but only one of which is the last article read. It is estimated that there were an average of 8.1 such articles read or planned to be read per browsing or search session.

The time spent browsing averaged 25.8 minutes or 2,730 total hours ($25.8 \div 60 \times 6,350$) and time spent searching averaged 23.9 minutes or 6,670 hours for 9,400 total hours browsing and searching. Since this time averaged 8.1 articles read or planned to be read, the total time spent on the last articles read is 1,160 hours ($9,400 \div 8.1$) or \$65,190 total cost.

Students became aware of read articles as shown below:

Ways Students Became Aware (N=3,472, n=53)

	Proportion (%)
Found while browsing without a specific objective in mind	17.0
Found while searching by subject, author's name, etc.	35.8
Found through citation in another publication	22.6
An instructor told me about it	5.7
It was in the course outline/reading list	11.3
Do not know, do not remember	5.7
Other	1.9
Total	100%

Students identified 26,810 articles from browsing ($0.17 \times 157,700$) and 56,460 from searching ($0.358 \times 157,700$). They average 32.8 minutes browsing for a total of 14,660 hours each session browsing, producing an average of 3.8 articles read or planned to be read so the total time required for the last article read is 3,860 hours, at a cost of \$133,560. Average time spent searching was 21.1 minutes for a total of 19,860 hours. With an average of 16.1 articles read, the total time for last articles read is 1,230 hours at a cost of \$42,560.

Some time can also be spent obtaining, requesting, or downloading and displaying a read article. It is estimated that faculty spends 1750 hours in this activity or \$98,350 ($0.07 \text{ hours} \times 24,970 = 1,750 \text{ hours} \times \56.20) in these activities. They also sometimes photocopy, scan, or print out a read article. For those activities they spend about 750 hours or \$42,150 ($0.03 \text{ hours} \times 24,970 = 750 \text{ hours} \times \56.20) in their time.

Students spend 27,730 hours actually obtaining the article, (e.g., going to the library), and 18,560 hours displaying, downloading, printing from an electronic source. The total cost to students of those activities is \$1,601,600 (46,290 hours x \$34.60). They spend about 2,440 hours scanning, photocopying, etc. from a read article at a cost to them of \$84,420.

The Total Time and Cost of Obtaining and Reading by Faculty and Students

The total time and cost are summarized below for faculty and student reading:

Source of Time and Cost	Faculty (N=258, n=42)		Student (N=3,472, n=33)	
	Time (Hours)	Cost (\$)	Time (Hours)	Cost (\$)
Reading	13,820	\$776,680	76,750	\$2,655,600
Browsing and searching	1,160	\$65,190	5,090	\$176,100
Obtaining, requesting, receiving, etc.	1,750	\$98,350	46,290	\$1,601,600
Photocopying, scanning, printing out	750	\$42,150	2,440	\$84,420
Total	17,480	\$982,370	130,570	\$4,517,720

Faculty pay 17,480 hours or \$982,370 in compensation to obtain and read information found in library provided articles. Since their time is such an important resource, they would not expend the resources on the information if not of significant value to them. Again, this purchase value is 15.6 times the cost of the allocated faculty cost of the Bryant library (\$62,870). Students pay 130,570 hours and \$4,517,720 for these activities which is 9.3 times the cost to the library (\$487,760).

University Investment in Bryant Library Provided Articles

Bryant University invests in user costs and in library costs. Therefore, the total university investment in library provided articles is:

- Faculty cost to identify and obtain articles: \$205,690
- Library cost to provide articles to faculty: \$62,870
- Student cost to identify and obtain articles: \$1,862,120
- Library cost to provide articles to students: \$487,760

Total Bryant University investment is \$2,618,440 which is \$14.30 per reading. The library investment is \$550,630 or \$3.00 per reading. It is noted that the total library investment in print current periodicals is \$204,580 (\$10.10 per reading); access to journal articles on the library shelves is \$62,250 (\$14.20 per reading); access to journals through the database is \$265,230 (\$1.80 per reading); and interlibrary borrowing of articles is \$18,470 (\$1.30 per reading). The discrepancy in the cost of the print and electronic collections is similar to what has been observed elsewhere (4, 5, 6).

Allocation of library investment by faculty and student article readings.

- **Current periodicals.** Faculty read 2,380 articles from the current periodicals collections, and students read about 17,830 such articles or 11.8 percent and 88.2 percent readings respectively. Allocating the \$204,580 by amount of reading shows that the investment for faculty use is \$24,140, and student use is \$180,440.
- **Access to articles on the library shelves.** There were no observed faculty readings from the library shelves and 4,380 readings from this source are by students. Therefore, all of the \$62,250 investment is allocated to studies and reading.
- **Ejournal database/reserves.** About 17,240 faculty readings are from the ejournal database/reserves and 126,750 student readings from there or 12.0 percent and 88.0

percent respectfully. Therefore, \$31,830 of the \$265,230 investment is allocated to faculty and \$233,400 to students

- **Interlibrary borrowing.** Faculty read from 5,350 borrowed articles and students 8,740 articles or 38.0 percent and 62.0 percent respectfully. The \$18,470 library investment is allocated as \$7,020 to faculty use and \$11,450 to student use.

Only one observation from the faculty and student surveys involved the Digital Commons @ Bryant University or other institution reporting and is ignored here.

It is noted that these eight services to faculty and students did not warrant detailed analysis of the values and ROI service. Only two of 14 had responses of more than ten.

Contingent Value of Access to Library Provided Articles

Contingent value is an economic measure of the cost of not having access to library-provided articles. Faculty was asked if the library had not been available, from where would they obtain the article or its information. Faculty said they would not bother getting the information for 40.5 percent of the readings. They would get the information from another source for 14,860 readings (N=258, n=42). They indicate that it would cost them an average of 27 minutes of their time or \$25.30 and \$2.20 in other costs to go to alternative sources. This comes to a total of \$408,650 ($\$27.50 \times 14,860$) to obtain alternative sources of the information. This is \$202,960 more than it now costs faculty to identify and obtain articles (\$205,690) which is considered the net benefit of the library provided articles.

Students were not asked about alternative sources of articles since it was felt that they would not know alternative sources.

Library Return-on-Investment (ROI) in the Scholarly Journal Services

All of the value measures assessed above are return components. However, the only dollar return is the net benefit of library articles provided to faculty calculated by contingent valuation (\$202,960). The library investment in faculty access to articles is \$62,990 so that the dollar return on this investment are 3.2 to 1 (i.e. $\$202,960 \div \$62,990$). This amount is consistent with assessment of other academic library journal collections (1, 2, 3).

Use, Value and ROI of Books Provided by the Bryant Library

Amount of Book Reading By Faculty, Staff and Students

Book reading is analyzed somewhat differently than article reading as indicated by another set of questions. Amount of book readings and critical incidents of book readings are established from the following question: “In the past month (30 days) approximately from how many books or parts of books did you read FOR WORK? Include reading from a portion of the book such as skimming or reading a chapter. Include classroom texts, scholarly or review books, etc. read in print or electronic format.”

There were 97 faculty who answered this question which resulted in their reading from an average of 4.35 books per faculty or a total of about 13,470 books read annually ($4.35 \times 258 \times 12$). A total of 23 staff members responded, and they averaged 0.41 books read which comes to 2,290 books over a year for the 465 staff.

Students reported on number of books read in the past week (7 days) because they were likely to read books more heavily than faculty and staff. As a consequence a weeks' reading is projected to a years' reading by a factor of 29.6 (4 x 7.4). Students reported averaging 4.75 books read in the past week which results in a total of 488,200 books read annually (4.75 x 3,472 x 29.6). This does not mean that many books are read but that there are 488,200 instances in which some book is read. (N=3,472, n=47).

From this point, analysis is done on the critical incident of last reading based on: "The following questions in this section refer to the **BOOK FROM WHICH YOU READ MOST RECENTLY**. Note that this last reading may not be typical, but will help us establish the range of reading patterns."

The respondents were asked to indicate the approximate title or topic of the last book read in order to get them to focus on a specific reading.

In order to establish readings from Bryant library sources, faculty were asked: "From where did you obtain this book you last read? Precoded responses."

Source used by Faculty and Staff to Obtain Books

Source	Faculty (N=278, n=81) Proportion (%)	Staff (N=465, n=4) Proportion (%)
Non-Bryant Sources		
I bought it myself	29.6	-----
A colleague, author or other person gave it to me	9.9	75.0
A free or advanced copy from the publisher	33.3	-----
Other	2.5	25.0
Bryant Sources	24.7	

Total 100% 100%

A total of (24.7%) 3,330 books are read by faculty from Bryant sources.

The Bryant sources are as follows:

Bryant book sources read by faculty (N=258), n¹=81, n=20)

Source	Readings (%)	Number
The Bryant library collection	50.0	1,665
Interlibrary loan from HELIN or other library	38.9	1,295
Faculty collection building opportunities/JIT	11.1	370
Total	100%	3,330

A total of 2,960 books are read from the Bryant library. Bryant library sources are the focus of subsequent analysis. No staff reported Bryant library sources of book reading. This infrequent reading of books obtained from the library was observed in United Kingdom libraries (1). All of the observed book reading from Bryant library sources are in print.

Students used different sources to obtain the book they last read.

Source Used by Students to Obtain Books (N=3,472, n=46)

Source	(%)	Number
Non-Bryant Sources		
I bought it	71.7	350,040
Other	2.2	10,470
Bryant Sources		
I checked it out from the Bryant library	8.7	42,470
I read it in the library	4.4	21,480
I obtained it through library reserves	6.5	31,730

Instructor/teacher	6.5	31,730
Total	100%	488,190

A total of (26.1%), 127,400 instances of books read by students are obtained from Bryant sources and 95,700 are from Bryant library sources including checked out from the Bryant library (42,470), obtained from the library reserves (31,730) and read from the print collection (21,480).

Faculty were asked how many times the book was read as follows: “About how many occasions did you read from this book in the last month (30 days)?” The library provided book was read an average of 7.13 times per person for an annual total of 21,100 annual readings (7.13 x 2,960). This question was not asked of students.

Use Value Observations Made by Faculty and Students

Purpose of reading asked for the same questions as with articles.

Purposes of Reading Books by Faculty (N=258, n=12)

Purpose	Purposes Proportion (%)	Principal Purpose Proportion (%)
Research	73.3	33.3
Teaching	60.0	33.3
Current awareness/keeping up	33.3	25.0
Writing proposals, reports, articles, etc.	26.7	-----
Consulting, advising others	13.3	-----
Internal or external presentations	13.3	8.3
Continuing education for self	20.0	-----
Other	-----	-----

Total 239.9% 99.9%

Research and teaching dominate purpose of reading, although teaching is much more frequently reported for books than articles. Faculty average reporting 2.4 purposes for reading this book.

Purpose of Reading Books by Students (N=3,472, n=41)

Purpose (Best Answer)	Proportion (%)
This book was required reading in a course	19.5
I need this book to help complete a course assignment or course paper (but it was not required)	56.2
This book was for a report	19.5
I need this book to keep up with the literature	2.4
Other	2.4
Total	100%

Importance in achieving the principal purpose by faculty and usefulness by students

	Faculty (N=258, n=15)	Student (N=3,472, n=41)	
		Importance Rating (1 to 5) (%)	Usefulness Rating (1 to 5) (%)
1 Not at all important	-----	-----	-----
2 Somewhat important	26.7	9.7	9.7
3 Important	33.3	29.3	29.3
4 Very important	20.0	48.8	48.8
5 Absolutely essential	30.0	12.2	12.2
Total	100%	100%	100%

Fifty percent of readings by faculty are considered very important or absolutely essential to achieving the principal purpose. The average rating by faculty is 3.33. Sixty-one percent of readings by students were rated very important or absolutely essential and the average rating is 3.64.

Ways in which the reading affected the principal purpose.

Ways Affected the Purpose of Faculty (N=258, n=15)

Ways (All that Apply)	Proportion (%)
It improved the result	46.7
It narrowed/broadened/changed the focus	26.7
It inspired new thinking/ideas	46.7
It resulted in faster completion	6.7
It added to general knowledge	40.0
It saved time or other resources	13.3
Total	180.1%

There was an average of 1.8 times the ways were given per reading.

Ways Affected the Purpose of Students (N=3,472, n=40)

Ways (All that apply)	Proportion (%)
It broadened my perspective on the topic	36.4
It inspired new thinking/ideas	36.4
It helped better understand the topic	72.7
Other	9.1
Total	154.6%

There was an average of 1.7 times the ways were given per reading.

Book read by faculty is cited in other publications

Cited or Planned by faculty (N=258, n=15)

Results	Proportion (%)
No	53.3
Maybe	13.3
Already did	13.3
Will in the future	20.0
Total	99.9%

The book readings are less likely to be cited than articles that are read.

