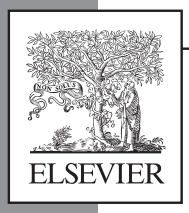
white paper #1



Library Connect
Partnering with the Library Community

University investment in the library: What's the return?

A case study at the University of Illinois at Urbana–Champaign

Judy Luther
President, Informed Strategies

2008

Library Connect Editorial Office
ELSEVIER
525 B Street, Suite 1900
San Diego, CA 92101, USA
Phone: +1.619.699.6379
libraryconnect@elsevier.com

ABOUT THE STUDY

In the spring of 2006, colleagues at Elsevier and I started noticing a theme arising in our individual conversations with customers. Librarians told us that their administrations were asking for research performance measurement, cost justification, and return on investment. Carol Tenopir had recently completed research that demonstrated the positive impact of electronic access on productivity. Both librarians and publishers had a hunch that such gains could subsequently have a positive impact on university funding. We collectively discussed the need for a return on investment (ROI) model that could apply to academic libraries, something that would articulate value in terms that would speak to the university administration. The model would need to encompass the value of all library content and not be limited to a single publisher's product.

At our North American Library Advisory Board (NALAB) in the fall, we proposed the idea of conducting a case study with an academic institution. Paula Kaufman immediately and boldly raised her hand to volunteer the University of Illinois at Urbana–Champaign, providing access to their records, data, and wonderfully brilliant staff. Since then, we've assembled an esteemed team, including Carol Tenopir, Judy Luther, and Kira Cooper from Elsevier. It's been a long year on this project, but at every step of the way we received ideas and encouragement from librarians from California to Alabama to Oslo. The study resonates with everyone we encounter, and I am very pleased that Elsevier has been able to partner with UIUC on such an ambitious project.

The results presented here are but a first step. We hope this information will generate dialog, debate, and increased appreciation for the library and the value of information resources to academic institutions.

Chrysanne Lowe
Vice President, Global Customer Marketing, Elsevier

CONTACT INFORMATION

Kira Cooper
Senior Communications Manager
ELSEVIER
525 B Street, Suite 1900
San Diego, CA 92101, USA
Phone: +1.619.699.6478
Fax: +1.619.699.6380
K.Cooper@elsevier.com

TABLE OF CONTENTS

Executive summary

The question

Academic libraries are being challenged increasingly to demonstrate their value to their institution in compelling quantitative terms. There is a growing need to provide a response based on sound methodology to questions about the value of the university's investment in the library.

> *"It used to be that the way you put together a library budget was to look at like institutions and then argue for a little more. Now my provost is saying to me, "If I give you x dollars, what is the return on investment to the University?"*
>
> *—T. Scott Plutchak, Librarian, University of Alabama at Birmingham*

In making decisions about competing priorities, university administrators evaluate their options in terms of how to allocate resources in the optimum way that will enable the institution to achieve its goals. At the University of Illinois at Urbana–Champaign (UIUC), Paula Kaufman, the University Librarian and Dean of Libraries, sought to identify the library's contribution by saying "for each dollar invested in the library, the university received *x* dollars in return." This statement framed the question of value from an economic perspective and guided the development of this case study.

Assessment initiatives in libraries are changing the metrics from inputs and activity (e.g., journals acquired, books circulated) that were measured in the print environment, to outputs and productivity measures that seek to reflect the impact of electronic resources where value is gained through functionality and accessibility of content. Guidelines for this study focused on developing a quantitative measure that recognizes the library's role in supporting the university's strategic goals. While most cost/benefit studies measure time or resources saved, this study highlights grant income generated by faculty using library materials.

Methodology and findings

A review of existing research identified several cost/benefit analyses based on user surveys and faculty productivity studies correlating citations and grants. However there were no models for calculating a return on investment (ROI) in academic libraries. Public libraries have begun to employ econometric models and contingent valuations that have identified a financial return from $3 to $6 for every dollar invested.

The model developed in this study was inspired by an article by Roger Strouse, Vice President and Lead Analyst with Outsell Inc., who described the contribution of corporate and government libraries to their institutions based on the time and costs saved by users and the income generated when using library resources.

A parallel model developed for the university environment examined the use of citations drawn from library resources in grant proposals, the success rate for proposals, and the average grant award. The university provided institutional data on the percent of faculty who are principal investigators, their success rate with grant proposals, the amount of university grants, and the library budget. A survey was conducted with UIUC faculty that validated assumptions in the model and provided measures that confirmed the importance and frequency of citations in grant proposals, and the likelihood that the citations used in grant proposals were drawn from library resources.

Comments from the survey addressed the extent to which access to electronic resources has changed the way many faculty work. Their use of a "library without limits" allows them to integrate digital resources into their work regardless of their location, enabling them to verify facts and update references as they write proposals, articles, and reports, whether they are on campus or traveling. Those involved with interdisciplinary research described how electronic resources enable them to explore research that intersects with multiple disciplines. Having faculty articulate the value and impact of working in a digital environment provides specific examples of the importance of electronic resources in supporting the university's goals.

