

The library as strategic investment: results of the University of Illinois Return on Investment Study

Day 1 – Track 3



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Introduction

Around the world, libraries of all types face the challenge of demonstrating their value. This paper focuses on one approach to meeting this challenge in the academic library environment: articulating the return on investment (ROI) that accrues to a university when it invests in its library. While the specific metric chosen to identify at the University of Illinois at Urbana-Champaign—the contribution made by library resources to successful applications for grant funding—may not be relevant in other contexts, the process used to identify it is relevant in any setting.

The University of Illinois has always acknowledged the value of its library. Funding a library collection was one of the first topics addressed at an 1867 meeting of the Trustees of the newly-established Illinois Industrial University and it was at the 1927 dedication of the Main Library Building that University President David Kinley proclaimed the Library to be the “heart of the University”. Illinois is proud of its tradition of excellence in library services and collections but no amount of pride or tradition is enough to shield the library from trends in the information and higher education environments that demand more rigour in demonstrating the library’s value to students, scholars and the state.

Global trends, local context

To appreciate the choices made in designing this study of library ROI it will help to understand the University and the ways in which the issues it faces are representative of broader trends.

The University of Illinois at Urbana-Champaign is the largest of the three campuses of the University of Illinois system. With more than 40,000 students and almost 3,000 faculty members, the campus would be a major presence in the state under any circumstance. Its presence is magnified by its historic mission as a land-grant institution. The term “land-grant” derives from the grants of land that the U.S. federal government made, beginning in the 1860s, to establish in every state institutions of higher education that would be accessible to people from all socio-economic groups. The “Land-Grant Idea” is considered by many to be one of the great American contributions to higher education—a commitment to not only strengthen the country’s economy and its democratic values but also to ensure that these institutions would engage in teaching, research and outreach activities relevant to the needs of the state and the nation. As a land-grant institution, Illinois has developed programmes and services that benefited over 2 million state residents in 2007-08. At the same time, its faculty received almost \$500m in funding for research in science and engineering. These figures alone are

insufficient, however, to demonstrate the value of the institution to the state.

Public support for higher education in the U.S. has declined over the past quarter century. Nearly half of Illinois’ budget came from state funding in 1980; by 2008, that figure had declined to less than 17%. Like other institutions of higher education, Illinois has had to find other ways to meet the funding gap caused by a combination of declining state support and increasing costs. Growing sources of funding include research grants, donations from individuals and corporations, and increases in tuition fees. Increases in what students pay (more familiar to private institutions in the U.S. than to public ones) reflect increased needs for public funds to support health care, public safety, and primary and secondary education, as well as broader changes in public perceptions of higher education as a public good.

Declining public support—financial and political—for higher education, and concomitant increases to tuition costs, have contributed to several of the major change drivers in higher education. These include: insufficient financial resources; rising service expectations; and demands to demonstrate outcomes, also referred to as the call for “accountability”. These issues are global in scope, perhaps none so much as the demand for accountability.

Accountability, like the broader concept of “value,” is not unique to the academic environment. Libraries of all types, and in all countries, are under pressure to demonstrate their value and their contribution to specific outcomes embraced by their schools, institutions or communities. To do so, librarians must identify new value metrics, replace traditional reports of comparative inputs with reports of outcomes and impact, and demonstrate the benefits which accrue to institutions that support their libraries.

In the academic context, the library must represent a competitive advantage—a resource that draws students and faculty to its programmes in a highly competitive higher education environment. Thus, it is important to demonstrate that investment in the library yields a return that contributes to the strategic goals of the institution. At Illinois, those goals include increasing the resources received through extra-mural funding, which in turn requires the successful recruitment and retention of leading scholars and researchers.

Designing the Illinois ROI study

The study’s roots derive from discussions during Spring 2006 between Elsevier and a number of librarians around the world about the idea of finding a formula that would show the return on a university’s investment in its library. Dr. Carol Tenopir, Professor of Information Sciences at the University of Tennessee at Knoxville, was recruited as an advisor to the project. As a member of Elsevier’s North

American Library Advisory Board, the author had the opportunity to volunteer Illinois as the site for the study.