The Purchase Value of Obtaining and Reading Library Provided Books

The cost of reading books by faculty and students

Faculty were asked: “About how many occasions did you read from these books in the past month (30 days)?” They averaged 7.1 readings per book for a total of 21,020 readings (7.1 x 2,960). Faculty was also asked: “About how much time did you spend reading this book in the past month (30 days)?”

Faculty reported spending 3.17 hours reading this book in the last month (or 27.1 minutes per reading) for a total cost of \$551,300 ($3.17 \text{ hours} \times 258 \times 12 = 9,810 \text{ hours} \times \56.20).

All of these books were in print when read.

Ways Faculty Became Aware of Book Last Read (N=257, n=16)

Ways Became Aware	Proportion (%)
Read while browsing the Bryant library catalog or subject guide without a specific objective in mind or through the book collection of the library	18.8
Found while I (or someone on my behalf) was searching by subject, author’s name, etc. through a catalog, Amazon.com, indexing, abstracting service, web search engine, etc.	18.8
Found through citation in another publication	18.8
Another person told me about it	12.4
Promotional email or web advertisement	18.8
Do not know, do not remember	12.4
Total	100%

Faculty read from 556 library provided books they found by browsing and by searching. They were asked: “Approximately how much time did you spend browsing when this book was found? In minutes.” They were also asked: “Approximately how much time did you (or someone on your behalf) spend searching? In minutes.”

The faculty spent an average of 35 minutes per faculty browsing when the book was found at an expense of \$33 in their time. This comes to a total of \$18,100 for the 556 books found by browsing ($0.58 \text{ hours} \times 556 = 322 \text{ hours} \times \56.20). Similarly, faculty spent an average of 38 minutes searching when the book was found at an expense of \$36 in their time for a total of \$19,670 for the 556 books found by searching ($0.63 \text{ hours} \times 556 = 350 \text{ hours} \times \56.20). Finally

they were asked about the time spent obtaining and processing the book. They averaged 0.13 hours per book. Therefore, they spent \$21,640 obtaining and processing the books they read.

Total Cost of Obtaining and Reading Books by Faculty (N=258, n=16).

Source of cost	\$
Browsing	\$18,100
Searching	\$19,670
Obtaining, etc.	\$21,640
Reading	\$551,300
Total	\$618,300

Students were asked: “How long did you spend reading this book the last time you read it? In minutes.” They averaged spending 45 minutes so that they averaged 21 hours annually reading books from the library ($45 \div 60 \times 27.6$). This comes to a total cost to students of \$2,523,000 ($21 \text{ hours} \times 3,472 = 72,910 \text{ hours} \times \34.60).

They were also asked: “How did you become aware of this book from which you last read? Six precoded responses.”

Ways Students Became Aware of Book Last Read (N=3,472, n=13)

Ways Became Aware	Proportion (%)
Found while browsing, etc.	15.4
Found while I was searching, etc.	15.4
It was required reading for a course	46.1
A Bryant librarian recommended it	7.7
Do not know/do not remember	7.7
Other	7.7
Total	100%

A total of 14,740 books provided by the library were found by browsing and by searching (0.154 x 95,700). They averaged 0.02 hours browsing for the book they read. Annually, they spend a total of \$10,210 browsing (0.02 hours x 14,740 = 295 hours x \$34.60). They spend a total of \$4,910 searching (0.03 hours x 14,740 = 142 hours x \$34.60). Students also spend time actually obtaining the books (e.g., going to the library). They averaged about 0.06 hours per book read at a cost of \$198,600 (0.06 hours x 95,700 = 5,740 hours x \$34.60). They spend about 0.16 hours annually scanning or photocopying or duplicating, printing, displaying from an electronic book for a total of 5,310 hours at a cost of \$529,700. Totally, the cost to students in identifying, processing, obtaining and reading books from the library is given below.

Total Cost of Obtaining and Reading Books by Students (N=3,472, n=13)

Source of cost	\$
Browsing	\$10,210
Searching	\$4,910
Obtaining, processing, etc.	\$728,300
Reading	\$2,523,000
Total	\$3,266,420

University Investment in Bryant Library Provided Books

The total university investment in Bryant library provided books is:

- Faculty cost to identify and obtain books: \$116,620
- Library cost to provide books to faculty: \$18,580
- Student cost to identify and obtain books: \$743,420
- Library cost to provide books to students: \$600,670

The total university investment in providing books is about \$1,479,000, which is \$15.00 per book that is read from the library. The library investment of \$619,250 is \$6.30 per book read.

The library investment in circulation of books is \$541,070, which is allocated by 42,470 student use and 210 faculty use is almost entirely to student use (\$538,410). Similarly the investment in access to print books in the library is \$46,640 allocated entirely to student use. There were no observations of the use of the electronic/digital book collection (investment of \$20,420) and only one faculty observation of interlibrary borrowing (investment of \$22,120).

Contingent Value of Access to Library Provided Books by Faculty

When asked: “If this book were not available from Bryant library or other university source, from where would you obtain the book/information” about 6.3 percent of the faculty said they would not bother getting the information. The 2,770 times they obtain the information from another source would cost them \$62,040 in their time and \$61,700 for purchase or other expenses. The total cost of \$123,740 is \$64,330 more than the current cost of browsing, searching and obtaining the books (\$59,410). Contingent value is not assessed for student use.

Library Return-on-Investment in the Library Provision of Books to Faculty

In addition to the values described above, the net benefit of the faculty use of books is \$64,330 (\$123,740 - \$59,440). The library investment is \$18,580 so that ROI is 3.5 to 1 (\$64,330 ÷ \$18,580).

Use, Value and ROI of Other Publications Provided by the Bryant Library

Reading of Other Publications by Faculty, Staff and Students

Faculty and staff were asked: “In the past month (30 days), approximately how many times have you read other publications for your work? Include conference proceedings, government documents, technical reports, magazines, trade journals, etc.” A total of 93 faculty, 22 staff and 61 students responded to the survey. Of these, 15 faculty, 14 staff and 26 students said they had not read these publications in the past month. Faculty averaged reading 8.17 other publications in the past month or 98 (8.17 x 12) projected to a year with the 258 faculty totaling 25,280 readings of these publications. Staff averaged 1.32 readings in the past month or 15.8 (1.32 x 12) projected for the 465 staff to 7,350 total readings. Students averaged 8.56 or 63.3 (8.56 x 7.4) projects to 219,800 readings (8.56 x 7.4 x 3,472).

Questions then addressed the other publication most recently read

The type of publication reported is as follows:

Type of Publication Read

Type of Publication	Faculty (N=258, n=78) Proportion (%)	Staff (N=465, n=8) Proportion (%)	Students (N=3,472, n=36) Proportion (%)
Conference proceeding	11.5	12.5	2.8
Government document or Other technical report	19.3	-----	30.6
Magazine/trade journal	53.8	62.5	61.0
Other	15.4	25.0	5.6
Total	100%	100%	100%

The Source of the Other Publications is as Follows:

Where the Other Publication Was Obtained

Source	Faculty (N=258, n=76) Proportion (%)	Staff (N=465, n=8) Proportion (%)	Students (N=3,472, n=35) Proportion (%)
Non-Bryant sources			
I bought myself	25.0	25.0	11.4
A colleague, author or other person	10.5	37.5	2.9
Online from a non-library source	35.5	37.5	20.0
Other	11.8	-----	2.9
Bryant Sources			
The Bryant library Collection (circulation/borrowed)	5.3	-----	34.3
The Bryant library Collection (read in Library)	4.0	-----	11.4
Interlibrary loan or HELIN Library System	1.3	-----	2.9
School or department collection	6.6	-----	
Instructor/teacher	-----	-----	14.2

Total 100% 100% 100%

A total of 4,350 of the readings by faculty are from Bryant sources and 2,680 are provided by the Bryant library. Of these library sources, 37.5 percent are obtained in print and 62.5 percent electronic. About 138,000 of the student readings are from Bryant sources and 106,800 are from the Bryant library.

Use Value Observations Made by Faculty and Students

Purposes of Reading by Faculty (N=258, n=8)

Purposes	Purpose Proportion (%)	Principal Purpose Proportion (%)
Research	62.5	62.5
Teaching	37.5	12.5
Current awareness/keeping up	37.5	25.0
Internal or external presentation (e.g., Lecture, conference paper)	12.5	-----
Total	150%	100%

An average of 1.5 purposes were reported.

Student Purposes of Reading (N=3,472, n=22)

Purposes	Proportion (%)
This publication was required reading in a course	27.3
I read this publication to help complete a course assignment or course paper (but it was not required)	31.8
This publication was for a report	27.3

This publication was just of personal interest	13.6
Total	100%

Importance to achieving the principal purpose.

Importance Rating (1-5)	Faculty (N=258, n=7) Proportion (%)	Usefulness	Student (N=3,472, n=23)
1 Not at all important	-----	Not at all useful	13.0
2 Somewhat important	-----	Somewhat useful	47.8
3 Important	28.6	Very useful	30.4
4 Very important	57.1	Absolutely essential	8.8
5 Absolutely essential	14.3		
	Total	100%	100%

Average importance rating is 3.86 for faculty and average usefulness rating for students is 3.35

Ways Reading by Faculty Affected the Principal Purpose (N=258, n=8)

Ways affected the purpose	Proportion (%)
It improved the result	37.5
It narrowed/broadened/changed the focus	25.0
It inspired new thinking/ideas	25.0
It resulted in collaborative/joint research	25.0
It resulted in faster completion	12.5
It added to general knowledge	12.5
It saved time or other resources	12.5
	Total
	150.0%

Faculty average 1.5 such ways per reading which are spread fairly broadly.

Ways in Which the Purpose Helped Students in Their Learning (N=3,472, n=22)

Ways affected the purpose	Proportion (%)
It broadened my perspective on the topic	60.9
It inspired new thinking/ideas	30.4
It helped better understand the topic	73.9
Total	165.2%

Publication was Cited or Planned to Be Cited(N=258, n=10)

Cited or Planned	Proportion (%)
No	50.0
Maybe	37.5
Already did	12.5
Will in the future	----
Total	100%

Cost of obtaining and reading other publications by faculty

Faculty average 31 minutes per reading other publications at a cost to them of \$78,120 (0.52 hours x 2,680 = 1,390 hours x \$56.20). They were asked: “Approximately how much time (in minutes) did you spend becoming aware of this publication you most recently read (for example, browsing, searching, etc.)?” They averaged 10 minutes per reading at a cost of \$25,630 (0.17 hours x 2,680 = 456 hours x \$56.20). They were also asked: “After you identified this publication, about how much time (in minutes) did you spend actually obtaining it,

photocopying, scanning, downloading or printing it?” Here they averaged seven minutes at a cost of \$18,100. ($0.12 \text{ hours} \times 2,680 = 322 \text{ hours} \times \56.20).

The total cost of becoming aware, obtaining and processing and reading other publications is \$121,850.

Cost of obtaining and reading other publications by students

Students average 27 minutes per reading other publications at a cost of about \$16 to them ($N=3,472$, $n=20$). The total cost of the 106,800 readings is \$1,662,900 ($0.45 \text{ hours} \times 106,800 = 48,060 \text{ hours} \times \34.60). They were asked: “Approximately how much time (in minutes) did you spend becoming aware of this publication you most recently read (e.g., browsing, searching)?” They averaged 12 minutes in this activity at a cost of \$7 ($N=3,472$, $n=23$) or \$739,000 ($0.20 \text{ hours} \times 106,800 = 21,360 \text{ hours} \times \34.60), averaged 11 minutes obtaining and providing the publication for a total cost of \$665,000 ($0.18 \times 106,806 = 19,220 \times \34.60).

The total cost of becoming aware, obtaining and processing, and reading other publications is \$3,066,900.

University Investment in Bryant Library Provided Other Publications

University Investment in Bryant library Providing Other Publications to faculty and students is:

- Faculty cost to identify and obtain other publications: \$43,730
- Library cost to provide other publications to faculty: \$2,330
- Student cost to identify and obtain other publications: \$1,404,000
- Library cost to provide other publications to students: \$92,860

The total university investment in providing other publications is \$1,542,900 or \$14.10 per reading. The library investment is \$95,190 or \$0.90 per reading.

The library investment in circulation of other publications is \$21,730 or \$0.30 per item circulated/reserved. Investment in access to other publications in the library is \$73,050 or \$2.80 per reading from the library collection. The investment from the electronic/digital collection is \$2.80 with no reported used. Investment in interlibrary borrowing of other publications is estimated to be \$130 while number of items borrowed is from two observations.