This framework for valuing library resources builds on the work of Carol Tenopir and Donald W. King who were mentors to this project and contributed their extensive experience conducting research in higher education. It is clear that the context for this ROI model is limited to grant income and does not address the value of resources to faculty in conducting their research or teaching. Using the ROI model with UIUC data produced a return of $4.38 in grant income for every dollar invested in the library in 2006.

Conclusions and next steps

The results of this study represent one piece of a larger puzzle and it would be useful to expand the model to include other factors in the complete system of inputs (e.g., library resources, faculty, staff, and students) and the influence of each on the system. Extending the model would support the calculation of the ROI for an additional dollar invested in the library.

It would be interesting to replicate the survey at other universities to determine if the factors incorporated into the model vary, and to identify the ROI for a range of institutions. If data collection is extended over a 10-year period, it would be worthwhile to conduct a regression analysis to explore correlations on the number of faculty, the total library budget, and grant income to compare the results across institutions.

As libraries redefine their role in the academy and develop new metrics to reflect the value of their services, it is important to frame the conversation by connecting the library in a tangible way with the specific strategic goals of the university. Recognizing the library's contribution is as important to an institution as an entity as it is to the individuals and communities that it serves.

Introduction

Project goals

The primary goal was to create a quantifiable measure and a compelling position for the UIUC Library that would demonstrate economic value to the university administration. The objective was to be able to state that "For every dollar spent on the library, the university received x dollars in return."

In addition, the study sought to confirm the benefits of using electronic resources and the resulting impact on productivity over a 10-year period by examining:

- Budget shift from print to electronic resources
- Changes in intellectual output in the form of publications
- Changes in grant success rate
- Relationship between these trends

The majority of federal funding for research is in the sciences, and journals are the primary form of literature in the sciences. During this past decade, the most widely subscribed scholarly journals have been converted to electronic form.

Administrative perspective

Discussions with university administrators underscored strategic goals that focus on maintaining and strengthening the university environment to attract, sustain, and retain faculty whose creative accomplishments are of value to society. Obtaining the resources to support education and research, strengthening interdisciplinary work, connecting with the community, and managing efficiently are interconnected goals in the strategic plan. To achieve these goals, administrators must address the types of investments that are needed and where emphasis should be placed.

The impact of research is a key factor in attracting high-quality faculty and students. One measure of its significance is the ability to obtain grants. This is part of the cycle of research: conducting research, writing articles, submitting proposals, obtaining grants.

Two important points emerged from these discussions that influenced this study:

- The significance of "soft" factors such as prestige which is difficult to measure quantitatively
- The desire for benchmarks based on publicly available data that allow comparisons with peer institutions

In addressing the importance of attracting highly respected faculty, one university administrator noted that: "Funding does not regenerate funding. But reputation does."

Research review

Given the objectives for this case study, a literature review was conducted to determine if a suitable methodology existed for creating an ROI for an academic library. Although many cost/benefit studies have been conducted on the value of the library, only recent studies attempt to quantify the value of the library in terms of a ROI.

Return on investment

The definition for an ROI varies depending on the context and it is frequently expressed as income received as a percent of the amount invested in the asset. One definition that seemed applicable in the context of this project defines ROI as a return value for the life of the investment, not just a gain or loss, or the year-to-date return.

Social return on investment (SROI) is an emerging concept designed to document the social and environmental cost savings from public sector projects that warrant continued investment. It attempts to quantify social benefits by expanding the ROI to include factors not previously measured. Whereas a cost/benefit analysis is typically used either at the outset of an investment or retrospectively to determine whether it was worthwhile, SROI is a practical management tool that supports informed decision making on a regular basis.

Benchmarking studies on productivity

Programs that assess academic productivity have been based on different factors that generate debate on how comparable institutions are defined. Luis Porenza, in an issue of *Inside Higher Education* in May 2007, points out the need to distinguish between research competitiveness for available grant dollars in the form of inputs and faculty productivity as measured by citations or patents as an output. He also notes that 70% of federal funding is directed at biomedical research.

National Research Council (NRC): Assessment of U.S. research doctorate programs
Previously published in 1983 and 1995, the current NRC study has 200 universities participating and an update is planned for release in late 2007. This study was redesigned to help universities improve the quality of their programs through benchmarking, to provide potential students and the public with accessible information on doctoral programs nationwide, and to enhance the nation's overall research capacity.

Center for Measuring University Performance: Top American Research Universities (TARU)
The Lombardi Program on Measuring University Performance at the University of Florida has grown into an annual assessment of universities based on nine variables including: total and federal research expenditures, endowments and annual giving, national academy members, Guggenheim and Fulbright awards, doctorates and postdoctorates, average SAT scores, and National Merit and National Achievement scholars. TARU shows the competing schools' market share and their effectiveness in securing grants. Lombardi notably points out that the presence of either an engineering program or medical school skews expenditure rankings and affects comparability of institutions.

