Build It and What? Measuring the Implementation and Outcomes of an Information Commons

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Introduction

If you are thinking about implementing an Information Commons at your library—and who isn't at least thinking?—what should it look like? What do your patrons want and need? How will you find out? And then… what difference will it make?

The following describes several methodologies available for librarians to explore, on an individualized basis, what their own patron base wants, needs, and will benefit from. This includes the use of output data to guide design, and outcome data to explore the effects, of an information commons installation. These methodologies were used in the design and implementation of an information/academic commons area at the University Library (UL) of Indiana University Purdue University Indianapolis (IUPUI).

IUPUI in many ways is a balkanized campus: various "schools" affiliated with either Indiana University or Purdue University, with separate enrollment, teaching, and research endeavors offer a variety of degrees, and enjoy (or are burdened with) significant financial independence. The library is one of the services for which each "responsibility center" is taxed.[1] Because it serves the entire campus, it is one of the most visible symbols and realities of the campus as a whole, and part of the building's façade is incorporated into the campus logo.

The 30,000 students the UL serves in this urban setting are almost entirely commuters and largely part-time. Like professors elsewhere, but especially on a campus dedicated to workforce development in the central part of the state, IUPUI faculty with an eye to preparing students for a future workplace have incorporated technological and information-rich group work projects into their courses—a development documented in library exit surveys through the years.[2] Like libraries elsewhere, the UL, with a strong emphasis on technological leadership, is determined to provide the physical tools and intellectual services, the library-as-place learning environment, which will serve those student needs.

Starting in the fall of 2005, the UL took an evidence-based approach to the design and development of new "academic commons" areas in their building. Using space freed by reducing current print periodical shelving, a 40-seat area was designed with a variety of computer workstation arrangements. This was studied with observations via security cameras, surveys of users at all computer stations, and select interviews. Information from these different sources provided important

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and surprisingly consistent data for furniture and technology designs for the next phase of construction, in summer of 2006, in areas freed by the consolidation of the reference collection and removal of more conventional tables and chairs.

In addition, in spring 2006 an exploration of the impact and outcomes of the pilot phase was undertaken. This took two forms. The first involved examination of existing usage data streams: programs ("keytrapper" software), services (question-type tallies), and databases (vendor reports). The second involved examining students working on group and individual projects for their use of the Commons area and their outcomes in terms of technology and information incorporated into their projects.

Many of these methodologies are similar to those used in other evaluations of information commons. Researchers have published studies using interviews with student workers,[3] anecdotal information,[4] the number and proportions of various types of questions received,[5] and surveys.[6] Unpublished evaluations have included these methods plus focus groups, and observations.[7] Data about the library operations in general has been drawn upon to detect an IC influence: library satisfaction, circulations, and gate-count.[8] One goal of the present research is to determine which among these methodologies is the most useful.

Pilot Design Evaluation: Surveys, Observation, Interviews

There were two primary and one supplemental method of investigating the pilot area. The primary method of capturing student self-reports of library use and opinions was a "pop-up" survey; an observation using webcams captured actual behavioral choices. Interviews with a few users provided richer, but in the end, largely confirmatory, data.

Surveys

The process of surveying UL users involved three parts: question construction, technological administration, and sampling.

Questions covered four main areas:
• How and why patrons chose their current computers, including location or services available,
• What patrons knew about the Commons area,
• Whether they would use the Commons area in the future, and
• What services they would like to see added.
Questions about services available or what people

knew about the Commons emphasized the three signature aspects of the information commons design: availability of information assistance (reference), computer assistance, and group work areas.

For technological administration, the Zoomerang survey service was used in an on-login mode. When the survey was "on," every user of a UL computer was presented with the Zoomerang survey in the place of the usual default screen, the library web page. Using Zoomerang had several advantages. First, it allowed incorporation of pictures into the screen design. All surveys are to some degree marketing or educational tools—having pictures of the new Commons area on the survey's first page meant that respondents knew exactly what was being talked about, even if they were relatively ignorant until that point. Second, Zoomerang automatically captures responses, including open-ended text, into Excel spreadsheets for easy analysis.