Contingent value of access to other publications by faculty

Seventy-five percent of other publication readings were instances in which faculty would seek alternative sources if the library sources were not available (N=258, n=8). Therefore, 2,010 alternative sources would be sought at a cost to faculty of \$53,110 in their time (0.47 hours x 2,010 = 945 hours x \$56.20). No other costs were given. Since they currently spend about \$43,730 in identifying and obtaining other publications, the net benefit is \$9,380.

The library Return-on-Investment of providing access to other publications by faculty

The net benefit of this service to faculty is \$9,380 and the allocated cost to the library is \$2,330 so that the library return-on-investment is roughly 4.0 to 1 ($\$9,380 \div \$2,330$).

OTHER BRYANT LIBRARY SERVICES

There is a basic difference in the method used to allocate library costs to faculty, staff and student use of publications and other library services. For use of publications the allocating of library costs is based on relative amount of readings of faculty, staff and students as

demonstrated previously. However, with other library services, the allocation is based on the amount of time faculty, staff and students spend using the services. For example, for services involving librarians (e.g., providing reference searches), the time users spend with librarians is a proxy indicator of cost of providing the services. When space (e.g., leisure/workspace) or other resources (e.g. workstations) are involved, the time spent using them is a better way to allocate than incidents of use.

Reference Searches by Librarians

Use and cost of reference searches conducted for faculty, staff and students

Faculty and staff were asked: “In the past year (12 months), approximately how many times did you use a librarian to conduct a reference search for your (catalog, database, getting access, etc.)?” A total of 115 faculty and staff responded to the question. Of this, 93 faculty responded for an average of 2.76 times per faculty member for a total of 712 searches over a year. It is estimated that 158 faculty used the service and spent an average of 1.22 hours working with the librarian on these searches (or 26.5 minutes per search) for a total of 190 hours. At \$56.20 per hour compensation meant that the total cost to faculty is \$10,830 (190 hours x \$56.20).

Twenty-two staff responded to the question for an average of 0.72 times annually per person or a total of 335 times they used librarians to conduct reference searches. An estimated 27 staff participated in this service spending an average of 0.32 hours. At a compensation of \$36.00 the total cost is \$3,850 (0.32 hours x 335 = 107 hours x \$36).

Students were asked: “In the past month (30 days), how many times did a Bryant librarian assist or conduct a reference search for/with you (catalog, database, etc.)?” They average using the service 0.84 times in that past month for an annual total of 21,580 searches ($0.84 \times 3,472 \times 7.4$). A total of 1,420 students used the service the past month an average of 2.05 times ($N=3,472$, $n^1=137$, $n=55$). They averaged a total time of 24.2 minutes or 11.8 minutes per search ($24.2 \div 2.05$) or \$6.80 per search. The total student cost is 4,240 hours or \$146,740 ($\$6.80 \times 21,580$).

University investment in reference searches by librarians

The total university investment in reference searches by librarians is:

- Faculty cost of searches: \$10,830
- Library cost to provide searches to faculty: \$12,130
- Staff cost of searches: \$3,850
- Library cost to provide searches to staff: \$6,950
- Student cost of searches: \$146,740
- Library cost to provide searches to students: \$142,620

The total university investment is \$323,120 or \$15.00 per search. The library investment is \$161,700 or \$7.50 per search. The library investment is about equal the user investment/purchase value (\$161,420).

Savings value of reference searches

When asked: “If there were no library, where would you go to conduct the last search done by a librarian.” Precoded responses are: “I would not bother, I would conduct the search

myself and I would go to another source.” Faculty said they would conduct the last search themselves or go to another source for 595 of the searches. They estimated it would cost them an average of 1.6 hours of their time or \$90 per search and \$46 in other costs. For the 595 searches for which they would use an alternative, it would cost faculty \$80,920. The current cost to faculty is \$10,830 for a net benefit of \$70,090.

Eighteen of the staff said they would conduct the last search themselves or go to another source at an average of 1.2 hours or \$43. This means that 223 searches would involve going to an alternative source at a cost of \$9,590. It currently costs them \$3,820 so that the net benefit is \$5,770.

Students were asked: “For the LAST TIME a librarian helped with a reference search, how much time do you think the librarian saved you (in minutes)? The average time saved was 54.8 minutes or \$31.60 in their time. The savings to students is \$681,930.

The library return-on-investment in providing reference searches

The net benefit to faculty for this service is \$70,090 and the allocated library cost is \$7,560 so that the library ROI is 9.3 to 1.

The net benefit to staff is \$5,770 and the allocated library cost is \$3,820 so the library is 1.5 to 1.

The savings to students is \$681,930 and the allocated library cost is \$142,620 so the library ROI is 4.8 to 1. It is noted that another value/return was also estimated. Students were asked: “How helpful was the librarian to you?” Results are given below.

Rating of Helpfulness of Librarians With a Reference Search (N=3,472, n=94, n=57)

Rating	Proportion (%)
1 Not particularly helpful	-----
2 Somewhat helpful	-----
3 Helpful	10.5
4 Very helpful	68.4
5 Absolutely essential to me	21.1
Total	100%

Average rating is 4.11.

The overall ROI across the three types of users is: total net benefit and savings of \$757,790 and library cost of \$161,700 for a library ROI of 4.7 to 1.

Librarians assigned to work with faculty on research projects

Number of such projects

Faculty and staff were asked: “The Bryant library sometimes assigns a librarian to work with faculty on a research project. In the past year (12 months), did you work with a librarian on such a research project?” A total of 53 faculty indicated they participated on such projects an average of 1.58 times in the past year (N=258, n=93, n=19). Therefore, there is an estimated 84 annual research projects.

Value of such research projects

Faculty were asked about the importance of working with a librarian on the most recent project and ways it was important.

Rating of Importance (N=258, n=19)

		Proportion (%)
1	Not at all important	-----
2	Somewhat important	10.5
3	Important	36.8
4	Very important	31.6
5	Absolutely essential	21.1
Total		100%

The average rating of importance is 3.63 and over one-half (52.6%) said working with a librarian was very important or absolutely essential to the project.

The following are ways in which working with a librarian was important:

Ways Librarian Was Important (N=258, n=19)

	Proportion (%)
It improves the results	78.4
It narrowed/broadened/changed the focus	42.1
It inspired new thinking/ideas	26.3
It resulted in collaboration/joint research	5.3
It resulted in faster completion	84.2
It resolved technical problems	21.1
It saved time or other resources	63.2

Working with a librarian helped in the project productivity: faster completion (84.2%) and saved time and other resources (63.2%) in addition to improving the results (78.9%).

University investment in assigning librarians on research projects

Faculty spends an average of 5.44 hours working with a librarian on the most recent research project. The total time is 457 hours and a cost of \$25,680. The library investment is \$10,660 for a total university investment of \$36,340. The average university investment is about \$430 per research project. The faculty investment is 2.4 times the library investment ($\$25,680 \div \$10,660$).

Savings value of assigning librarians on research projects

Faculty and staff were asked: “How much time or money did the librarian save you on the most recent project?” They reported saving an average of 8.74 hours per project or \$491 per project for a total of \$41,240. This is considered the net benefit.

Library return-on-investment in assigning librarians on research projects

The savings is \$41,240 and the library investment is \$10,660 so that library ROI is 3.9 to 1.

Other assistance in-library and remotely by telephone or text messaging

Use of other assistance

Faculty and staff seek assistance from the Bryant public service desks to answer questions about library services, circulation, looking up something, troubleshooting, etc. Faculty average using this service 1.81 times in the past month (30 days), 3,460 annual total times, and staff 0.85 times or 2,920 total times. They also ask for assistance remotely by telephone references, text or instant messaging, etc. Faculty average using this assistance 0.49 times or 940 annual total times and staff use it an average of 0.35 times or 1,200 total times.

Students were asked separately about assistance from the public service desk and by telephone reference, text and instant messaging. The 3,472 students average 2.29 uses of the public service desks per student for 7,950 total uses over that time period or 58,830 annual total uses (N=3,472, n=143). About 2,060 students, or 59.4 percent, used this service in the past month (30 days).

Faculty average 0.18 hours in the past month using the two services for a total cost to them of \$19,330 (0.18 hours x 258 x 7.4=394 hours x \$56.20). Staff average 0.08 hours using the services for a total cost of \$9,900 (0.08 hours x 465 x 7.4 = 275 hours x \$36.00).

Students who use the service (2,060) averaged 10.2 minutes (0.17 hours) total time per user. This comes to a total of 2,590 hours at \$34.60 for \$89,610 total to them (0.17 x 2,060 x 7.4 =2,590 x \$34.60). Telephone, etc. assistance was used by fewer students 34.8 percent, or 1,210 of them (n=46 web-based). The users averaged 2.66 uses per user over the month. Therefore, they used the service for a total of 23,820 times (2.66 x 1,210 x 7.4).

University investment in other assistance

The library investment in the two services is \$166,820 for the public service desk and \$90,340 for remote assistance or \$257,160 total. The total university investment is:

- Faculty use of assistance: \$19,330
- Staff use of assistance: \$9,900
- Student use of assistance: \$89,610
- Library provision of assistance \$257,160

The total university investment is \$376,000 or \$4.10 per use (91,170 total uses).

The library investment (\$257,160) is \$61 per person and \$2.80 per use. The library cost of the public service desk (\$166,820) averages \$2.60 per use (65,210 uses) and telephone cost (\$90,340) averages \$3.50 per use (25,960 uses).

Savings value of other assistance

Faculty and staff were asked: “How much time or money did all this assistance save you?” Faculty saved \$66,320 in their time (0.62 hours x 258 x 7.4 = 1,180 hours x \$56.20) and \$4,310 in other costs (\$2.26 x 258 x 7.4). Staff saved \$28,440 in their time (0.23 hours x 465 hours x 7.4 = 790 x \$36.00) and they reported no other cost savings.

Students were asked about the “lost time” they sought assistance. The students saved \$285,100 in their use of the public service desk (0.14 hours x 58,830 users = 8,240 hours x \$34.60). They saved \$329,700 in use of the remote services (0.40) hours x 23,820 uses = 9,530 hours x \$34.60). Thus, students saved a total of \$614,800 for the two types of assistance.

Total savings is \$713,870.

Library ROI in providing other services

Total savings is \$713,870 and library investment in providing these other services is \$257,160. Therefore, library ROI is 2.8 to 1.

Library Instruction

The Bryant library provides formal classes and informal instruction to faculty, staff and student use.

Formal instruction

Survey respondents were asked: “In the past year (12 months), did you attend a formal class or an instructional course at Bryant library taught by a member of the library staff? Yes or no?”

About 20.6 percent of faculty (n=92), 15.0 percent of staff (n=20) and 37.7 percent of students (n=138 total) reported that they attended such instruction. Those who attended were asked: “About how much of your time did such instruction involve, including both in class and studying?” The 53 faculty who attended class spent an average of 1.3 hours for a total of 68.9 hours at a cost of \$3,870 to them. They were further asked: “How important was the instruction to themselves?” Ratings of importance are 1-5.

Rating of Importance (N=258, n=19)

		Proportion (%)
1	Not at all useful	-----
2	Somewhat useful	26.3
3	Useful	42.1
4	Very useful	21.1
5	Absolutely useful	10.5
Total		100%

The average rating of importance is 3.16.

About 70 staff attended this instruction and they averaged about two-thirds of an hour or 46.6 hours at a cost of \$1,680. (N=460, n¹=20, n=2). Rating of importance only involved two responses, somewhat important and important.

A total of 1,310 students are estimated to attend this instruction with an average of 24.6 hours attendance and study (N=3,472, n¹=86, n=13 web-based). Therefore, they spent a total of 32,230 hours at a cost of \$1,115,000. The students were asked how useful the course was (vs. importance by faculty and staff). Ratings of usefulness are as follows:

Rating of Usefulness (N=3,472, n=138, n=51 total)

		Proportion
1	Not at all useful	-----
2	Somewhat useful	21.6
3	Useful	39.2
4	Very useful	35.3
5	Absolutely useful	3.9
Total		100%

Average usefulness rating is 3.22.

University investment in formal instruction

The university in instruction is as follows:

- Faculty attendance: \$3,870
- Library cost of faculty attendance: \$60
- Staff attendance: \$1,680
- Library cost of staff attendance: \$30
- Student attendance: \$1,115,000
- Library cost of student attendance: \$31,650

Total university investment is \$1,151,890 or \$35.60 per hour of attendance. The user purchase value (\$1,120,520) is 35.6 times the library investment.

Informal instruction

Survey respondents were asked: “In the past month (30 days), did you receive any specific informal instruction by Bryant library staff (e.g., use of workstations, searching databases)? Yes or no?” About 26.0 percent of faculty (n=92), 20.0 percent of staff (n=20), and 37.9 percent of students (n=1,320) indicate they received such instruction.