Academic Analytics: Faculty Scholarly Productivity Index
Academic Analytics is partially owned by SUNY Stony Brook, and produces the Faculty Scholarly Productivity Index, which evaluates faculty on their publications, grants, and awards. These data are weighted and aggregated to produce comparative rankings by program, discipline, and institution. Reports are custom produced for institutions, and summary data were published in the Chronicle of ***Higher Education*** in January 2007.

h index

Suggested in 2005 by J. E. Hirsch, who is on the physics faculty at the University of California San Diego, the ***h index*** has gained ready acceptance. It counts those papers where the citation level is equal to the total number of papers published and is used to count impact as well as productivity.

Measuring the value of libraries

Two excellent resources published in 2007 by leading organizations separately address the economic and social value of public libraries. The first provides a summary of tools used to quantify the financial benefits of public libraries, and the second covers the role of libraries in creating stable communities in the context of a competitive global information economy. Although academic libraries are developing new metrics on comparable usage data for electronic resources and implementing tools to measure user satisfaction, there are no tools or models in use that quantify the library's value in financial terms that benefit the university.

Americans for Libraries Council: Worth Their Weight

Published with a grant from the Gates Foundation, *Worth Their Weight* presents an overview of current library value assessment methodologies along with summary results of 17 public library studies. This report is the outcome of meetings that involved participants from the Institute of Museum and Library Studies (IMLS), Urban Libraries Council (ULC), American Library Community (ALA), and the library vendor community.

Three methods were highlighted:

- *Cost/benefit analysis* is the most popular approach. For example one of the measures calculates the benefit of circulated materials based on their cost times the number of circulations.
- *Contingent valuation* seeks survey responses to different scenarios involving the respondents "willingness to pay" more versus their "willingness to accept" less service.
- *Secondary economic impact analysis* applies a Regional Input–Output Modeling System (RIMS II) to calculate the economic impact of library employment and library spending.

Using econometric tools, public libraries can demonstrate a financial benefit to the communities that fund them. The complete picture would include an assessment of the social benefits they bestow.

Urban Libraries Council: Making Cities Stronger

Conducted by the Urban Institute and the Urban Libraries Council, this document repositions public libraries as essential for cities to be stable and competitive in the global information economy. Their economic value to the community is characterized by early literacy programs, preparation of technology workers, resources for small businesses, and buildings that are pivotal in creating stable neighborhoods.

Florida Public Libraries: ROI

A team of researchers led by Jose-Marie Griffiths, Dean of the School of Information and Library Science at the University of North Carolina Chapel Hill, found that a return of $6.54 was realized for every $1 invested in Florida's public libraries in 2004. The study used contingent valuation methods to determine the costs of not having libraries by examining alternative sources of information and the portion of economic contribution made by public libraries that would be lost, as well as the loss of benefits to users.

Southwest Ohio Public Libraries: ROI

Prepared by a private firm in Ohio, this analysis concluded that for every $1 invested in public libraries in four specific counties, the public received $3.81 in quantifiable benefits in 2005. The ROI was calculated based on the value of materials that circulated, reference, computer use, computer training, and outreach services, but it did not include use of noncirculating materials or in-house use of materials. In addition, the firm applied the Household Expenditure multiplier, published by the Bureau of Economic Analysis, U.S. Department of Commerce, to represent the local impact of staff expenditures. They did not attempt to quantify the value to the user of the information provided.

Balanced Scorecard for Libraries
Developed by Harvard professors in 1992, the Balanced Scorecard provides a template for organizations to use in creating strategic goals and selecting three or four performance measures for managing progress toward each objective. The library scorecard addresses five perspectives: financial, organizational readiness, internal processes, information resources, and the customer. Combined, they address the creation of value that is consistent with the mission of the organization.

Methodology

The need to identify a return on the university's investment led to linking the library to income generation rather than cost savings. Recognizing that faculty use citations in their grant proposals, this study connected the use of citations in successful proposals to library resources. A model for calculating income generated with the use of library resources that appeared in an article in *Information Outlook* published by the Special Libraries Association was adapted to the academic environment, and a survey was conducted to confirm assumptions. The results address one component of the libraries' role in the university's economy.

Conceptual framework

Faculty normally publish the results of their research in articles that are often cited in subsequent grant applications. At UIUC the majority of grant revenues are in the sciences and engineering. Publications in these disciplines were among the first to be offered in electronic form. Most UIUC faculty use the campus network to access electronic resources, and the majority of these collections are subscribed to by the library. These resources are the source of many of the citations that faculty reference in their grant proposals.