Sampling was accomplished by a variation on random stratified cluster sampling. For the last six weeks of the semester, each day was divided into three equal time periods: morning from 8 a.m. to 1 p.m., afternoon from 1 p.m. to 6 p.m., and evening from 6 p.m. to 11 p.m. "Weekdays" were defined as Monday to Thursday and "weekends" as Fridays through Sundays. Using the Excel randomization function, hours were selected. Library IT staff turned the survey "on" and then "off" for those hours. Participation in the survey was, naturally, voluntary; anyone could exit from the browser screen at any time. Based on normal library usage patterns, it is estimated that the survey had an overall completion (return) rate of 30 percent of patrons using computers during the time periods.

There were several weaknesses:
• Zoomerang servers were located in California and employed Pacific time zone stamps. This needed to be adjusted—especially in Indiana that fall.
• Turning the survey on and off required human intervention. If only one or two staff members can do this, the random sampling of evening and weekend hours can be a problem. It was thought that a low return rate might have been due to the one-hour time period but when it was extended to two hours in spring semester, the return rate was the same.
• The survey could not itself identify the originating computer. Library staff put red arrows by the (existing) computer identification numbers. Respondents were asked to supply the number (thus the location) of their computer at the beginning of the survey. Approximately 10 percent failed to give an accurate number.

• The survey included only library computer users, leaving out non-computer users, and non-library users. Some of this was addressed in the spring student project surveys.

The major findings of the surveys were these:

• Most people chose a computer out of convenience.

• Most desired a group study room for group projects.

• Few considered services (either reference or computer).

Table 1: Seating Choice		
Why they chose that computer	Number	Percent
Convenience	102	48%
Other	46	22%
Only computer available	38	18%
Quiet zone	23	11%
Librarian available	2	1%
Academic commons	1	0%
Total	212	
Not sitting at first choice:	51	24%

Table 2: Choice for Group Project Workspace		
For group project, would use if available	Number	Percent
Group study room	105	54%
AC area	33	17%
Elsewhere on campus	31	16%
Other	19	10%
Rehearsal room	6	3%

Table 3: Reasons for Using Commons	
These reasons would be important:	
Convenience	128
Group work	91
Reference	45
Computer help	39
Other	17
Respondents could choose multiple reasons	

The results may seem disheartening to librarians, but they reflect important realities that include a role for a well-designed physical space. First, group work areas can provide important features of group study rooms (which few institutions are in a position to add). These include dividers and furniture arrangements which give a sense of privacy and cut down on noise. Second, students spend a great deal of time on academic projects, and for only a portion of that time do they need active intervention with librarian or computer consultant services. Providing effective spaces for the majority of their work time is a valuable contribution of the library to their learning. If students need a "study hall"—why cannot the library provide one that is effective and convenient?

Finally, however small the number of survey respondents who listed librarian services as valuable, it outnumbered those who named computer consulting. If librarians fear that a feature of "commons," the common provision of computer and reference services, might lead technology to crowd out information services, this data suggests otherwise.

Observation

As an urban public university, the UL had always had a concern for patron safety and already had installed security cameras, with signage warning of their use. Camera images went to security monitors, and could be fed to a server. For the fall study period, footage from three cameras that covered about 85 percent of the pilot Commons area was randomly sampled. Using the same stratifications as the survey (morning, afternoon, evening, weekday, weekend), three hundred five-minute time slots were selected and reviewed for where students were working, and if they were working in groups.

There were several advantages to this method. It did not depend upon patron compliance, so it achieved a 100 percent return rate. Because the footage was stored, reviewing it could be scheduled at a time of the research team's convenience. It captured actual actions, rather than a survey respondent's guess about where he or she was, or what he or she might choose.

One of the main goals of the observation was very practical. The pilot area incorporated several different table, computer, and chair configurations. The observations showed which were most used, and how they were used. This information was critical for designing the full implementation, though it would not necessarily be generalizable to "student" populations elsewhere.