They were then asked: “About how much time did you spend with library staff members?” A total of 65 faculty is estimated to have received informal instruction in the past month. These 65 faculty members averaged 25 minutes total time for a total of 200 hours annually or \$11,240 cost ($65 \times 25 \div 60 \times 7.4 = 200 \times \56.20).

Users were asked: “How important was the instruction you received to your work?” The faculty ratings are as follows:

Rating of Importance (N=258, n=72)

		Proportion (%)
1	Not at all important	-----
2	Somewhat important	18.2
3	Important	22.7
4	Very important	40.9
5	Absolutely essential	18.2
Total		100%

Average rating is 3.59.

A total of 93 staff average 17 minutes of instruction ($n=465$, $n^1=20$, $n=4$) for a total of 195 hours annually ($17 \div 60 \times 93 \times 7.4 = 195 \times \36.00). This compares to a total cost for them of \$7,020. Only four staff reported importance: Not at all important (1 staff, somewhat important (2 staff), not very important (1 staff). Average rating is 2.25.

A total of 1,320 students are estimated to receive instruction in the past month ($n=137$). They averaged 29.6 minutes spent with library staff for a total of 4,820 total hours ($29.6 \div 60 \times 1,320 \times 7.4 = 4,820 \times 34.20$) at a cost of \$166,800. Usefulness of instruction is rated as follows:

Rating of Usefulness (N=3,472, n=53)

		Proportion (%)
1	Not at all useful	-----
2	Somewhat useful	1.9
3	Useful	28.3
4	Very useful	60.4
5	Absolutely essential	9.4
Total		100%

Average rating is 3.77 and nearly 70 percent of users considered the instruction “very useful” or “absolutely essential.”

University investment in informal instruction

University investment in informal instruction is:

- Faculty use: \$11,240

- Library cost of faculty use: \$1,420
- Staff use: \$3,420
- Library cost of staff use: \$1,390
- Student use: \$166,800
- Library cost of student use: \$34,230

Total university investment is \$218,500 or \$41.90 per hour use. The user purchase value (\$181,460) is 4.9 times the library investment (\$37,040).

Access to Various Materials

Access to equipment

Bryant library provides access to several types of equipment, iPads, laptops MP3 players, DVD players, and accessories such as battery chargers, internet cables, etc. Survey respondents were asked:

“In the past year (12 months) [past month (30 days) for students], have you borrowed such equipment? Yes or no.”

“About how many times have you borrowed such equipment?”

“If the library did not lend this equipment, would you have gotten it from elsewhere? Yes or no.”

“About how much would it cost you in time and/or money? In minutes? In dollars?”

About 59 faculty (22.8%), 147 staff (31.6%) and 970 students (27.9% web-based) indicated they borrowed such equipment in the past year.

Faculty who borrowed equipment did so an average of 1.93 times in a year for a total of 114 times. The assessed faculty cost is \$1,070 ($0.17 \text{ hours} \times 114 = 19 \text{ hours} \times \56.20). Of 59 faculty who borrowed, six (10.2%) stated that they would have gotten the equipment from elsewhere if the library did not lend the equipment. To obtain the equipment from another source would cost them 1.95 hours in their time or \$660 ($0.325 \text{ hours} \times 6 = 1.95 \times \56.20) and \$1,980 in other costs for a total of \$2,640.

The 147 staff who borrowed this equipment averaged borrowing about 3.33 times in the past year for a total of 490 times. Based on faculty time, the assumed staff cost is \$900 ($0.17 \text{ hours} \times 147 = 25 \text{ hours} \times \36.00). Staff indicated they would only pay \$100 in other costs from alternative sources.

The estimated 970 students who borrowed averaged doing so 2.20 times in the past month, or a total of 15,760 times. Based on faculty cost, the assumed student cost is \$92,730 ($0.17 \text{ hours} \times 2,130 \times 7.4 = 2,680 \text{ hours} \times \34.60). Nearly half (47.1%) of those who borrowed said they would get them from elsewhere, if the library did not lend them equipment. These 457 students expected to pay an average of 19.4 minutes or a total of 148 hours or a total of \$37,710 ($19.4 \div 60 \times 457.4 = 1,090 \text{ hours} \times \34.60). They also expected to pay an average of \$90 in other costs for a total of \$304,360 ($\$90 \times 457 \times 7.4$). Therefore, they would expect to pay a total of \$342,070 from using alternative sources.

University investment in providing access to equipment

The survey did not establish user time but is assumed to be ten minutes per use. The library investment is allocated to users by their number of uses. University investment in lending equipment is:

- Faculty assumed cost of borrowing equipment: \$1,070
- Library investment in lending equipment to faculty: \$2,190
- Staff assessment cost of borrowing equipment: \$900
- Library investment in lending equipment to staff: \$9,390
- Student assumed cost of borrowing equipment: \$92,730
- Library investment in lending equipment to students: \$40,830

Total university investment in access to equipment is \$147,110 or \$9.00 per item loaned. The library investment is \$52,410 or \$3.20 per item loaned.

Library contingent value of lending equipment

Six of 59 faculty who borrowed said they would get the equipment from elsewhere at a cost of \$2,640 or net benefit of \$1,570 (\$2,640-\$1,070). Staff net benefit minus \$800. Students would pay \$46,250 to obtain equipment from elsewhere for a net benefit of \$40,640. The total net benefit is \$41,410 for faculty, staff and students.

Library ROI in lending equipment to faculty and staff

In this instance the cost of the library to serve faculty, staff and students is \$52,410, and estimated net benefit is \$41,410 so ROI of providing equipment to faculty, staff and students is negative under assumptions made. However, the purchase value of users is \$94,700, 1.8 times the library investment (\$52,410).

Access to audiovisual materials

The survey addressed access to audiovisuals such as videos, DVDs, audiocassettes, CDs, etc. through the following questions:

“In the past month (30 days), did you use such audiovisual materials? Yes or no.”

“About how many times did you use audiovisual materials?”

“About how much time did you spend obtaining and using these audiovisual materials? In minutes or in hours?”

A total of 78 faculty (30.2%) used AV materials in the past year, and 25 staff (5.4%) and 496 students (14.3%) used AV materials in the past month. The 78 faculty used library provided AV materials an average 5.48 times in the past 12 months for a total of 427 times. They spent an average of 8.21 hours using these materials for a total of 640 hours (8.21×78) at an expense of \$35,990. ($8.21 \times 78 \times \56.20).

Staff averaged using the AV materials 4.0 times for a total of 100 uses (4.0×25) at an average nine hours for a total of 225 hours at a cost of \$8,100 ($9 \times 25 \times \36.00).

The 496 students who used AV an average of 1.67 times in past month for a total of 6,130 times ($1.67 \times 496 \times 7.4$). They spent an average of two hours using these materials for a total cost of \$36,110 ($2 \text{ hours} \times 496 \times \36.40).

Library investment in providing access to audiovisual materials

Note that the cost of using AV materials is akin to reading and not included in the university investment. The library investment is allocated to users by the times they used.

Library investment in providing AV materials is as follows:

- Library investment in providing AV materials to faculty: \$4,070
- Library investment in providing AV materials to staff: \$950
- Library investment in providing AV materials to students: \$58,410

The total library investment is \$63,430.

While the use cost is not considered part of the part of the university investment, it is a component of the users' purchase value. The ratio of purchase value to library investment is 1.3 to 1 ($\$80,200 \div \$63,430$).

Access to other materials

The Bryant library provides access to other materials such as videos, leisure materials (e.g. a novel), Netflix for education purposes, lesson materials, the institutional repository, etc.

The following questions were asked about these materials:

“In the past year (12 months) [past month (30 days) for students], have you read such materials? Yes or no.”

“If the library did not provide such materials, would you have gotten it from elsewhere? Yes or no.”

“About how much would it cost you in time and/or money?” In minutes? Or in dollars?”

Students were also asked:

“About how many times did you obtain such materials in the last month?”

It is estimated that 75 faculty (29.2%) and 220 staff (47.4%) used these materials in the past year (12 months) and 403 students (11.6%) used the materials in the past month (30 days). About 43 of these faculty said they would get the material elsewhere if the library did not lend the materials. ($N=258$, $n^1=89$, $n=15$). They would spend an average of 0.94 times and \$36 from another source for a total of \$3,820 ($0.94 \text{ hours} \times 43 = 40 \text{ hours} \times \$56.20 + 43 \times \$36$).

All of the 220 staff who used the materials are estimated to go elsewhere. (N=465, n¹=19, n=9). The cost to them is 0.36 hours and \$2.90 on average for a total cost of \$3,480 (0.36 hours x 220 = 79 hours x \$36 = \$2,840 + 220 x \$2.90).

The 458 students estimated to use these materials an average of 1.25 times a month. (N=3,472, n=43, n=5 web-based). This comes to a total of 4,240 uses annually (458 x 1.25 x 7.4). Of the 4,240 uses, about 2,120 would involve getting the material elsewhere if the library did not lend the material (n=10). The cost of obtaining such material for the LAST use averages about 0.61 hours and \$12 per use. The total cost to students is 1,290 hours or \$44,630 (0.61 hours x 2,120 = 1,290 hours x \$34.60) and \$25,440 (2,120 x \$12) in other costs or \$70,070 total.

Library investment in providing access to other materials

The survey did not determine the faculty and staff amount of use and cost of obtaining or using other materials, but did get amount of use for students. The library investment is allocated to users by the number of users as shown below:

- Library investment in providing other materials to faculty: \$1,360
- Library investment in providing other materials to staff: \$3,980
- Library investment in providing other materials to students: \$53,860

Total library investment is \$59,200 compared to the total cost of obtaining the other materials elsewhere of \$70,070 or 1.2 to 1.

Access to workstations

The Bryant library provides access to 81 workstations in the library. Questions dealing with this service are as follows:

“In the past year (12 months) [month (30 days) for students], have you used library workstations in the library? Yes or no.”

“About how much time have you spent using those workstations in the past year/month (12 months/30 days)? In minutes? In hours?”

“For what purpose did you use the workstation (choose all that apply)? 7 precoded responses.”

An estimated 70 (27.0%) faculty and 25 staff (5.2%) used the workstation the last year and 2,170 students (62.4%) used them in the past month.

The 70 faculty averaged using them about 0.92 hours or a total of 64.4 hours at an annual cost of \$3,620. The faculty purpose for using the workstations is as follows:

Purposes for Using Library Workstations (N=258, n¹=87, n=24)

Purposes	Proportion (%)
Research projects	41.7
Support teaching	50.6
Prepare publications	8.3
Prepare non-class presentations (e.g. conference papers)	8.3
To keep up or continue education	4.2
Email, blog, Facebook, etc.	41.7
Other	12.5
Total	167.3%

The 25 staff averaged using the workstations 2.0 hours in the past year for a total of 50 hours at a cost of \$1,800 (N=465, n¹=19, n=2). The two respondents said they used them for email, etc.

The 2,170 students who used the workstations in the past month averaged using them 15.5 hours per month for a total of 33,640 hours or 248,900 hours annually at a cost of \$8,612,000 (15.5 hours x 2,170 x 7.4 = 248,900 x \$34.60). The students used the workstations

to study for class (82.1%), look up something for class (56.1%), personal purposes (25.0%) and other purposes (14.3%).

University investment in providing access to workstations

University investment in access to workstations is as follows:

- Faculty use of workstations: \$3,620
- Library investment in faculty use of workstations: \$370
- Staff use of workstations: \$1,800
- Library investment in staff use of workstations: \$290
- Student use of workstations: \$8,612,000
- Library investment in student use of workstations: \$194,100

Total university investment is \$8,810,900 or \$260 per hour used. The library investment (\$194,760) is \$5.75 per hour used. The purchase investment (\$8,617,420) is 44 times the library investment (\$194,760).

Access to duplication services

Faculty and staff were asked only one question concerning duplication services. “On how many occasions have you had the Bryant library duplication services to photocopy, print or scan a document? About 43 faculty averaged using the service 3.0 times in the past month or 950 times annually (3.0 x 43 x 7.4) and staff reported no time using the service.

Students were asked a series of questions about access to duplication services:

“Approximately how many times in the past month (30 days) have you used the Bryant library duplication service?”

“What type of duplication was involved the last time you used it? Photocopying, scanning, downloading, printing or other?”

“About how much of your time was involved? In minutes?”

If there were not library duplication services, where would you go to get this last duplication? I will not bother. I would go to another source, or other?"

"What other service would you use?"

"How many minutes of time would you expect this service to cost?"

"How much money would you expect this service to cost? In dollars?"

It is estimated that 444 students used the duplication services in the past month an average of 3.61 times or a total of 1,600 times in the month or 11,860 times annually (N=3,472, n=39, n=5 web-based). These uses involved roughly 1,650 photocopied pages; 540 scannings; 180 downloadings; 9,290 printings; and 180 other type of duplication.