Methods considered
A number of approaches were explored before selecting the use of a model. The SROI model was appealing in terms of quantifying value, but required that measures be developed for social outcomes that would be difficult to define and quantify. Productivity measures such as the *h index*, which reflects both the output (articles published) and the impact (citations of articles) of faculty research, do not link the use of library resources to income generation.

The use of contingent valuation does not assume a relationship between activities and outcomes. Multivariate analyses show correlation, and regression analysis can show a causal relationship, but neither produces data that could be used in creating a (monetary) ROI. The same concern applied to social and behavioral models such as Q methodology, which examines the relationship between subjective claims in populations, and data envelopment analysis, which evaluates performance by measuring efficiency in converting inputs to outputs.

Trend data
Ten years of data were collected on grant proposals, grant awards, grant expenditures, library budgets, and numbers of faculty, principal investigators, and articles published by those associated with the university. During this period there was a parallel increase in the number of faculty and grant proposals and a greater increase in the number and size of grants.

The initial intent was to show the impact of electronic resources on faculty productivity. However, it was not possible to define the amount spent on e-resources or to count titles, as the library budget is allocated by discipline rather than format, and business models for journals frequently bundle the electronic with the print. Although usage data on electronic resources are being standardized with the implementation of COUNTER compliant data, it is still too early to have valid historical data across disciplines. Data on the number of publications authored by those affiliated with the university were obtained from Elsevier's Scopus database and confirmed an increase in the number of articles published per principal investigator.

The model

The model developed for use in this case study was inspired by the article "Demonstrating Value and Return on Investment: The Ongoing Imperative," by Roger Strouse of Outsell, Inc., which appeared in the March 2003 issue of *Information Outlook* published by the Special Libraries Association. This article describes three models: (1) time saved by library users, (2) money saved by library users, and (3) revenue generated when the library was used.

The revenue model states:

- *x* percent of survey respondents generated revenue using the library
- *y* percent of the instances when they used the library they generated revenue
- *z* is the median revenue generated with each library use

Each of these factors was multiplied to derive an amount of revenue generated for each library use.

The model as it is adapted for the academic environment employs parallel logic:

- *x* percent of faculty secure grants using citations in their proposals
- *y* percent of the grant proposals are successful
- *z* is the average size of the grant awarded using library resources

The model is extended to determine the return on the library budget from grant income.

This chart shows how the model was adapted to the academic environment.

Corporate library model	Adapted model for academic library
***XX*% of respondents report generating revenue with library's support**	***XX*% faculty with grants using citations**
–	–
***XX*% of instances when library was used, revenue was generated**	***XX*% grant proposal success rate using library resources**
–	–
$*XX* median revenue generated	**$*XX* average grant income**
=	=
$*XX* average revenue generated per library use	**$*XX* average grant income generated using library resources**
[no extension]	***X* Number of grants expended** **÷ $ library (materials) budget** = $ grant income for each $1 invested in library resources (ROI value)

Three factors that link the use of library resources to successful grant proposals are based on the following assumptions:

- Faculty use citations in grant proposals.
- Citations are important in the grant awards process.
- Citations come from resources provided by the library.

A faculty survey was conducted to determine the extent to which each of these factors applied at UIUC.

This model highlights the use of library resources in securing grant income for research, which is one part of a larger set of benefits and costs that include tuition revenue related to teaching, the value of time saved by types of users, the external value of university research to the community, and use of library space by student groups.

Data sources and definitions

The criteria for the data used in the model were that it had to be reliable, practical to obtain, and externally available if possible, so that this case study could be easily replicated. Different departments in the university provided data on grant expenditures, grant proposals and awards, faculty, and principal investigators. The library's total budget figure was taken from data published at the national level by the Association of Research Libraries (ARL).

Quantifying grant income using awards data is problematic as grants can be multiyear awards with income received over time or all at once, and they can be extended or renegotiated. The installation of software for managing grant awards affected the data at UIUC for 2004, which impacts trend lines. Data on grant expenditures were recommended because they are part of the university's reporting system that accounts for the disposition of each grant. All types of grants (e.g., research, instruction, academic support, public service) that were awarded to colleges and schools across all disciplines were included from all sources (e.g., federal, state).

Data on the number of tenure system faculty and principal investigators were taken from the UIUC campus profile at www.dmi.uiuc.edu. The decision was made to exclude the category of academic professionals who are typically not involved in securing grants. For example, in 2006–2007, 1700 faculty of the 2083 tenure system faculty (more than 80%) were principal investigators. Including the 3811 academic professionals would have skewed the results.

Faculty survey

The survey was designed to test assumptions and the responses confirmed that faculty use citations in grant proposals, that citations are important for grant awards, and that the library was most often the source of citations. Comments offered by the faculty describe the extent to which access to electronic resources has transformed the way they work.