Following a standard Request for Proposal process, Elsevier contracted with Judy Luther of Informed Strategies to conduct the research. From the first, the project benefited from strong collaboration among Informed Strategies, Illinois, and Dr. Tenopir. As project funder, Elsevier representatives sat in on discussions of the research plan, and offered advice and support.

With research beginning in January 2007, the goals of the study were simple (at least in concept): to document hard data demonstrating return on investment and to develop a formula that could be applied at other institutions to demonstrate library value using metrics of universal relevance within the academic community. The goal was to develop a formula that would solve the following variable: "For every dollar invested by the University in the library, the University received x dollars in return." Venturing into uncharted waters, the team did not seek to develop a predictive model; instead it sought to base this formula on real figures, including actual expenditures on library resources and actual funds received by the University from external agencies.

Work began in March 2007, with a discussion between researchers and University administrators, including Provost, Linda Katehi; Vice Chancellor for Research, Chip Zukoski; and Robert Easter, Dean of the College of Agriculture, Consumer & Environmental Sciences. The purpose of this discussion was to understand each administrator's perspectives on the question of the value of the library to the research enterprise. Reflecting some of the broader trends in higher education noted above, these administrators emphasized that the University must foster teaching and research in new fields, support and strengthen interdisciplinary work, explore new sources of financial support, pursue efficiencies everywhere, and connect with the broader communities of the state, the nation, and the world.

Attention was focused on the impact of the research being done on campus; specifically the "fame" that successful researchers bring to the University and the role they and their fame play in attracting new researchers to campus (who, in turn, bring new fame to the campus and maintain the cycle). Ultimately, the University Administration is committed to hiring and retaining the very best researchers. The relationship between the library and this administrative priority dates back at least a century, to when the University President declared that the best way to recruit and retain excellent faculty members to a campus set among the corn and soybean fields of the American Midwest was to build a world-class research library.

This discussion was critical to the design of the study as it highlighted two key requirements. The study must:

- Establish a relationship between the library and strategic concerns of the University that could be expressed in quantifiable terms so as to allow benchmarking and comparison with peer institutions.
- Be designed to elicit support from University administrators, thus ensuring that the administration viewed the library as a strategic asset to the campus.

The clearest way to address these points, it seemed, was to focus on the relationship between investment in library resources and the resources that accrued to the University through their use. Within the Illinois context, the team considered whether a relationship could be established between library resources and competitive extra-mural funding. Put simply, could a link be established between the availability of library resources on campus and successful

competitive grant proposals? Could success in obtaining grant funding demonstrate the return on the University's investment in its library?

After losing the participation of an Illinois economist who misinterpreted a request for his help to be the first step in an argument by which the library would seek to "claim" a percentage of grant funds generated on campus for its own budget, the team clarified what the study was, and was not.

The ROI study was:

- *not* a means of claiming a new revenue stream for the library
- *not* a budget argument
- *not* a cost or time-saving exercise
- *not* attempting to develop a predictive model.

Rather, the goals of the study were to:

- demonstrate that the library and its research collections contribute to income-generating activities essential to the University
- quantify the return on the University's investment in its library
- highlight the library's role in the extra-mural funding process on campus
- demonstrate correlation between the library and grant activities, rather than attempt to prove cause and effect.

The study sought to conduct *ex post facto* research on data representing recent grant activity on campus, not to develop a predictive model. The goal was to explore the return on completed investments, rather than to suggest that those returns could predict how much would accrue to the University as the result of future investments.

Constructing the study

Although there is considerable research being carried out around the world on the question of documenting library value, the Illinois team thinks this study has broken new ground in establishing an ROI formula that can be applied across a variety of academic and research institutions. The remainder of this paper will describe the approach used; readers can decide its applicability for their own settings. A selective bibliography is appended for readers wishing to learn more about other studies of library value.