Time spent using duplication services

The estimated time spent using these services is 6.6 minutes (or 0.11 hours) per use. The total time 1,300 hours at a total cost of \$44,980 ($0.11 \text{ hours} \times 11,860 = 1,300 \text{ hours} \times \$36.40 = \$44,980$). If faculty also averages 6.6 minutes per use, the faculty total time would be 105 hours at a cost of \$5,900.

University investment in duplication services

The university investment in duplication services is:

- Faculty use of duplication services: \$5,900
- Library investment in faculty use of duplication services: \$420
- Student use of duplication services \$44,980
- Library investment in student use of duplication services: \$8,450

Total university investment is \$59,750 or \$110 per user and \$4.80 per use.

Contingent value of duplication services

About 10,610 uses (89.5%) of the total 11,860 uses by students involve those in which students would use an alternative source if the library wasn't available. The students indicate it

would take about 18 minutes to use an alternative and an additional cost of \$5.50 per use or \$110,370 (0.301 hours x 10,610 = 3,190 hours x \$34.60) and \$58,360 (\$5.50 x 10,610). Since the students currently spend \$44,980 using the services, the net benefit is \$123,750.

Similarly, if faculty use mirrors student use the contingent value would be 850 uses of alternative sources at a cost of \$14,380 (0.301 hours x 850 = 256 hours x \$56.20) in time and \$4,680 (\$5.50 x 850) in other costs. The net benefit would be \$13,160 (\$19,060-\$5,900). The total net benefit hypothetically would be \$136,910.

Library return-on-investment in duplication services

The total net benefit is \$136,910 and library investment is \$8,870 yielding a library ROI of 15.4 to 1.

Ways the Bryant Library Informs Users

Number of uses of ways users are informed

The Bryant library informs its users about services in many ways. Respondents were asked: “Which of the following ways have you ever participated, used or read?” Number of faculty, staff and students involved are as follows:

Ways informed	Number of users			
	Total	Faculty (N=258, n=89)	Staff (N=465, n=19)	Student (N=3,472, n=107)
Library orientation	Unk	-----	-----	2,045
Library _____	2,161	43	73	2,045
Exhibits and displays	1,150	93	147	910
Axis TV	1,172	29	98	1,045
Newsletter	1,582	128	416	1,038
Library blog, tweets Via Twitter, Facebook page	956	32	147	777
Open house	986	52	24	910

University investment in informing users

Faculty, staff and students were asked about seven ways they are informed about the library and its services: “The Bryant library informs its users about services in many ways. Which of the following have you ever used, participated in, or read? List of ways.” Below is a summary of number of faculty, staff and students who have used the means of informing users, the allocated library cost, and cost per user. Only students were asked about “library orientation” and 2,045 are estimated to have participated in orientation. Some may have confused orientation library tours given below. The library cost for orientation is \$5,550 so the cost per user is \$2.70 per user. The remaining means of informing are as follows:

Means of informing users

Informed by		Faculty (N=278, n=89)	Staff (N=465, n=19)	Students N=3,472, n=107)	Total
Library tours	No. of users	43	73	2,045	2,161
	Library cost(\$)	\$134	\$327	\$6,354	\$6,715
	Cost per user (\$)	-----	-----	-----	\$3.10
Exhibits	No. of users	93	147	910	1,150
	Library cost (\$)	\$575	\$908	\$5,623	\$7,106
	Cost per user (\$)	-----	-----	-----	\$6.20
Axis TV	No. of users	29	98	1,045	1,172
	Library cost (\$)	\$49	\$167	\$5,191	\$5,407
	Cost per user (\$)	-----	-----	-----	\$4.60
Newsletter	No. of users	128	416	1,038	1,572
	Library cost (\$)	\$688	\$2,238	\$5,583	\$8,509
	Cost per user (\$)	-----	-----	-----	\$3.50
Library blog, Tweets, FB	No. of users	32	147	777	956
	Library cost (\$)	\$519	\$2,385	\$12,604	\$15,508
	Cost per user (\$)	-----	-----	-----	\$16.20
Open house	No. of users	52	24	910	986
	Library cost (\$)	\$167	\$77	\$2,931	\$3,175
	Cost per user (\$)	-----	-----	-----	\$3.20

The total library investment in these means is \$48,970.

Use of Library Space

Access to leisure/workspace

The Bryant library provides workspace that has comfortable chairs and tables. This is referred to as “leisure/workspace.” Faculty and staff were asked:

“Have you used the library leisure/workspace in the past year (12 months) for reading or other work? Yes or no.”

“About how much time have you spent using the leisure/workspace in the past year (12 months)? In minutes or hours or days?”

“For what reasons did you use this space? (Choose all that apply).”

A total of .75 (29.2%) faculty said they used the space in the past year and averaged using it 12.2 hours. Thus, faculty spent a total of 315 hours at a cost of \$51,420 (12.2 hours x 75 = 915 hours x \$56.20).

About 61 faculty used it as a “A quiet/comfortable place to work,” nine “to meet with students,” nine “to meet with others,” and three for other reasons (N=258, n¹=89, n=26).

About 122 (26.2%) staff also used the leisure/workspace for an average of seven hours in the past year. Therefore, the space was used 854 hours at a cost of \$30,740 (7.0 hours x 122 = 854 hours x \$36.00). Of the 122 staff, 98 used the space as “ a quiet/comfortable place to work,” 24 used it “to meet with students,” and 24 “to meet with others.”

Students were asked:

“In the past month (30 days), how many times did you use the leisure/workspace in the Bryant library?”

“About how much total time have you spent in the leisure/workspace in the Bryant library in the past month (30 days)?”

About 2,340 (67.4%) students are estimated to use the space in the past month for an average of 10.3 hours in the month. Therefore, students total using the leisure/workspace a total of 178,400 hours at a cost of \$6,173,000 (10.3 hours x 2,340 x 7.4 = 178,400 hours x \$34.60).

University investment in the library leisure/workspace

The university investment in leisure/workspace is as follows:

- Faculty use of the leisure/workspace: \$51,420
- Library investment in faculty use of the space: \$1,480
- Staff use of the leisure/workspace: \$30,740
- Library investment in staff use of the space: \$1,390
- Student use of the leisure/workspace: \$6,173,000

- Library investment in student use of the space: \$289,390

Total university investment is \$6,258,030 or \$34.70 per hour use. The library investment is \$292,260, \$115 per user and \$1.60 per hour use. The user investment/purchase value is 21.4 times the library investment.

Access to library workrooms

The Bryant library provides faculty, staff and students access to several workrooms.

Faculty, staff and students were asked:

“Have you used any library workrooms (101, 102, 103, 21 FMC) in the past year (12 months) [past month (30 days) for students]? Yes or no.”

“How much time did you spend using these rooms?” In minutes or hours or days?”

“For what reasons did you use the rooms? Five precoded responses.”

About 91 (faculty (35.2%), 150 staff (32.3%) used these rooms in the past year and 2,310 students (two-thirds) used these rooms in past month.

The 91 faculty averaged using the workrooms 21.9 hours a year for a total of 1,990 hours in the past year at a cost of \$111,800 (21.9 hours x 91 = 1,990 x \$56.20). About 26 faculty used the rooms “for a class,” 68 “for a meeting,” and two for “other” reasons (N=258, n¹=89, n=31).

The 150 staff average 18.1 hours annually using the rooms for a total of 2,720 hours at a cost of \$97,920 (18.1 hours x 150 = 2,720 hours x \$36.00). Twenty-five staff are estimated to use the rooms for a class” 125 “for a meeting” and 50 “for a quiet place to work” (N=465, n¹=18, n=6).

The 2,310 students who used the rooms in the past month averaged using them 8.7 hours for a total of 148,720 hours annually at a cost of \$5,146,000 (8.7 hours x 2,310 x 7.4 = 148,720

hours x \$34.60). About 494 students use the rooms “for a class,” 1,710 “for a meeting room with students,” 2,420 to “study for a class,” 470 “to get away,” and 110 for “other reasons.”

University investment in use of library workrooms

University investment in library workrooms is:

- Faculty use of workrooms: \$111,800
- Library investment in faculty use of workrooms: \$1,060
- Staff use of workrooms: \$97,920
- Library investment in staff use of workrooms: \$1,450
- Student use of workrooms: \$5,146,000
- Library investment in student use of workrooms: \$79,260

Total university investment is \$5,437,500 or \$2,130 per user, and \$102 per hour. Library investment is \$81,770 or \$32.10 per user, and \$0.50 per hour use. The purchase value (\$5,355,720) is 65 times the library investment (\$81,770).

Space used for special programs

Faculty and staff were asked “Have you attended any special programs, invited speakers, etc. in the Bryant library rooms, Grand Hall, etc. in the past year (12 months)? Yes or no” and “how much total time did you spend at these special programs?” Students were not asked this question even though some special programs were addressed to or about students.

A total of 186 (72.1%) faculty said they had attended such programs for an average of 8.4 hours annually or 1,560 total hours at a cost of \$87,670 (8.4 hours x 186 = 1,560 hours x \$56.20).

An estimated 270 staff (58.1%) attended such programs for an average of 6.0 hours. Therefore, they spent a total of 1,620 hours at a cost to them of \$58,320 (6.0 hours x 270 = 1,620 hours x \$36.00).

No attempt is made in allocating the library cost to faculty, staff and students because the Grand Hall part of the library is used for so many purposes, both by Bryant and non-Bryant users. The space cost is about \$107,440.

Use of the Confucius Institute Library

Bryant University has a special relationship with a Chinese university and provides special classes and lectures on Chinese topics. To support this, Bryant has a Confucius Institute and library located on the edge of the campus. Faculty and staff were asked: “Have you used the Confucius Institute Library services in the past year (12 months)? Include visiting the library in the Chafee Center, receiving books, etc. through the Bryant Main Library, talking to staff, etc.? Yes or No” and “For the following, if services used. Please indicate the approximate number of times used in the past year. Four precoded responses.”

A total of 25 faculty (9.6%) and 38 staff (8.3%) are estimated to use the Confucius Library in the past year. The proportion of users is as follows:

Type of Use	Faculty (N=258, n¹=73, n=7) Total uses	Staff (N=465, n¹=36, n=3) Total uses
In-library visit to read books, etc.	136	38
Ordered books through Bryant Main Library	127	114
Received advice on what books to read	29	38
Other (please specify other below)	3	-----

An in-library survey is done to complement these results which will include student use.

Library Costs Associated With Interlibrary Lending and Service to Non-Bryant Users

The interlibrary lending costs are as follows:

- Interlibrary loans of articles: \$20,280
- Interlibrary loans of books: \$68,190
- Interlibrary loans of other publications: \$230
- Interlibrary loans of audiovisual material: \$8,390

The total ILL cost is \$97,090 which compares with the following cost to the library of borrowing:

- Article interlibrary borrowing: \$18,470
- Book interlibrary borrowing: \$22,120
- Other publication interlibrary borrowing: \$130
- Audiovisual material interlibrary borrowing: \$6,580

Total interlibrary borrowing cost is \$47,300.

The library cost of serving non-Bryant users is estimated to be \$20,230.

COST ANALYSIS STEPS TAKEN AT BRYANT UNIVERSITY

Background

The objective of cost analysis for the Bryant University Library is to establish the total cost of each principal service provided by this library. These costs will be added to costs incurred by faculty, staff and students in using the services to yield the total costs to the university to establish the investment component of Return-on-Investment of the library. The latter costs will be estimated from a survey of faculty, staff and students in the fall of 2011.

In addition, the detailed costs can be used to assess:

- The cost per use of each service.
- The cost of processing and providing access to each type of publication (i.e., book, journals, etc.) and other materials.
- The relative cost of different formats (i.e., print vs. electronic).
- The productivity or cost per output of each activity.
- The effect on library cost on of changes in number of faculty or students.

These metrics can be used for library decision-making and/or planning.

The basic steps in the library cost analysis are as follows:

- Identify the principal services provided by the library.
- Establish the resources such as staff, space, shelving, furniture, supplies, etc. that are used to provide services.
- Establish basic data that are used in the cost analysis.
- Estimate the cost of the five resources necessary to provide each service.

- Estimate staff costs of services.
- Estimate space costs of services.
- Estimate furniture costs of services.
- Estimate shelving costs of services.
- Estimate purchasing costs of services.
- Sum to estimate the total cost of each service.
- An Excel Spreadsheet is used for the cost analysis.

These steps are described in detail below.

Identify Principal Services Provided by the Library

The services identified for the Bryant Library are sub-divided by those provided to faculty and staff and those to students. Some services are also provided to alumni and others. They are categorized by access to library materials (i.e., periodicals, journals, books, monographs, other publications, AV materials, institutional repository/digital commons, equipment and other materials), interlibrary borrowing and lending, reference and research, library instruction, other services such duplication, publicity services, access to workstations, and access to library space. There are 77 services identified at Bryant with a complete list is given in Appendix A.