Design and response

The survey was designed with 16 questions organized into three sections to collect data on the respondents, their grant experience, and their use of library resources. E-mail invitations were sent by Paula Kaufman and an espresso gift card was offered in appreciation of their completing the survey. Administered in September 2007 via SurveyMonkey, the survey was closed after 10 days.

Profile of respondents

A response rate of 16% was achieved, with 328 of 2045 faculty participating. More than half (54%) of these faculty spent more than 50% of their time conducting research, and nearly 60% had received peer recognition or an award.

There was good representation across the disciplines and an almost even split between social science/humanities (54%) and science/medicine (46%). Faculty were fairly evenly distributed in terms of their time at UIUC: 35% 5 years or less, 36% 6–15 years, and 29% more than 15 years.

Grant experience

The use of citations in grant proposals was deemed by 95% of the respondents to be either essential (75.3%), very important (12.3%), or important (7.3%). The remaining 5% felt that citations were somewhat important (4%) or unimportant (1%).

There are typically more references in articles for publication (49% use 25–49 citations) than in grant reports (59% use 1–25 citations) and in grant proposals (41% use 1–25 citations). Ninety-four percent of faculty responding used citations in grant proposals and only 6% did not use citations in proposals.

Use of library resources

Of the faculty responding, 94% stated that at least some of the books and journals they cited were obtained through the campus network or the Library Gateway.

Compared with the print environment, the median time for faculty to find and access needed books and articles in electronic form dropped from 7 to 2 hours per week, although the median time spent reading did not change from 10 hours per week. Comments repeatedly emphasized how much more efficiently they operate with electronic resources to maintain current awareness, select relevant articles, read more broadly, and identify related works.

IN THEIR OWN WORDS

In response to the final survey question about how access to online resources has changed how faculty work, 277 faculty (82%) offered comments. Several topics repeatedly surfaced and some of their responses are grouped thematically here to illustrate their experiences and perceptions.

Interdisciplinary nature of research

- "Our electronic resources are invaluable to my research. As I work in an interdisciplinary area, the journals I need are rarely shelved together because they span different subjects. So the retrieval of journal articles used to be a very time consuming endeavor that was mostly made up of walking around looking for things on different shelves and floors, with a little photocopying. Now I think of my library research time as reading time."
- "It allows me to search more journals more quickly and to keep a larger number of articles in PDF version (than was reasonable in print version) for future reference. This scope is essential for my interdisciplinary line of research."
- "I spend more time exploring works that are less obviously or less directly related to my research topic, because it's easy to locate a broader range of works and oftentimes easy to read abstracts and references to assess their relevance to my research. This has been very beneficial in identifying links between my work and work in allied fields."

Increased efficiency

- "I spend less time searching and more time reading!"
- "It has saved an enormous amount of time and made it possible to read more widely."
- "Enabled me to operate more efficiently and to spend my time actually using the resources rather than looking for them."
- "It has dramatically increased my research efficiency and acquaintance with my field."
- "I can work much more efficiently and be more comprehensive in the sources I locate and read."

Increased productivity

- "I could not submit as many grants. With grant funding levels at 4–6% of submitted proposals I would not have achieved my current funding level."
- "YES! Much better efficiency. Indeed I am using it this week in my NSF grant proposal. Not just to read new articles but to get all of the references correct in appropriate format, etc."
- "I am currently submitting a proposal for an NEH grant, roughly $40K, that will rely almost entirely on this kind of digital resource."
- "Completely changed the way I work by increasing my productivity. I don't waste time finding articles. I get them online and spend more time reading them."

How electronic resources have changed how they work

- "It has completely changed the way I peruse the literature. I can evaluate far more papers and more deeply because I have immediate access to the original text. I can also traverse the literature much faster and follow chains of citations. Finally, because I can save the electronic versions to my

computer, there is no need to spend time copying, and recall is instantaneous. It is one of the biggest time savers in my life."

- "This has changed the way we all work immensely. Browsing newly published literature is quick and easy rather than slow and arduous, which means I can read more broadly. Basically, I don't have to factor in the time needed to 'find and access'—almost all of my literature time is spent actually reading."
- "Can evaluate what's useful and what's not much more quickly, and can therefore focus reading/analysis of sources much more efficiently."
- "Especially valuable for me are full-text resources covering books and periodicals printed in the 18th and 19th centuries. When full-text searches are possible across a large archive of historical material, I can vastly increase the efficiency of my research."

Conclusions and next steps

Factors derived from faculty response to the survey were incorporated into the ROI model to produce a calculation that reflects one benefit of the library related to grant income. Extending this work to include more costs and benefit factors will produce a more complete picture of the value of the academic library.

Findings

The faculty participating in the survey clearly confirmed assumptions in the model, and an analysis of the responses provided three factors that serve as part of the model: 95% of responding faculty state that citations are important in securing grant awards, 94% of responding faculty use citations in grant proposals, and 94% of responding faculty obtained citations via the campus network or Library Gateway. Using these factors in the model produces a return of $4.38 in grant income to the university for every dollar invested in the library in 2006.