Keeping in mind the local environment—in which the majority of grant activity is in the fields of science and engineering—the team began with what it knew about access to information in those fields. Scientific literature began moving from print to electronic formats in the mid-1990s, and libraries initiated what would become radical changes in their information access strategy by investing in digital access to scholarly content. Illinois' use data show that its researchers, like users around the world, took to accessing materials online with alacrity. The team also knew that access to information is critical to the grant procurement process in these fields, as grant proposals routinely include a substantial number of citations to previous research. Given that the vast majority of the books, journals, and primary source research materials available at Illinois are made accessible through the library; and an immense amount of digital content has become accessible through the library's gateway (www.library.uiuc.edu) and other resource discovery tools; the team assumed that many grant proposals are materially assisted by the citations to materials that are made available to researchers by the library.

Research on the impact of digital access to content on the work of researchers documented that the research environment had been transformed by the increases in digital access to content which occurred in the early years of this century. A study by Outsell, Inc., showed that advances in digital access to scholarship between 2001 and 2005 had resulted in significant gains in both efficiency and productivity among researchers, with those in science and engineering in particular, gaining additional time for analysis of results by reducing the time required to identify relevant resources and retrieve them by hand.

Developing the model

As noted above, successful grant activity results in new resources being directed to campus by external agencies. It also helps to recruit and retain the best faculty members, especially in critical areas of global competition. Successful grant proposals typically include substantial discussions of the previous literature. Digital access to the literature facilitates the most efficient use of researchers' time—allowing them to substitute time they would have spent gathering information for time they can spend in making the best case to the external agency to fund their research. Given this background, the team formulated the following argument:

1. Investment in e-resources leads to increased productivity among researchers.
2. Increased productivity leads to more grant applications, scholarly output and citations.
3. Each of these, leads in turn, to more grants being awarded to campus researchers, which establishes the environment most conducive to recruiting and retaining excellent faculty.

Despite the recent interest in studies of library value, it was difficult to find an existing research model that could be modified to reflect the academic environment. Following an extensive literature review, focus centered on two reports, both published in 2007, that examined the social and economic benefits that public libraries bring to their communities.

Worth Their Weight: An Assessment of the Evolving Field of Library Valuation presents an overview of library value assessment methods, as well as a summary of the results of 17 public library studies. These studies confirmed that by using econometric tools, public libraries can demonstrate a financial benefit, such as the impact of library employment and library spending, to the communities that fund them. Although the report did not demonstrate a methodology directly applicable to academic libraries, it offered some ideas about how complementary studies might proceed in the future. *Making Cities Stronger: Public Library Contributions to Local Economic Development* argues that public libraries are institutions essential to cities seeking to remain competitive in the global information economy. This study offered a way of thinking about how to position the academic library as an asset to its parent institution.

Two studies cited in *Worth Their Weight*, one conducted in Florida in 2004, and the other in Ohio in 2005, offered ROI calculations. Although useful for background information, none of these models—all of which focused on public libraries—met the team's needs. One study calculated ROI based on the projected cost of not having a library, while the other calculated ROI based on the value of materials circulated, rather than on a broader view of the value of resources made accessible through the library. Neither of these approaches reflected the academic environment.

The team also considered other approaches to this study

(including statistical analysis, productivity measures, behavioural modeling, and contingent valuation) concluding that none of these methods would deliver a single ROI figure based on a relatively straightforward calculation—the kind of calculation needed to make the study useful for its stated purposes. Several of the approaches considered may be useful in future phases of this project. In the end, the team turned to Roger Strouse of Outsell, Inc., and his work on valuing corporate libraries as a starting point for developing its own model.

Strouse demonstrated an approach to the study of “value” that relied on user survey data and he calculated income generated with the use of library resources. Strouse's survey of corporate library users revealed the percentage of respondents who stated that the library played a role in their revenue-generating activities, as well as the percentage of those who actually generated revenue. Using these data, Strouse constructed a formula to calculate the average amount of revenue generated per library use. Using the Strouse formula as its base, the team constructed a parallel model for the academic library environment. To do this, it had to identify the data it would need and the best individuals or offices on campus from which to draw it.