Establish Resources Used to Provide Services

The principal resources used to provide services are:

- **Staff** including all library staff members and student assistants. The cost for each staff member is allocated to work activities and then to services in Section 6 below.
- **Space** is allocated to services in Section 7 below.
- **Furniture** is allocated to services in Section 8.
- **Shelving** is allocated to relevant services in Section 9.
- **Purchases** of overhead/administration items, publications and other materials are allocated to services in Section 10.

The summary of costs of each service is given in Section 11.

Establish Basic Data Needed for the Cost Analysis

Basic data include university-wide and library staff specific data for the calendar year 2010. The university data include the overhead or administration rates applied to staff such as fringe benefits and rates that cover personnel processing, human resources, etc. The other kind of overhead/administration rates cover the cost of general administration, processing invoices and purchases, finance, etc. For the Bryant analyses we treated the fringe benefit rates separately and apply the appropriate rate to each staff member separately. We then apply a common overhead/administration cost to the total compensation of each staff member and to all current purchases.

Basic staff data applied to each staff member includes:

- **Work status** including permanent or temporary and full-time or part-time. The status has a bearing on type of fringe-benefits allowed.

- **Number of weekly hours.** Some full-time staff work 40 hours a week and others 35 hours. Part-time staff can range from 10 to 25 hours. The number of annual hours worked in 2010 is used to calculate the hourly rate of each staff member.
- **Annual salaries or wages.** This is determined for each staff member. If a staff member only worked part of 2010, this is taken into account.
- **Number of days/hours taken for time not at work.** This kind of fringe benefit includes vacation, sick leave, holidays, jury duty, military leave, maternity leave, etc. This total time is subtracted from the traditional annual work hours (2080 or 1820) or part-time worked.
- Number of other days/hours taken off without pay. This is also subtracted from total hours.
- Overtime paid and hours involved.
- Bonuses paid.
- **Number of hours worked above a normal work week.** Some library staff work more hours in a year, but are not compensated for that time. This time is taken into account when establishing the hourly rate of each staff member and is used to establish productivity of activities.
- **Total compensation for each staff member** includes salaries or wages, fringe benefits that area form of compensation such as insurance, pension, etc., overtime and bonuses.
- **Total annual work hours for each staff member** includes traditional annual work hours (2080 or 1820) or part-time worked, plus overtime hours and hours above a normal work week, less hours not at work and other hours taken off without pay.

The total compensation divided by total annual work hours gives an average hourly rate for each staff member that is multiplied times the annual hours spent on each activity described below.

Excel Spreadsheet

There are two separate spreadsheets. The first spreadsheet gives a matrix in which the columns are the basic data and calculations involving the 96 activities involved. There are several replications of the 96 activities representing different calculations. There are 34 rows where rows 1 through 22 involve the direct costs associated with 17 library staff members and student assistants and adjustments to make up for rounding errors. Rows 23 through 26 deal with university and library overhead/administration costs. Rows 27 through 30 are allocations of non-processing activities. Rows 31 through 34 are to provide a basis for allocating staff space and staff furniture to work activities.

The second spreadsheet is a matrix with columns representing service costs of the five resources and rows the 77 library services plus totals for columns and rows. Column A is a list of service categories, B is a brief description of services; C a service number (1-77 and total); D is staff costs; E through G space costs; H through L furniture costs; M through O shelving costs; P purchases; and Q total service costs. Rows 1 through 77 are services and 78 total service costs.

Estimate the Staff Costs for Each Service

Below are detailed steps that are taken to estimate staff costs for activities and then allocating activities to each service

6.1. Identify library staff

Identify library staff. Library staff is identified by name and a code 1 through 17 plus one for student assistants. This is entered in 17 rows and 3 columns (staff code Column A, last name Column B and first name Column C).

6.2. Establish relevant activities performed by staff

Establish relevant activities performed by staff. There are 96 such activities categorized by:

- Circulation and internal lending (Activities 1 through 7)
- Interlibrary lending (Activities 8 through 15)
- Reference & research/public services (Activities 16 through 22)
- Library instruction (Activities 23 through 27)
- Other services (Activities 28 through 30)
- Operational activities (Activities 31 through 75)
- Library publicity activities (Activities 76 through 82)
- Library management and administration (Activity 83)
- Non-processing activities (Activities 84 through 86)
- Systems activities (Activities 87 through 90)
- Scanning (Activities 91 through 93)
- Photography (Activity 94)
- Open and close library (Activity 95)
- Inventory (Activity 96)

A complete list of activities is given in Appendix B.

6.3. Prepare instructions for library staff to provide needed information

Prepare instructions for library staff to provide needed information. A Staff Basic Data Form and Instructions for filling out the activity log are given in Appendix C. These data collection activities require IRB approval. The Bryant IRB request is also given in Appendix C.

6.4. Survey of library staff (Staff Basic Data Form)

Survey of library staff (Staff Basic Data Form). The data collected from this form are entered into 19 columns for each staff member (rows 2-18). The first question provides the **name of the library staff member** so that the researcher can follow-up any reports. **Work status** (permanent/temporary and full-time/part-time) establishes eligibility of fringe benefits (Column D). Some part-time staff are on a limited months assignment and others weekly hour basis (Columns E and F give months and weekly hours of part-time staff). This helps establish the annual number of hours worked by each staff member. Any **overtime payment** (Column G) is added to salaries or wages and number of days or hours involved (Column H and I) are added to annual hours worked. Amount of any **bonuses** (Column J) is added to salaries or wages (along with overtime to establish total compensation). Sometimes library staff work **hours more than in a normal work week**. This amount of hours (Column K) is added to time at work to establish how much time is worked. Staff takes **paid time off** for vacation, sick leave, holidays, jury duty, military duty, paternity leave, etc. (Columns L through R). This time (Column S in days) is subtracted from total work days in a year (260) to establish the annual time actually at work. Sometimes some **time off is not compensated**. Such days are subtracted from total work days. Finally, some staff may have been hired during the year. The **number of months** (Column T) establishes amount of annual time worked for each staff.

6.5. Obtain relevant information from records

Obtain relevant information from records. This information is recorded in rows 2 through 18 (for each staff member, 19 and 20 for adjusted costs, and 21 for students). The relevant information is salaries or wages of each staff member; total compensation with bonuses and overtime added to salaries or wages; fringe benefits rate given as a multiplier. The fringe benefit multiplier for full-time staff is 1.3753 (including social security and FICA taxes, retirement, medical and dental insurance; life insurance, long-

term insurance, vacation accrued, and tuition of employee family members). Part-time employee fringe benefit multiplier includes only social security and FICA (1.0765) and annual hours assigned to each staff member such as 2080, 1820 or part-time. Total compensation (including fringe benefits) is total compensation times fringe benefit multiplier.

6.6. Staff members indicate proportion of time they spend (%) on each activity

Staff member indicates proportion of time they spend (%) on each activity. Staff are given in rows 2 through 18. The 96 activities are noted as columns W through DN and the proportions (%) recorded in 17 rows. Note the percent's ranged from even percents (1-100) to hundredths of a percent. One staff member gave hours that were converted to percent. One column (DO) is the sum of the columns to add to one hundred as a check and adjusted if necessary.

6.7. Percents are converted to true proportions

Percents are converted to true proportions. The percents are converted to true proportions by dividing by 100 and recorded for each staff member in the next columns (DP through HG). One column (HH) is the total proportions adjusted to come close to 1.000.

6.8. Determine number of hours worked in a year for each staff member

Determine number of hours worked in a year for each staff member and each activity. Number of hours worked in a year is calculated for each staff member. This step is as follows:

- Determine number of hours in a day for full-time staff (Column HM). There are 8 hours per day for those who work 2,080 hours annual and 7 hours for those who work 1,820 hours annually (Column HL). Part-time staff work 4 hours per day. One column gives hour worked per day. Full-time staff are paid 260 days in a year. Number of work days part-time are paid is annual hours worked \div 4.

- The next column, number of annual hours worked, (Column HM) is calculated by annual hours (HL) plus number of hours involved in overtime pay (Column I), plus number hours worked above a normal work week (Column K), minus number of hours off without pay (Column S, days times hours a day) minus paid hours off (paid days off times hours a day).
- The true proportions of each staff member and each activity are multiplied times total hours worked in 2010 to estimate total time spent by each staff member working on each activity.

6.9. Estimate total direct compensation of staff

Estimate total direct compensation of staff. Total direct compensation (Column HK) equals salaries and wages (including fringe benefits), overtime pay and bonuses for each staff member. Student compensation is \$39,407.94. These values are recoded in rows 2-18 and 21 for students.

6.10. Estimate hourly rates.

Hourly rate is total compensation including fringe benefits (Column HO) ÷ annual hours worked (Column HP). The **hourly rate** is multiplied times the proportion of time spent by staff for various activities to yield direct staff costs. These values are recorded in respective columns (HQ through). Student time is said to be 5,148.25 hours costing \$39,407.94. This comes to \$7.65 adjusted to \$8.24 for fringe benefits. The direct staff costs for each activity (Row 22) is found by summing rows 20 and 21. The salaries and wages given were 2% higher which adjusted by 0.98 for overstatement of salaries and wages given.

6.11. Estimate direct staff costs for each activity

Estimate direct staff costs for each activity. The direct staff cost of each activity (Column 19) is found by summing rows 2-18 for each activity. One column sums the columns which serve as a check on the total amount. Row 20 is the sum of each column and summed to a column as a check. If the totals do not add to the known amount row 19, row 20 is used as an adjustment by the ratio of known totals. Rows 20 and 21 are summed to provide an estimate of total direct staff costs of each activity.

6.12. Estimate university overhead administration cost for each activity

Estimate university overhead administration cost for each activity. Multiply each direct staff cost by an adjustment factor. These values are given as a row (23).

6.13 Estimate the Library overhead/administration factor

Estimate the Library overhead/administration factor. The library overhead/administration cost factor is estimated as follows: total staff cost including university overhead divided by (total staff costs minus library staff overhead activities - 83, 87, 88, 90, 93, 95, 96) = 1.2274. Each activity cost is multiplied by this factor, and given in row 25.

6.14. Estimate total staff cost for each activity

Estimate total staff cost for each activity. Total direct staff cost including, university and library overhead administration costs, are recorded for each activity and for each staff member. These values recorded in row 26.

6.15. Allocate non-processing activities

Allocate non-processing activities. Non-processing activities (84, 85, 86) are allocated to each relevant activity by the following factor: total staff costs divided by (total staff costs minus total non-processing costs) = 1.2242. These costs are recorded in row 27.

6.16. Determine indirect activities and allocate to direct activities

Determine indirect activities and allocate to direct activities. Most services are used by faculty and staff, as well as students. Since the library staff cannot make this distinction, the two types of services are determined by the user survey to be conducted in October. Below the relevant activities are allocated to each service. Also, use of collections (e.g., print and electronic books) involves direct, as well as, indirect activities. That is, circulation of books monographs is a direct activity (2) and their collection and development (33), acquisitions (44), cataloging (55), and physical processing (65), and reshelving books (74) are indirect activities. These activities are partitioned between circulation and other access by estimates of number of books shelved after circulation, those read in the library, and those loaned to other libraries. The direct activities are summed and recorded in rows.

6.17. Estimates of the staff costs of each service

The staff costs of each service. The activities assigned to each service is given in the list of Bryant services in Appendix A. Each listed service has assigned activities given in parenthesis. For example, activities assigned to access to current periodicals in the library by faculty/staff are collection development and management of print journals (31), acquisitions of print journals (42), cataloging of print journals (53), physical processing of print journals in current periodicals room (62), and reshelving of current periodicals (72). These costs are recorded in the second spreadsheet mentioned above.

6.18. Spreadsheet for linking resource costs and type of service

Resource costs by type of service. There are columns (A through Q) that represent service categories (A), specific type of service (B), service number (C), staff costs (D), space costs (E-G), furniture costs (H-L), shelving costs (M-O), purchases (P) and total service costs (Q). There are 78 spreadsheet rows representing all 77 services and a total for each column. The total staff costs come to \$1,079,417. Other resource costs are described below.

6.19. Total staff costs for each service

Total staff costs for each service is determined following the allocated costs of activities that are assigned to each service. These costs are given as column D in the spreadsheet in 6.18.

Estimate the Library space costs for each service

Estimate the library space costs for each service. The steps involved include:

- Determine the total amount of space.
- Estimate the initial space costs.
- Allocate space to library operations.
- Allocate space to library services.
- Allocate staff space to services.
- Allocate other space costs to library services.