Some of the major findings were:

• Counter-high work areas were just as popular as desk-high areas. (Chairless counter-high computer stations intended for quick look-ups had been largely ignored).

• Group work was most common in the late afternoons and on Sundays, and increased significantly in the last two weeks of the semester.

• Areas originally considered to be ready for 3-person groups were too small in most cases. Only when all areas were full would a three-person group choose the 3-person stations.

• Room is needed for "stuff." College students, particularly commuters, and particularly later in the season, have coats and backpacks. This means designers need to consider far more acreage for library spaces than for office spaces.

These results affected the design of the full implementation. The major decision was to provide areas that were both ample and flexible. In essence, the pilot design had one patron taking up a space designed for three; the full implementation had one person taking up a space designed for two people, with the ability, using moveable tables, to increase density to 3 to 5 users when late in the semester. Shelving was provided for "stuff" so that it did not take up seating areas.

Interviews

Fifteen library users were approached (eight in the Commons area and seven elsewhere) and participated in brief interviews. As in most interview situations, this is a too-small number to allow generalizations, although it achieved an 88 percent return rate, with only two people refusing interviews. It proved most effective to approach students as they first sat down at a computer. It takes long enough for a computer to boot up that chatting briefly does not disturb the students' plans.

There were two advantages of this method. The first was that it gathered comments broader and deeper than survey responses. The second is that it included non-computer users.

Most of the comments reinforced what would be the results of the survey. Students were enthusiastic about the new area. They liked both quiet (for other people) and privacy (so they could talk). They mentioned the importance of power outlets for laptops (the UL has wireless throughout).

Impact Evaluation

This evaluation still should be considered preliminary, as at the time only the small pilot area was available. The goal here was to identify if possible some differences that could be attributed to the presence of the Information Commons area. The first part was to see if various usage patterns differed; the second to see how student use of the areas correlated with their academic work.

Usage: Programs

The UL employs keytrapper software to record usage. For each registered computer, it notes the beginning time, ending time, and total time for each program (application) used on the computer. This is recorded locally, in seconds. This data was analyzed to see if program usage differed for computers in the Commons area.

There are advantages and disadvantages to this method. One advantage is that it records all usage without any patron involvement, thus achieving a 100 per cent return rate. It produces immense amounts of data. The data is computer-specific, allowing a fine degree of control and detail. The licensing-based cost is dependent on the number of computers involved.

There are two main limitations. The first is that only Internet Explorer is recorded, not usage of particular databases or web pages. Thus it cannot give any detail about what is a large proportion of library computer usage. The second is that the data is equipment—but not location—specific. That is, if a computer is moved (for repairs or rearrangement), the data cannot reflect that. Some computer stations cannot be measured because they have been occupied by different equipment. The pilot Commons area had the same equipment throughout the first year but this will not be the case in the future.

This data was examined for September 2005 and April 2006. This analysis showed several distinct differences in program usage, comparing four Commons computers to four non-Commons computers.

• Internet Explorer use represented a larger proportion of time spent in non-Commons areas compared to Commons area computers.

• Microsoft Excel was more heavily used in the Commons area than in the non-Commons area.

• When the "help desk" (instant chat with reference) program was used in the non-Commons area, the length of time spent was over 11 minutes, while in the Commons area it was less than one minute.

In general, this data suggests that patrons in the Commons area are more task-oriented, and have ready access to services.

Usage: Question Tallies

Library staff kept detailed question tallies. The library's service points did not change location—in effect, the Commons area brought users to the librarians, rather than librarians to the users. One computer consultant was added to the Commons area. The data compared here was from two periods: pre-Commons development, November–December of 2004, and pilot-development, November–December of 2005.

Question tallies have the usual problems of reliability (consistent recording) and validity (match between what is recorded and what actually goes on). A surprising finding was that the number of reference questions overall declined 20 percent. However, this decline was not as small as two other declines which might be reasonably related to the Commons development: maintenance (equipment) questions declined 26 percent, and referrals declined 51 percent. It is important to understand the comparative context.