Having constructed a model, the team turned to making decisions about which data to use. First, only tenure-system faculty were chosen to be included in the survey, as they generate 95% of the grants awarded to Illinois. Second, the team had to identify the longitudinal scope of the study. Although the original intention was to include data for the past decade, this proved impossible for two reasons: one year of “bad” data related to the installation of a new tracking system in 2004; and the limitations of library-related systems—in this case the COUNTER system used to track use of electronic serials. COUNTER was too new and had been used too inconsistently over the past decade.

Finally, the team had to choose which library budget figure to use to represent University investment: the materials budget or the total budget for the library? Owing to the fact that the entire library infrastructure, including personnel, facilities and technology, are critical to the processes that allow the library to acquire content and make it accessible to users; and that the data routinely collected for reporting to the Association of Research Libraries does not distinguish among different formats of scholarly literature; the team decided that the more prudent course would be to use the total library budget as the measure of institutional investment.

User perceptions of library value

Based on those decisions, an online survey was distributed to more than 2,000 members of the Illinois faculty on September 12, 2007. The survey instrument focused on user perceptions of the role the library plays in research and grant-seeking activities, and included a variety of item types, including multiple-choice and free text responses. 328 responses to the survey were received, a response rate of 16%. Respondents represented a range of academic disciplines as well as a representative distribution of faculty ranks and time on campus.

Almost 95% of respondents reported that citations to scholarly literature were important, even essential, to their grant-seeking activities. Almost 75% of respondents stated that over three-quarters of the citations they included in their grant applications were accessed through the library. Survey items related to the use of scholarly literature in the grant process engaged most respondents, with over 90% including free text comments on this topic. Other survey items probed the scope of the literature reviewed by faculty:

for every citation used in a grant application, faculty reported reading 4-5 additional items and scanning dozens of abstracts. The overall picture is one in which users made use of a wide array of information resources, selected those most germane to their needs, and recognised that the ability to access these resources through the library was critical to their professional success.

While Illinois' library has long provided access to a wide variety of materials, the survey demonstrated the impact made by enhanced digital access. Echoing Outsell, Inc.'s, earlier study of researchers in the sciences, more than 80% of respondents identified one or more of the following ways in which digital access has had a positive impact on their work:

- Digital access allows them to spend less time physically visiting the library.
- Digital access allows them to integrate scholarly information effectively into their research workflow.
- Digital access and discovery tools allow them to make better use of literature in interdisciplinary and emergent fields of study.

In addition to demonstrating the impact of investment in library resources on the grant-seeking process, the survey demonstrated the impact that libraries can have on fostering efficiencies and promoting interdisciplinary research. Each of these represents strategic goals for Illinois.

Determining the ROI

Satisfied with the results of the survey, the team took the fiscal year 2006 data collected from all sources and entered them into its ROI calculator. (See Appendix A for details of the calculations.)

- More than 78% of tenure-system faculty holding grants in 2006 used citations to the scholarly literature in their proposals.
- More than 50% of grants awarded to campus came from proposals that included citations to materials accessed through the library.
- The average grant income at Illinois is approximately \$64,000.
- Using those numbers in the formula, the average amount of grant income generated through the use of library resources is calculated to be just over \$25,000.
- Multiply the average amount of grant income by the number of grants awarded in 2006 at Illinois, and divide that number by the total library budget during that year to calculate an ROI of \$4.38 for every dollar invested in the library.

By factoring survey responses into this equation, the team did not assume that all grant proposals use references, all references used come from the library, or citations to scholarly literature are essential to the success of all grant proposals. The result is a model that takes into account the way users report they make use of library resources in their work, as well as the widely differentiated landscape of grant funding.

It is also important to note again that the total library budget (and not just the materials budget or the serials budget) was used to calculate the ROI. This ensures that the model takes into account costs such as network infrastructure, personnel, and other overhead activities that enable electronic access for campus researchers. If the materials budget, rather than the total budget, had been used, the ROI would have been approximately \$12.

Finally, to ensure the validity of these results, Dr. Bruce Kingma of Syracuse University was consulted for an

independent assessment of the research methodology. In addition to validating the model, Dr. Kingma provided a number of useful insights into how this study could be expanded in the future by including other universities, considering other benefits the library brings to the University, and developing a predictive model that might demonstrate what impact additional investments might have on research (or other) activities.