These steps are given in greater detail below.

7.1. Determine the total amount of space.

Determine the total amount of space. A floor plan of the library building is attached (Appendix D). We are told that there are 72,000 square feet of space in the building. Using a scale of 30 feet for one inch,

the two floors are estimated to be 40,774 square feet on the first floor and 31,128 on the second floor or 71,902 square feet total. Thus, 72,000 square feet is assumed and the 30 square feet per one inch is used.

7.2. Estimate the initial and present value space costs.

Estimate the initial and present value space costs. The library was built in 2002 at a cost of about \$25 million. The present value of these costs (CPI) are about 1.212 times the 2002 costs. These 2002 costs are depreciated and sub-divided as follow:

- Structure, architecture, engineering, soft costs (moving, legal, consultants) depreciated over 40 years.

$$\$21,667,391 \times 1.212 \div 40 = \$656,522$$

Or

$$\$9.12 \text{ per sq. ft.}$$

- Equipment depreciated over 5 years

$$\$135,518 \times 1.212 \div 5 = \$32,050 \text{ (including photocopying, etc.)}$$

Or

$$\$0.46 \text{ per sq. ft.}$$

- Technology depreciated over 10 years

$$\$840,468 \times 1.212 \div 10 = \$101,865$$

Or

$$\$1.41 \text{ per sq. ft.}$$

- AV & Data Dist. Depreciated over 10 years

$$\$1,316,386 \times 1.212 \div 10 = \$159,534$$

Or

\$2.22 per sq. ft.

- Utilities & Maintenance

\$8.50 per sq. ft.

TOTAL - \$21.71 per sq. ft.

7.3. Allocate space costs to library operations

Allocate space costs to library operations. First, it is necessary to allocate non-used/occupied space such as hallways, restrooms, janitorial storage, staircases, etc. The used/occupied-space is 55,024 square feet. Therefore the adjustment factor is $72,000 \div 55,024 = 1.309$ and all utilized space is multiplied by this number times \$21.71 per square foot is \$28.42 per square foot. The resultant space costs are as follows with allocation to services as stated above.

7.4 Allocate space to library services

Allocate space to library services. The library space is estimated to occupy 42,559 square feet as follows:

- Administration staff: 432 square feet

- Reference and technical services: 3,850 square feet

This space is allocated to services by the cost of staff time spent on services (see Column D on the second spreadsheet).

Access to materials is allocated as follows:

- Current periodicals: 2,530 square feet
- Journal backfile: 1,392 square feet
- Print books: 10,687 square feet
- Other materials: 2,133 square feet
- AV materials: 464 square feet

This space is allocated to services by faculty and student access to the publications and other materials.

- Library instruction: 4,105 square feet

This space is allocated by all its users determined in the upcoming surveys.

- Print booth: 253 square feet
- Paid photocopiers: 144 square feet
- Exhibits & displays: 232 square feet
- Axis TV: 36 square feet
- Workstations: 5,248 square feet
- Leisure/workspace: 8,622 square feet
- Workrooms: 2,431 square feet

This space is allocated to services by faculty and student access.

7.5. Allocate staff space to services

Allocate staff space to services. On the first spreadsheet, row 32 gives the cost of staff time spent on each service.

- Administration staff: \$12,277 (i.e., 432 x \$28.42)
- Reference and technical services: \$109,417

7.6. Allocate other space costs

Allocate other space costs. At this point, use of publications and other space combines faculty and student use and specific services involving library materials. Service numbers are given in parenthesis.

- Current periodicals: \$71,903 (1, 15, 73)
- Journal backfile: \$39,561 (2, 16, 73)
- Print books: \$279,623 (6, 20, 74)
- Read from shelf copies: \$24,101 (5, 19)
- Circulation of other publications: \$14,199 (9, 23, 75)
- Other publications read from shelves: \$47,221 (8, 22, 75)
- Duplication: \$7,190 (51, 52)
- Paid photocopiers: \$4,092
- Axis TV: \$1,023 (56, 62)
- Workstations: \$144,093 (66, 67)
- Leisure workspace: \$246,599 (68, 69)
- Workrooms for teaching: \$29,710 (70,71)
- Workrooms for programs: \$52,145 (72)

The other space costs are allocated by what the survey results show in terms of use.

8. Estimating the Service Cost of Library Furniture

The steps taken to estimate furniture costs are as follows:

- Determine the cost of today's furniture
- Allocate the furniture cost to services
- Allocate university administration/overhead costs to costs
- Allocate the cost of furniture

Details follow below:

8.1. The current cost of non-shelving furniture.

The current cost of non-shelving furniture is depreciated between 5 and 20 years as shown below.

The current cost of today's furniture.

The cost of today's furniture involves the following steps:

- Identify types of furniture and today's unit cost from catalog so the type of furniture and unit cost are given below:
 - Staff desks: \$1,000
 - Roll chairs: \$390
 - Other chairs: \$204
 - Filing cabinets: \$300
 - Small tables: \$700
 - Large tables: \$2,500
 - Reference desk: \$42,000
 - Catalog cabinets: \$310

- Cabinets: \$434
- Leisure/workspace sofas: \$1,380
- Leisure/workspace chairs: \$930
- Display/exhibit cabinets: \$1,600
- Carpeting is estimated to be \$20 per square yard installed

8.3. Allocate university administration/overhead costs to the purchase of furniture and carpeting.

The cost allocated comes to \$76,881.

8.4. Allocated furniture costs are:

The costs below include university administration/overhead and following depreciation.

- Staff furniture cost allocated to services:
 - Public service desk: \$42,000 depreciated 20 years = \$2,520 allocated to Reference & Research services
 - Staff furniture: \$113,280 depreciated 10 years = \$13,594 allocated by staff time in the same way.
- Carpeting: 6,800 square yards at (\$136,000 not included in furniture) depreciated 15 years = \$10,880 allocated same as space
- Other furniture cost allocated to services.
 - Library instruction are: \$86,800 depreciated 10 years: \$10,416
 - Paid photocopiers: \$1,000 depreciated 10 years = \$120
 - Exhibits and displays: \$8,000 depreciated 20 years: \$2,880
 - Axis TV (booth only): \$1,600 depreciated 20 years: \$90

- Workstations (tables and chairs): \$66,749 depreciated 20 years = \$9,009
- Leisure/workspace (including tables): \$181,460 depreciated 10 years = \$21,775
- Workrooms: \$43,320 depreciated 10 years = \$5,198
- Catalog cabinets: \$3,100 depreciated 10 years = \$310

8.5. Allocate furniture costs to services

Allocate furniture costs to services. Staff, furniture and carpeting are allocated by the proportion of staff costs. (see row 28 in spreadsheet number one).

Other allocations are based on the same proportions as “other” space costs. These costs are as follows with service numbers in parenthesis.

- Public service desk: \$2,520 (40, 41)
- Library instruction: \$10,416 (46 through 50)
- Exhibits and displays: \$2,880 (61)
- Axis TV (in lobby): \$96 (62)
- Workstations: \$9,009 (66, 67)
- Leisure/workspace: \$21,775 (68, 69)
- Workrooms: \$5,198 (70, 71)
- Other: \$120 (50, 51)

9. Estimating the Service Cost of shelving

9.1. Present value of the cost of shelving

Present value of shelving is currently \$38,755 depreciated 20 years. This is based on a cost of \$19.58 per linear feet for low shelves and \$7.90 for compact shelving.

9.2. Allocation of shelving to services

The service cost of shelving is as follows:

- Staff shelving: \$570 allocated by proportion of staff time.
- Current periodicals: \$754 (1, 15)
- Journal backfiles: \$4,139 (2, 16)
- Circulation of print books: \$29,256 (6, 20)
- Books read from shelves: \$2,522 (5,19)
- Circulation of other publications: \$350 (9, 23)
- Other publications read from shelves: \$1,164 (8,, 22)
- TOTAL: \$38,755

10. Estimate of the Service Cost of Purchases

The steps taken to estimate cost of services are as follows:

- Identify which purchases are indirect overhead/administration cost and direct service costs.
- Determine university and library overhead/administration factor and apply to purchase costs.
- Allocate cost of purchases to services.

Details follow below:

10.1. Identify which purchases are direct and indirect costs

Direct and indirect costs are identified as follows:

- Indirect purchases costs include such as office supplies and equipment, telephone and postage, dues, meeting and seminar fees, etc. These purchases come to \$40,618 in 2010.
- Direct service purchases are those directly related to such services involving publications and other materials, interlibrary borrowing and database involving consortia or vendors, etc. These purchases come to \$444,359

Total purchases in 2010 were \$484,977

10.2. Determine university and library overhead/administration multiplication factor

The combined overhead/administration factor is 1.3097 which applied to purchase costs.

10.3. Allocate cost of purchases to services

Cost of purchases are allocated as follows. In the absence of surveys giving service use. The purchase of library books (\$43,083) is allocated in proportion to staff costs.

- OCLC costs (\$12,592) are allocated in proportion to staff cataloging time involving publications and other materials.
- Ques (\$38,791) are allocated to interlibrary/borrowing and lending, reference searches, and access to e-journal data bases in proportion to staff costs.
- Library database purchases (\$336,683) are allocated in proportion to staff costs to access to e-journals and reference searches.
- The purchase of visual aids is allocated to AV materials

These service costs are reported in the second spreadsheet in column K.

11. Preliminary estimates of each service cost

The second spreadsheet sums cost of all resources in column L.

APPENDIX A

LIST OF BRYANT SERVICES

Bryant Library Services

1. Access to current periodicals in library by faculty/staff. (72, 31, 42, 53, 62)
2. Access to journal backfile in library by faculty/staff. (73, 63)
3. Access to electronic journals (academic, research, scholarly, etc.) on reserve by faculty/staff. (1, 32, 43, 54, 64)
4. Access to the library's electronic journal databases by faculty/staff. (17, 32, 43, 54, 64)

5. Access to print books/monographs (text, scholarly, review) in library by faculty/staff. (74, 33, 44, 55, 65)
6. Circulation of books/monographs (see 5) by faculty/staff. (2, 74, 33, 44, 55, 65)
7. Access to electronic/digital books by faculty/staff. (34, 45, 56)

8. Access to print other publications (conference proceedings, government documents, technical reports, trade journals, magazines, etc.) in library by faculty/staff. (75, 35, 46, 57, 66)
9. Circulation of other publications (see 8) by faculty/staff. (75, 3, 35, 46, 57, 66)
10. Access to electronic other publications (see 8) by faculty/staff. (35, 46, 57, 66)
11. Access to audiovisual materials (videos, DVDs, audio cassettes, CD's etc.) in the library by faculty/staff. (4, 36, 47, 58, 67)
12. Access to items in institutional repository/digital commons (faculty materials, news articles, legacy materials, etc.) in library by faculty/staff. (38, 49, 60)
13. Access to equipment (IPads, laptops, MP3 players, DVD players, accessories – battery chargers, internet cables, etc.) to faculty/staff. (6, 40, 51, 69)
14. Access to other materials (lesson materials, Netflix for educational purpose, leisure materials- novels, reference supplies, etc.) in library by faculty/staff. (7, 41, 52, 61, 70)

15. Access to current periodicals in library by students. (72, 31, 42, 53, 62)
16. Access to journal backfile in library by students. (73, 63)
17. Access to electronic journals on reserve by students. (1, 32, 43, 54, 64)
18. Access to the library's electronic journal databases by students. (16, 43, 54, 64)
19. Access to print books/monographs in library by students. (74, 33, 44, 55, 65)
20. Circulation of books/monographs (see 5) by students (2, 74, 33, 44, 55, 65)
21. Access to electronic/digital books by students. (34,, 45, 56)
22. Access to print other publications (see 8) in library by students. (75, 35, 46, 57, 66)
23. Circulation of other publications (see 8) by students. (75, 3, 35, 46, 57, 66)
24. Access to electronic other publications (see 8) by students. (35, 46, 57, 66)
25. Access to audiovisual materials (see 11) in the library by students. (4, 36, 47, 58, 67)

26. Access to items in institutional/digital commons (see 12) Circulation, Special Call. in library by students. (5)
27. Access to items in institutional repository/digital commons (see 13) to students. (38, 49, 60)
28. Access to equipment (see 15) to students. (6, 40, 51, 69)
29. Access to other materials (see 16) in library by students. (7, 41, 52, 61, 70)
30. Access to Chinese/Asian library. (37, 48, 59, 68)

Interlibrary Loans

31. Interlibrary borrowing of articles for faculty/staff. (8)
32. Interlibrary borrowing of books/monographs for faculty/staff. (9)
33. Interlibrary borrowing of other publications (see 8) for faculty/staff. (10)
34. Interlibrary borrowing of audiovisual materials (see 11) for faculty/staff. (11)
35. Interlibrary borrowing of articles for students. (8)
36. Interlibrary borrowing of books/monographs for students. (9)
37. Interlibrary borrowing of other publications (see 8) for students. (10)
38. Interlibrary borrowing of audiovisual materials (see 11) for students. (11)