Usage: Database usage

For this study, a pre-Commons versus pilot-Commons comparison was made of database usages provided by selected vendors (Counter-compliant). All of 2004 (all pre-Commons) was compared to all of 2005 (one semester of pilot Commons). The statistic for "full text use" was used.

The overall context is shown by increases in the use of two broad, core databases: Ebsco Academic Search Elite which increased 14 percent, and Business Source Premier, 11 percent.

Just as librarians encourage the use of library databases in comparison to generic Google searches, reference assistance may influence the use of more specialized versus more general databases. Comparing 2004 to 2005, the most important, more specialized, databases saw significant increases ranging from 16 percent to 130 percent. Even the smaller increases were larger than the increases for the more general databases.

It is of course questionable to attribute all or even most of this to the presence of the Commons. But the Commons idea presumes that providing convenient reference assistance is a benefit to library users. It is not unreasonable to think that it might influence those users' information choices.

Outcomes Evaluation

Much consideration of Information Commons centers on design, input and process factors. These are essential building-blocks: if patrons don't use a new area, then it won't

benefit them. But merely proving that they use an area does not capture what kind of outcome it has achieved.

Outcome evaluation is a core goal of the academic assessment and accountability movement. Inasmuch as academic libraries are indeed academic, they are called to participate in this effort to determine just what student learning outcomes have been achieved. For libraries this is very challenging, as they serve an assistive, not a direct, role in learning.

Supported by a grant from a learning environment program, a small study was conducted in spring of 2006. This consisted of two parts. In one, students described their place and services usage for their projects. In the other, those projects were scored on elements of information and technology usage, and those scores were compared to place and services reports.

Eight courses were deliberately selected to participate in this project. Four were graduate classes, with group project assignments: two library science and two social work. Four were undergraduate: two business communications sections with group projects, and two history courses with individual projects.

Surveys

In each selected class, students spent about ten minutes filling out surveys. The survey had two sections. The first asked what percent of overall project time students spent in various locations, such as their classrooms, the library, a residence, or elsewhere on campus. Also, of the time spent in the library, it asked what percent was spent in the Commons or other areas. Second, a series of questions asked if students had ever (never, once, or several times) asked for help with information or computer hardware or software.

The major limitation was the small number of classes involved. These cannot reflect an entire campus population, although it is important, for feasibility's sake, to focus one's efforts on classes involving major information-heavy projects. A second difficulty came in the question about percent of time. This wording was selected so students wouldn't feel that they needed to report (or admit to) specific quantities of time. However, almost half of respondents provided answers that did not add up to 100 percent.

The survey's descriptive data were both encouraging and discouraging. Not one graduate student admitted to having asked for information assistance (or computer assistance). However, 40 percent of undergraduates had asked for information assistance (only 18% reported asking for computer assistance).

In space/facilities usage, the average student with an individual project reported spending 33 percent of project time in the library, of which 12 percent was spent in the Commons area and 32 percent in the rest of the (un-remodeled) reference area. The average student working on a group project spent 24 percent of project time in the library, with 33 percent of that in the Commons area and 20 percent in a group study room.

Project scoring

Projects were collected from instructors, with student names removed. If students wished to participate in this part of the study, they provided a code word (the project's title or topic) on their survey. This allowed project scores to be matched with survey results while preserving confidentiality.

This section of the research was more challenging. It depended on cooperation from instructors to gather the projects and a team of faculty and librarians to score them according to a rubric. About half of projects were received electronically; for the large business classes, the instructor made the paper copies available and they were scanned into pdf files.

Two faculty members and three librarians scored the projects on scales of 1 (poor) to 4 (excellent) for information use and for technology use. Some projects were originally in Word, some in Powerpoint, so the technology use scale was worded very broadly. Despite this challenge to reliability (consistency), sixteen projects were successfully scored, where three judges gave scores that either were the same or differed by only one point (the average score was used). These (group or individual project) scores were then matched to survey data.

The results tend to show that library and Commons usage can be associated with positive outcomes, for undergraduates. For graduate students, the only statistically significant findings were negative correlations between the percent of time spent in the library and their information (-.63) and technology use (-.53) scores.