Returning to the initial meeting with University administrators, this study demonstrates the value that investment in the library brings to campus priorities. The survey, in particular, suggests the degree to which a strong library contributes to the goal of recruiting and retaining excellent faculty; as one respondent noted: "I would leave this university in a microsecond if the library deteriorated."

Next steps

What comes next? This study focused on one institution and one year. It seems to this author that there are several opportunities to learn more about how to construct a robust and reliable statement of the return on the University's investment in its library.

The Illinois study focused on a single institution, but applying the ROI calculator to multiple institutions and gathering longitudinal data would allow the identification of trends and establishment of benchmarks. Comparative research might also reveal institutional factors, including organisational culture, that contribute to an enhanced ROI. Elsevier has already begun a study that will calculate ROI on the library's contributions to successful competitive grants in about a dozen institutions around the world.

The Illinois study focused on a single data point: library contribution to the generation of grant funds. Expanding the scope of revenue-generating activities such as patents and technology-transfer programmes, as well as other relevant revenue streams, should prove fruitful. ROI studies focused on revenue generation may complement the much more complex studies of library contribution to student learning outcomes, civic engagement, and campus relations with local, state, national, and international communities that eventually must be undertaken. Determining the value of the library to its institution is a complicated problem; the Illinois ROI study is just one step in the right direction.

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Appendix

# Tenure System Faculty	2045	
# Principal Investigators	1700	*Survey Q11 - 94% faculty use citations in grant proposals
A) = % of faculty using citations in grant proposals*	78.14%	(1700x94%)/2045
# Grant proposals	2897	**Survey Q12 - 94% proposals include citations that are obtained via campus network/Library Gateway
# Grant awards	1456	**Survey Q10 - 95% faculty state citations important or essential in grant awards
B) = % proposals inc citations obtained through library**	50.79%	(1456x95%)/(2897x94%)
\$ Average size grant	\$63,923	
C) = \$ proportion of grant \$ secured using library materials	\$25,369	(78.14%x50.79%x\$63,923)
# Grants (expended) in year	6232	
D) = \$ proportion of grant income using library materials	\$158,099,608	(\$25,369x6232)
\$ Total Library Budget	\$36,102,613	
E) = University return in grant \$ on library	\$4.38	(\$158,099,608/\$36,102,613)

Slide 1

The library as strategic investment: results of the University of Illinois Return on Investment Study

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Slide 2

Study's Objective

**For every \$ spent on the library,
the university received 'X' \$ in return.**

- Articulate value in terms of institutional objectives
 - Measurable effects
 - Replicable
 - Meaningful & compelling

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Slide 3

Administration Values

- Focus on new intellectual directions
- Strengthen interdisciplinary work
- Find resources
- Connect with community, state, nation, globally
- Efficiency in all we do

**"Funding does not regenerate funding.
But reputation does."**
- Charles Zukerkl, Vice Chancellor for Research

- **Increase impact of university's research**
 - Attract & retain outstanding faculty

Faculty = Funding

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Slide 4

Quantifying for the University

ROI:
Income as a proportion of the amount invested in an asset.

Faculty generate income for the institution. Faculty use the library and its collections. What role do information resources serve in the income generation process?

% of grant \$ using library resources
÷
library budget \$
= "X"

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Slide 5

Explaining the Study

- **Not** trying to claim an allocation back to library!
- **Not** a budget argument
- **Not** a cost/time savings exercise
- **Not** creating a predictive model
- **Demonstrate** that library research collections contribute to income-generating activities
- **Quantify** a return on University's investments in its library
- **Focus** on library's role in externally funded research process
- **Show** "correlations" rather than prove "cause-&-effect"