UIUC model – 2006 data		
No. of tenure system faculty	2,045	
No. of principal investigators	1,700	*Survey Q11: 94% of faculty use citations in grant proposals
A = % of faculty using citations in grant proposals*	78.14%	(1700x94%)/2045
No. of grant proposals	2,897	**Survey Q12: 94% of proposals include citations that are obtained via campus network
No. of grant awards	1,456	**Survey Q10: 95% of faculty state citations important or essential in grant awards
B = % proposals incorporating citations obtained through library**	50.79%	(1456x95%) / (2897x94%)
Average size of grant	$63,923	
C = Proportion of grant secured using library materials	$25,369	(78.14%x50.79%x$63,923)
No. of grants (expended) in year	6,232	
D = Proportion of grant income using library materials	$158,099,608	($25,369x6232)
Total library budget	$36,102,613	
E = University return in grant money on library	$4.38	($158,099,608/$36,102,613)

Next steps

It is important to note that grant income secured by faculty using library resources represents a portion of the value the university receives from the library. It does not include the value of library resources to faculty in teaching classes or in conducting their research.

In reviewing this model, Dr. Bruce Kingma, who has his Ph.D. in Economics and is the Associate Provost for Entrepreneurship and Innovation and has a joint appointment as Professor in both the Martin J. Whitman School of Management and the School of Information Studies at Syracuse University, suggested it would be worthwhile to expand this study to include the complete system of inputs—library resources, faculty, staff, and students—and to determine the influence of each on the system. An expanded model could support the projection for the return on an additional dollar invested. Other factors such as income from tuition, patents, and technology transfers could be included as part of the value equation. Implementing this model with multiple institutions could produce benchmarks and trends useful in assessing the impact of the library.

The development of a rich data set in support of an ROI for the academic library could be a useful reference as universities evaluate the many priorities competing for their resources. Quantifying the library's contribution to the process of securing grants highlights its supportive role in implementing the university's strategic plan. Positioning the library in this broader context provides metrics that reflect how the library supports institutional goals.

References

Ali, M. M., & Bhattacharyya, P. *The research grant and faculty productivity nexus: Heterogeneity among dissimilar institutions.* Manuscript submitted for publication.

Budd, J. M. (2006, May). Faculty publishing productivity: Comparisons over time. *College & Research Libraries*, 230–239.

Fogg, P. (2007, January 12). A new standard for measuring doctoral programs. *The Chronicle of Higher Education*, 53(19). Retrieved from http://chronicle.com/stats/productivity

Hirsch, J. E. (2005, September 29). An Index to quantify an individual's scientific research output. *arXiv:physics*. Retrieved from http://arxiv.org/abs/physics/0508025

Imholz, S., & Arns, J. W. (2007). *Worth Their Weight: An assessment of the evolving field of library valuation.* Americans for Libraries Council. Retrieved from http://www.actforlibraries.org/pdf/WorthTheirWeight.pdf

King, D. W., Aerni, S., Brody, F., Herbison, M., & Kohberger, P. (2004, May). *Comparative cost of the University of Pittsburgh Electronic and Print Library Collections*. Custom report prepared for the University of Pittsburgh.

King, D. W., Aerni, S., Brody, F., Herbison, M., & Knapp, A. (2004, April). *The use and outcomes of university library print and electronic collections*. Custom report prepared for the University of Pittsburgh.

King, D. W., Tenopir, C., & Clarke, M. (2006, October). Measuring total reading of journal articles." *D-Lib Magazine*, *12*(10). Retrieved from http://www.dlib.org/dlib/october06/king/10king.html

King, D. W., Tenopir, C., Montgomery, C. H., & Aerni, S. (2003, October). Patterns of journal use by faculty at three diverse universities. *D-Lib Magazine, 9*(10). Retrieved from http://www.dlib.org/dlib/october03/king/10king.html

Levin, D., & Fleeter. (2006, June 22). *Value for money: Southwestern Ohio's return from investment in public libraries*. Retrieved from http://www.ila.org/advocacy/pdf/Ohio.pdf

Lowe, C. (2007, August). Evaluating research from the university administrator perspective," *Library Connect*, 1. Retrieved from http://libraryconnect.elsevier.com/lcn/0503/lcn050304.html

Urban Libraries Council. (2007 January). *Making cities stronger: Public lbrary contributions to local economic development*. Retrieved from http://www.urbanlibraries.org/files/making_cities_stronger.pdf

Matthews, J. (2006, November/December). The Library Balanced Scorecard, is it in your future?" *Public Libraries*, 64–71.