Reference and Research

39. Conduct reference searches (catalog, databases, getting access, etc.) for faculty/staff. (17)
40. Assist faculty/staff at the public service desk (to answer questions about library services, circulation, citation assistance, looking up something, trouble shooting, etc. (19)
41. Assist faculty/staff on harder matters (telephone reference, text or instant messaging, etc.). (21)
42. Consulting with faculty/staff on research projects. (22)
43. Conduct reference searches (see 39) for students. (16)
44. Assist students at the public service desk (see 40). (18)
45. Assist students on harder matters (see 41). (20)

Library Instruction

46. Formal class given by library staff for faculty/staff. (24)
47. Informal instruction (Access to workstations, searching databases, etc.) for faculty/staff. (27)
48. Formal class (see 46) given by library staff for students. (23)
49. Informal instruction (see 48) for students. (26)
50. Conduct library orientation for students, family, etc. (25)

Other Services

- 51. Duplication services (assist in printing, photocopying, scanning) for faculty/staff. (29)
- 52. Duplication services (see 51) for students. (28)
- 53. Book delivery services for faculty/staff. (30)

Publicity Services

Participated/used by faculty/staff

- 54. Library tours. (76)
- 55. Exhibits and displays. (77)
- 56. Axis TV. (78)
- 57. Library newsletter. (79)
- 58. Library blog, tweets and twitter, facebook page. (80)
- 59. Open house. (81)

Participated/used by students

- 60. Library tours. (76)
- 61. Exhibits and displays. (77)
- 62. Axis TV. (78)
- 63. Library newsletter. (79)
- 64. Library blog, tweets and twitter, facebook page. (80)
- 65. Open house. (81)

Workstations

- 66. Access to workstations by students.
- 67. Access to workstations by faculty/staff.

Library Space

- 68. Access to leisure/workspace by students.
- 69. Access to leisure/workspace by faculty/staff.
- 70. Access to workrooms, (101, 102, 103, 214 and FMC) for course/class by faculty/staff.
- 71. Access to workrooms for special programs/invited speakers.
- 72. Access to Grand Hall for special programs/invited speakers, etc.

Non-University Services

- 73. Interlibrary loans of articles (12).
- 74. Interlibrary loans of books (13).
- 75. Interlibrary loans of other publications (14).
- 76. Interlibrary loans of audio visual materials (15).
- 77. Access to Bryan libraries by non-university users.

APPENDIX B

BRYANT STAFF ACTIVITY LIST

Activity Number

Circulation/Internal Lending (actual lending and receipt of materials)

1. Journals (academic, research, scholarly, etc.) on reserve.
2. Books/monographs (text, scholarly, reviews, etc.).
3. Other publications (conference proceedings, government documents, technical reports, trade journals, magazines, etc.).
4. Audiovisual materials (videos, audio cassettes, DVD's, CD's etc.).
5. Special collection items.
6. Equipment (IPads, laptops, MP3 players, Kindles, other players, accessories – battery chargers, internet cables, etc.)
7. Other materials (lesson materials, Netflix for educational purposes, leisure materials – novels, reference supplies.

Interlibrary Lending

8. Interlibrary borrowing of articles from external sources including HELIN and InRhode (lookup, receipt, scan, delivery, etc.).
9. Interlibrary borrowing of books/monographs (See 2).
10. Interlibrary borrowing of other publications (See 3).
11. Interlibrary borrowing of audiovisual materials (See 4).
12. Interlibrary lending of articles to external sources including HELIN and InRhode (receipt of request, locate, photocopy/scan or e-version, send).
13. Interlibrary lending of books/monographs (receipt of request, obtain, mail, process returned copy, etc.).
14. Interlibrary lending of other publications (See 3).
15. Interlibrary lending of audiovisual materials (See 4).

Reference and Research/Public Services

16. Conduct reference searches for students (catalog, databases, getting access, etc.).
17. Conduct reference searches for faculty/staff.
18. Assist students at the public service desk (to answer questions about library services, circulation, citation assistance, updating a patron record, looking up something, trouble shooting, etc.) often under 20 minutes.
19. Assist faculty/staff at the desk (See 18).
20. Assist students on harder matters often over 20 minutes (telephone reference, text messaging or instant messaging, etc.).
21. Assist faculty/staff on harder matters (See 20).
22. Consult in faculty/staff research.

Library Instruction

23. Present a formal class for students (class preparation, classroom time, follow-on, invited, technology sandbox, etc.).
24. Present a formal class for faculty/staff (See 23).
25. Conduct library orientation for students, family, etc.
26. Give informal instruction for students (on use of workstation, searching databases, etc. more than 18-22).
27. Give informal instruction for faculty/staff (See 26).

Other services

28. Duplication services for students (assist in printing, photocopying, scanning).
29. Duplication services for faculty/staff (See 28).
30. Book delivery service for faculty/staff (receive request, obtain materials, delivery).

Operational Activities

31. Collection development and management of print journals (review and approve materials, gift and exchange, collection weeding, identify missing/lost materials, etc.).
32. Collection development and management of electronic journals (review and approve materials, gift and exchange, collection weeding, identify missing/lost materials, etc.).
33. Collection development and management of print books/monographs (See 31).
34. Collection development and management of electronic books/monographs (See 31).
35. Collection development and management of other publications (See 3, 31).
36. Collection development and management of audiovisual materials (See 4, 31).
37. Collection development and management of Chinese/Asian materials (See 31).
38. Collection development and management of items in repository/digital commons (See 31).
39. Collection development and management of digital art collection (31).
40. Collection development and management of equipment (See 6, 31).
41. Collection development and management of other materials (See 7, 31).

42. Acquisitions of print journals (order new subscriptions, databases, order back orders, contact vendors/consortia, negotiate licenses, receive and verify, approve payments, invoice processing, visa reconciliation).
43. Acquisitions of electronic journals (order new subscriptions, databases, order back orders, contact vendors/consortia, negotiate licenses, receive and verify, approve payments, invoice processing, visa reconciliation).
44. Acquisition of print books/monographs (order, receive and verify, approve payments, process invoice).
45. Acquisition of electronic books/monographs (order, receive and verify, approve payments, process invoice).
46. Acquisition of other publications (See 3, 44).
47. Acquisitions of audiovisual materials (See 4, 44).
48. Acquisition of Chinese/Asian materials (See 44).
49. Acquisition of items in repository/digital commons (See 44).
50. Acquisition of art collection (See 44).
51. Acquisition of equipment (See 6, 44).

- 52. Acquisition of other materials (See 7, 44).
- 53. Cataloging of print journals (copy and enhanced, receive from HELIN, original, etc.)
- 54. Cataloging of electronic journals (copy and enhanced, receive from HELIN, original, etc.)
- 55. Cataloging of print books/monographs (See 53).
- 56. Cataloging of electronic books/monographs (See 53).
- 57. Cataloging of other publications (See 7, 53).
- 58. Cataloging of audiovisual materials (See 4, 53).
- 59. Cataloging of Chinese/Asian materials (See 53).
- 60. Cataloging of items in repository/digital commons (See 53).
- 61. Cataloging of other materials (See 7, 53).
- 62. Physical processing of journals in current periodicals room (initial shelving, weeding).
- 63. Physical processing of journals in backfiles (initial shelving, binding, spine labeling, barcodes, repair, weeding).
- 64. Processing electronic journal databases (set-up and maintenance, make changes, deal with Serials Solutions, etc.).
- 65. Physical processing of books/monographs (initial shelving, display, shelf maintenance, weeding).
- 66. Physical processing of other publications (See 3, 65).
- 67. Physical processing of audiovisual materials (See 4, 65).
- 68. Physical processing of Chinese/Asian materials (See 65).
- 69. Physical processing of equipment (6, 65).
- 70. Physical processing of other materials (See 7, 65).
- 71. Mail processing of publications and other materials.
- 72. Reshelving of current periodicals (including ILL, circulation and HELIN returns).
- 73. Reshelving of journal backfiles (See 72).
- 74. Reshelving of books/monographs (See 72).
- 75. Reshelving of other publications (See 3, 72).

Library Publicity Activity

- 76. Library tours
- 77. Exhibitions and displays (preparation, taking up and down).
- 78. Marketing via Axis TV (preparation).
- 79. Library newsletter (writing, publishing).
- 80. Library blog, tweets and twitter, facebook page.
- 81. Open House.
- 82. Outreach.

Library Management and Administration

- 83. Management and administration (finance, budgeting, and accounting; personnel management and staff development; managing student workers; facilities management; policies and procedures; reporting to supervisors; record keeping and statistics; etc.).

Non-processing Activities

84. Attending internal staff and other meetings (time going to and from and in meetings).
85. Professional development and training (internal training, workshops, society meetings, HELIN meetings).
86. OSHA breaks/lunch.

Systems Activities (write in your areas that involve the following and time involved)

87. Other administration (programming, workstation and server support, trouble shooting, vendor contacts, etc.).
88. Administration activities for ILS (involving cataloging, circulation, reserves, acquisitions, e-resources management, OPAC, proxy services).
89. Administration activities for the institutional repository system.
90. Website content management.

Scanning

91. Scanning for electronic reserves.
92. Scanning for Institutional Repository (Digital Commons).
93. Scanning for Website.

Photography

94. Photography and photo editing.
95. Open and close library
96. Inventory

APPENDIX C

STAFF BASIC DATA FORM

All data from this form are confidential and analyzed by **University of Tennessee Staff**.

(1) Please provide your name:

(2) Indicate your work status by checking the following

Permanent _____

Temporary _____

Full-time _____

Part-time _____

If part-time:

Number of months assigned _____ months (e.g., 9 months)

or

Number of weekly hours assigned _____ hours (e.g., 20 hours)

Please provide your best estimate of the data provided below.

(3) If you were paid overtime in the past 12 months (2010), please indicate the amount paid and number of days or hours involved:

Amount of overtime paid \$ _____

Number of days or hours involved:

or

_____ days

_____ hours

(4) If you were paid a bonus in the last year (2010), please indicate the amount.

\$ _____

(5) Please indicate the number of hours that you worked above a normal 40 hour (or 37.5, 35 hour) workweek that was not compensated.

_____ Hours

(6) Please indicate the number of days you took off in 2010 and were paid:

Vacation _____ days

Sick Leave _____ days

Holidays _____ days

Jury duty _____ days

Military duty __ days

Paternity leave _____ days

Other _____ days

(7) Please indicate any days you took off in 2010 for which you were not compensated (e.g., paternity leave, military, etc.) _____ days

(8) If you joined the library staff in 2010, indicate the number of months you have worked there. _____ months

THANK YOU!

INSTRUCTIONS FOR FILLING OUT THE ACTIVITY LOG

The purpose of the Activity log is to determine what activities related to serials you have performed in the last year (2010) and to indicate how much time you spent on these activities. To help you identify all of the activities that you did which were related to serials, we have included a list of activities and a code for each activity.

Please look through the list and select the activities that best describe what you do, especially as it relates to your work with serials. Make a note by any activity which you do **over the period of a year in any capacity of your library job.**

Record the activity code number, located to the left of the activity and a brief description of the activity, and whether it relates to print (P) or electronic (E) journals or books on the Activity log, recognizing that sometimes it will be both (P and E). If the print and electronic distinction is not relevant, place a (0) on the form in this area. For any activities which you perform that are not included on the numbered list (but which are related to serials), record them at the bottom of the log and number them beyond the last number given on the list.

Record the proportion of time you spend annually **at work** performing each activity. Do not include time when you are not at work such as vacation, holidays, etc. As a guide, if you work full-time, one week is about 2% of your time. Two 15 minute coffee breaks each day account for about 6% of your time over the course of a year. Pm the next page is a guide for converting actual time spent to a percentage of total time.

In past studies, it has been useful for the participants to first record the percentages of time for the activities they did not perform regularly, such as something you do once or twice a year; then calculate the numbers for coffee breaks, meetings, professional development and so on, and then record the percentages for your regular activities.

Don't worry about listing the activities in any particular order on your form.

If you only work with serials for part of the day (say, half the day in serials cataloging, the other half in general reference), please state the percentage of general reference time and all other non-serials activities on the last lines of the log and calculate all percentages accordingly.

Be sure the percentage column totals 100%.

Please give your name at the bottom of each form you fill out so we can relate to the staff basic data form.

These surveys will be kept confidential, and only aggregated numbers will be used for analysis.

APPENDX D

THIS WAS CALLED OUT IN THE TEXT AND NEEDS TO BE INSERTED