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Slide 6

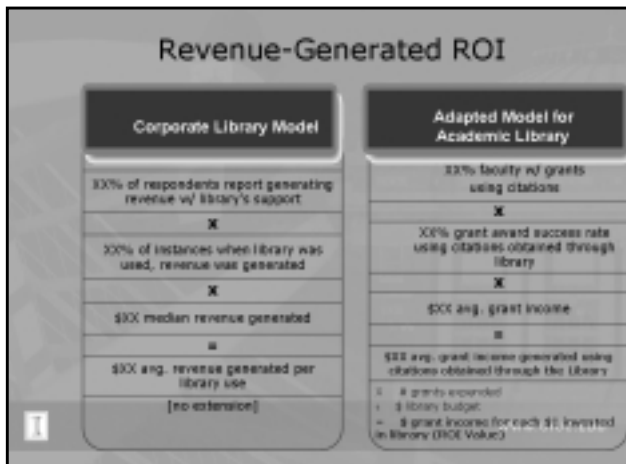
ROIs for Public Libraries

- **Reports**
 - *Worth Their Weight* - Americans for Libraries Council
 - *Making Cities Stronger* - Urban Libraries Council
- **Examples**
 - Southwestern Ohio: \$1 = ROI \$3.81
 - Florida: \$1 = ROI \$6.54
 - ROI Calculator:
<http://www.lrs.org/public/roi/calculator.php>

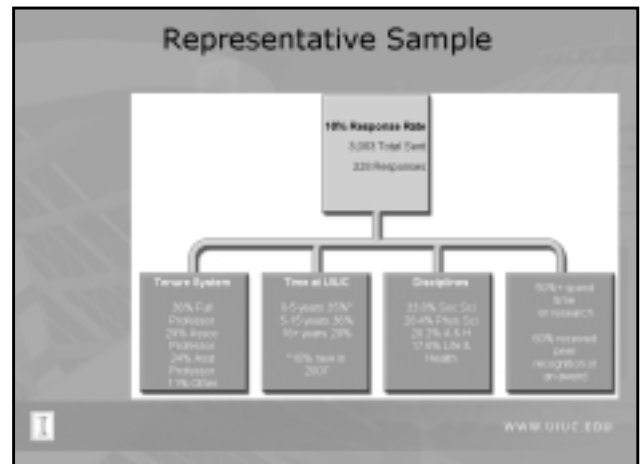
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Library Research Service, Peer-Based Forum: An Investment Calculator