Monroe, W. (2005, November/December). Libraries Return on Investment Study" *Library Mosaics*, Link. (ceased publication with the issue and not web accessible). Link to the Study at the State of Florida website: http://dlis.dos.state.fl.us/bld/roi/pdfs/ROISummaryReport.pdf

Olsen, S. (2003). Social return on investment: Standard guidelines. Center for Responsible Business, University of California Berkeley, Working Paper Series, paper 8. Retrieved from http://repositories.cdlib.org/crb/wps/8

Proenza, L. M. (2007, May 17). Beyond research rankings. *InsideHigherEducation*. Retrieved from http://insidehighered.com/views/2007/05/17/proenza

Strouse, R. (2003, March). Demonstrating value and return on investment: The ongoing imperative. *Information Outlook*, 14–19.

Appendix: Survey

********** **Section 1**

Thank you for agreeing to participate in the UIUC Library Return on Investment Survey.

Purpose
The purpose of the survey is to help us better understand and document the value of library collections in supporting research grants that generate income for the University. The survey has been funded by Elsevier and is being administered by Informed Strategies. The survey results will be used in developing a model for return on investment for the UIUC Library, and the model developed in this research will be shared with other academic libraries.

Survey specifics
Time: About 10–15 minutes, 3 pages
To ensure that your responses are recorded, you must:
Click **"Next"** at the bottom of each page;
Click **"Done"** at the end of the survey.
If you leave the survey before finishing it, you can return to where you left off if you use the same machine.

Espresso gift card
In appreciation of your participation, we will send you a $5 Espresso Royale gift card. At the end of the survey, you can link to a separate site to enter your name and mailing address to receive the card. The personal information you submit: (1) will not be tied to your responses, and (2) will be kept confidential and will not be shared with any nonaffiliated third parties.

Rights to participate
Your participation in this survey is strictly voluntary. You may discontinue participation at any time without penalty or skip questions. For questions about research participants' rights, contact the University of Illinois at Urbana–Champaign's Institutional Review Board at 217-333-2670 or irb@uiuc.edu. Any and all information we receive will be kept strictly confidential and will be seen only by authorized members of our staff. Data gathered from the survey will be summarized in the aggregate, excluding all references to any individual response. The aggregated results of this survey will be used to inform other data sets to help answer our research questions concerning the value of journal subscriptions to academia. The researchers will keep the information you provide confidential. However, the service hosting this survey may have access to the data you submit and your computer IP number. We cannot guarantee that this service will keep information you submit confidential.

********** **Section 2**

1. In what year did you join the faculty at the University of Illinois' Urbana–Champaign campus?

2. How much of your time is spent doing research?
___ None
___ Less than 24%
___ 25 through 49%
___ 50 through 74%
___ 75 through 100%

3. Please indicate the broad subject area that best describes the primary department with which you are affiliated at Illinois.
___ Physical Sciences (i.e., Engineering, Physics)
___ Life Sciences (i.e., Biology)
___ Social Sciences (i.e., Business, Education, Law & Psychology)
___ Health Sciences (i.e., Medicine)
___ Arts & Humanities
___ Other (please specify): _____

4. Please indicate your current position at Illinois.
___ Professor
___ Associate professor
___ Assistant professor
___ Visiting faculty
___ Postdoctoral research associate
___ Academic professional
___ Other (please specify): _____

********** **Section 3**

We are seeking to identify the revenue that faculty generate in the form of research grants.

5. How many proposals for externally funded research grants did you submit in 2006? Please specify the number; if none, please enter 0.
_____

6. During 2006, for how many externally funded research grants were you the principal investigator (PI) or co-PI? Please specify the number; if none, please enter 0.
6a. Total existing grants ___
6b. New grant awards ___

7. Over the last 5 years, please indicate if the number of proposals for externally funded research grants that you have submitted has:
___ Increased
___ Remained the same
___ Decreased
___ Comment: _____

8. What was the approximate total dollar value of the research grants (including indirect cost recovery) that you received as principal investigator (PI) or co-PI over the last 5 years? Please specify the number; if none, please enter 0.
_____

9. Have you received peer recognition or an award(s) for the quality of your research?
___ Yes
____ No
____ Comment: _____

********** **Section 4**

We are seeking to identify the use of library funded resources used in grant-related works.

10. Based on your understanding of the awards process for research grants, how important is it to include references to journal articles or books in grant proposals?

___ Essential
___ Very important
___ Important
___ Somewhat important
___ Not important

11. On average, how many references to articles or books do you cite in each of the following?
0, 1 through 24, 25 through 49, 50 through 74, 75 through 99, 100+

___ In a grant proposal
___ In a final grant report
___ In an article for publication

12. Approximately what percent of the books or journals that you cite in grant proposals, grant reports, or articles for publication were originally accessed while on the campus network or through the University of Illinois Library Gateway?

___ 1 through 24%
___ 25 through 49%
___ 50 through 74%
___ 75 through 99%
___ 100%
___ Don't know
___ Comments: _____

13. In 2006, on average, for each article or book cited in a grant proposal, grant report, or article for publication, approximately how many others did you read?