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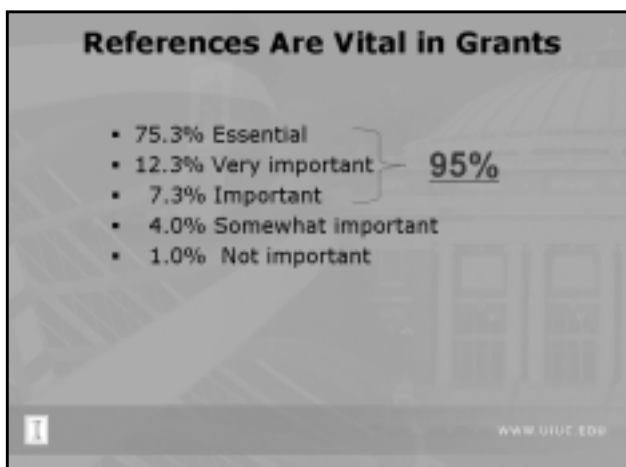
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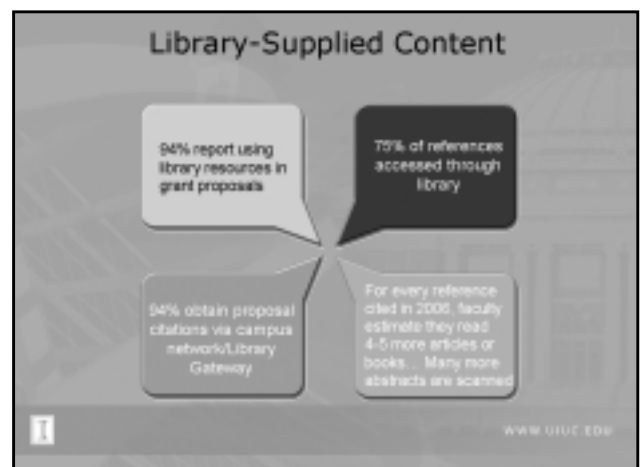
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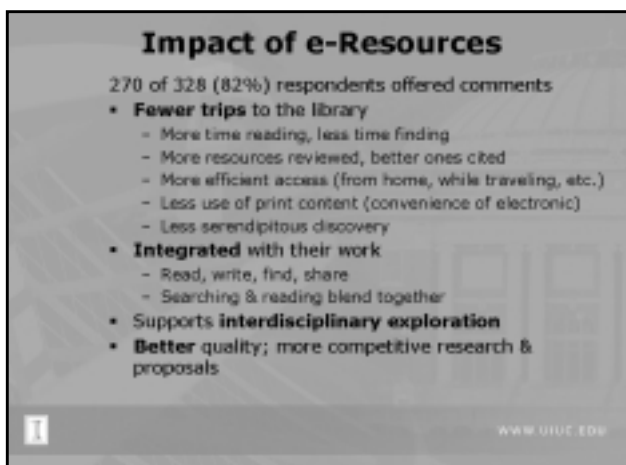
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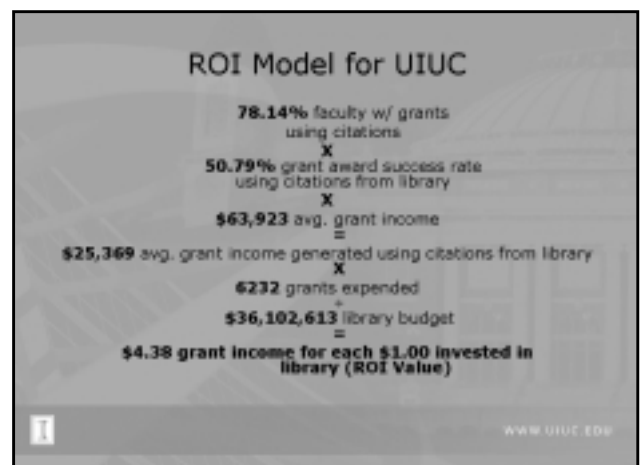
Slide 10



Slide 11



Slide 12



Slide 13

Administration Values: Measuring Up

- **Attract & retain outstanding faculty**
- **Increase impact**
 - 28.8% more articles per tenured faculty
 - "Faculty with more publications and citations have higher propensity of obtaining more grants."¹⁶
 - "Faculty who read more articles tend to receive awards."¹⁷ (Donald W. King, IIRJ South, 2004)

"I would leave this university in a microsecond if the library deteriorated ..."

*As a Distinction, "Research Grant and Faculty Productivity: Survey, Relationship among Research Institutions," Academic Analytics

Slide 14

Next Steps?

- **Implement with multiple institutions?**
 - Determine benchmarks
 - Assess trends
 - Challenge: Model dependent on survey to validate use
- **ROI for patents and tech transfers, other income?**
- **ROI for teaching?**
- **Valorization?**
 - Calculate impact to local/community economy
 - Countrywide analysis
- **Predictive model?**

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Slide 15

THANK YOU

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Slide 16

Calculations Used in the Model

# Tenure System Faculty	2045	
# Principal Investigators	1700	¹⁶ Survey Q11 - 84% faculty use citations in grant proposals
A) = % of faculty using citations in grant proposals ¹⁶	78.14%	(1700*0.84)=1430
# Grant proposals	2897	¹⁷ Survey Q12 - 94% proposals include citations that are obtained via campus network/Library Systems
# Grant awards	1450	¹⁷ Survey Q16 - 50% faculty state citations important or essential in grant awards
B) = % proposals inc citations obtained through library ¹⁷	50.70%	(1450*0.50)=727.5
\$ Average size grant	\$63,923	
C) = \$ proportion of grant \$ secured using library materials	\$20,369	(727.5*0.32)=234.9
# Grants (expended) in use	6232	
D) = \$ proportion of grant income using library materials	\$150,099,600	(6232*24090)=150,900,000
\$ Total library budget	\$26,302,613	
E) = University return in grant \$ on library	\$4.28	(150,099,600/35,000,000)=4.28

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