____

13a. Additional Comments:

14. In 2006, approximately how much time in hours did you spend in an average week:

___ Finding and accessing needed articles and books?
___ Reading articles and books?

14a. Additional comments:

15. If you were reliant on print resources only and did not have access to online content, approximately how much time—in hours—would you expect to spend in an average week:

___ Finding and accessing needed articles and books?
___ Reading articles and books?

15a. Additional comments:

16. How has access to electronic resources available over the university network changed the way you work?

ABOUT THE PROJECT TEAM

PROJECT CONSULTANT

Judy Luther launched Informed Strategies in 1997 to provide market insights to publishers and vendors in developing customer-oriented electronic products and services. Prior to consulting, Ms. Luther was Director of North American Sales for the Institute for Scientific Information (ISI), a Thomson Company, and handled sales and product development for the Faxon Company. Her library experience includes working as the Library Director at Embry–Riddle Aeronautical University and as Government Documents Librarian at Stetson University.

With both an Executive MBA from Emory University and an MLS from Florida State University, Ms. Luther is professionally active in the American Library Association (ALA), the Charleston Conference, the Information Futures Institute, and the Society for Scholarly Publishing (including serving as President). She serves on the boards of UKSG *Serials, Against the Grain, The Charleston Advisor, Journal of Electronic Publishing, and Journal of Electronic Resources Librarianship.*
www.informedstrategies.com

PROJECT PARTICIPANT

Paula Kaufman moved to her current position as University Librarian and Dean of Libraries at the University of Illinois at Urbana–Champaign in September 1999 from the University of Tennessee, Knoxville, where she had been Dean of Libraries since 1988. Prior to taking the position at the University of Tennessee, she served at the Columbia University Libraries as Acting Vice President, Director of Academic Information Services, Director of Library Services, Acting Head of the East Asia Libraries, and Head of the Business Library.

Ms. Kaufman has written and made presentations on a number of issues pertaining to scholarly information, privacy, copyright, research libraries, recruitment, and leadership. Among her recent publications are “It’s Not Your Parent’s Library Anymore: Challenges and Opportunities in the New Webs of Complexity” *(Journal of Library Administration, 46*(1), 2007).

Ms. Kaufman has served the profession with board memberships in the Center for Research Libraries, the Association of Research Libraries (including serving as President), the Council on Library and Information Resources (current board chair), the Illinois Computer Services Organization, the Research Libraries Group, the Society for Scholarly Publishing, and SOLINET (Southeastern Library Network).
http://www.library.uiuc.edu/

PROJECT ADVISOR

Carol Tenopir is a professor at the School of Information Sciences at the University of Tennessee, Knoxville, Director of Research for the College of Communication and Information, and Director of the Center for Information and Communication Studies. Her areas of teaching and research include information access and retrieval, electronic publishing, the information industry, online resources, and the impact of technology on reference librarians and scientists. She is the author of five books.

Dr. Tenopir has published more than 200 journal articles, is a frequent speaker at professional conferences, and, since 1983, has written the "Online Databases" column for *Library Journal*. She is the recipient of several awards, including the 2004 International Information Industry Lifetime Achievement Award. Dr. Tenopir holds a Ph.D. degree in Library and Information Science from the University of Illinois.
http://web.utk.edu/~tenopir/

ELSEVIER PROJECT TEAM

Chrysanne Lowe serves as Vice President, Global Customer Marketing for Elsevier, overseeing the Science and Technology Academic and Government marketing worldwide. This includes Elsevier's Library Relations and *Library Connect*, a global outreach initiative fostering communication and partnership with the library community. Over the past 20 years in the STM publishing industry, Ms. Lowe has been a first-hand participant in electronic publishing, holding key management positions in marketing and sales. Prior to joining Elsevier in 2001, Ms. Lowe was responsible for the strategic development of worldwide licensing and marketing for Academic Press' IDEAL, one of the first electronic journal publishing platforms licensed to institutions by a commercial publisher. Ms. Lowe resides in California and also serves as Head of Office, Elsevier San Diego.

Kira Cooper is Senior Communications Manager in the Global Customer Marketing group for Elsevier, based in San Diego. Her focus is on providing clear communications for librarians through Elsevier's sales organization about topics ranging from initiatives within Elsevier to discussions of industry trends. A publishing industry veteran, Ms. Cooper has filled a variety of bookselling and marketing management roles on both the trade and STM sides of the business. Prior to joining Elsevier in 2006, she was Executive Director of Special Markets and the Internet for Harcourt Trade Publishers.

AUTHOR ACKNOWLEDGMENTS

The administration, faculty, and staff of UIUC, whose help was greatly appreciated
Gail Hodge and Randy Hoffman, Information International Associates
Kimberly Kempf-Leonard, Southern Illinois University Carbondale
Donald W. King
Bruce Kingma, Syracuse University
Karen Schmidt, Illinois Wesleyan University