Table 4: Project Scoring Instructions
Information Use Score
4 – Student(s) gathered information from a variety of quality electronic and print sources, including appropriate licensed databases. Sources are relevant, balanced and include critical readings relating to the thesis or problem. Primary sources were in
3 – Student(s) gathered information from a variety of relevant sources—print and electronic.
2 – Student(s) gathered information from a limited range of sources and displayed minimal effort in selecting quality resources.
1 – Student(s) gathered information that lacked relevance, quality, depth, and balance.
Technology Use Score
4 – The project employs a particularly creative use of the technology, incorporating both usual features and also some advanced features.
3 – The technology very adequately conveys the project ideas, using all major relevant features of the technology, and any errors do not significantly detract from an appreciation of the project ideas.
2 – The project ideas are conveyed adequately with the use of the technology, but there are noticeable errors or omissions of relevant technological features.
1 – At least some use of the required technology, but only some aspects, and with significant errors or omissions that interfere with understanding the ideas conveyed.

However, for undergraduates, there was a positive correlation between asking for help and information (.35) and technology use (.41) scores.

The numbers involved and the pilot aspects of project scoring and facilities-usage surveys mean that these results are very preliminary and tentative.

It is challenging but important to go beyond simply asserting that a library service or resource is of benefit. It seems plausible to assume that librarians developing new spaces must have an underlying, even if largely untested, theory, that an information commons is a more effective learning environment than the old reference areas and computer labs. Surveying users, and examining what they actually do and achieve, seems a useful perspective for at least part of what librarians want to know about Commons (and other library) areas.

Comparisons of Methodologies

How useful and informative are these various methodologies? Much depends on local circumstances. These are some thoughts from this project.

Observation webcams provide the biggest bang for the buck: a lot of information on physical facilities use for the easiest staff effort and the greatest compliance;

they miss non-library users. Obviously, these are most useful (and inexpensive) when already in place.

Interviews give richer information but this information may not be needed as it may just duplicate survey information. Interviews require a lot of effort and usually involve too few respondents to allow generalization.

Pop-up library computer surveys take little staff effort and provide detailed information. They have a low compliance rate and miss non-library users; the licensing fee is relatively minimal (under $1,000).

In-class paper surveys capture non-library-users and have high compliance rates. They require a little more staff effort to input data.

Keyserver software costs a relatively large amount (over $2,000) in licensing fees and needs a fair amount of manipulation/analysis. It has complete compliance—as long as computers aren't moved!

Database usage is easy to collect and has full compliance (for project-counter compliant vendors), but may not be available in useful time segments and can be difficult to interpret.

Question tallies are moderately easy to collect (especially if the practice is already in place), and are both good and bad in terms of compliance, as it is very possible that there is could be a systematic bias in the types of questions being recorded or not. Results can be difficult to interpret.

Project scoring requires a great deal of staff effort and faculty cooperation. The data is closest to the ultimate desired outcome, but is difficult to provide reliably.

Based on this experience, libraries experimenting with design can get the most information from web cameras (supplemented with paper or electronic surveys), and those exploring student uses and outcomes can use in-class surveys.

Notes

1. "RSM" is described in Gayle, Dennis, Bhoendradatt Tewarie, and A. Quinton White. "Governance in the Twenty-First-Century University: Approaches to Effective Leadership and Strategic Management." ASHE-ERIC Higher Education Report 30.1 (2003): 1–139. Because it entails large degrees of autonomy (though within the usual tight budget) it impacts library decision-making processes.

2. Stamatoplos, Anthony, and Robert Mackoy. "Assessment of User Response to IUPUI University Library: 1999–2003 Studies, Report to David Lewis of IUPUI University Library." Indiana University Purdue University Indianapolis, 2003. Unpublished. Available at: http://hdl.handle.net/1805/415.

3. Jager, Karin de. 2004. "Navigators and Guides: The Value of Peer Assistance in Student Use of Electronic Library Facilities." *VINE: The Journal of Information and Knowledge Management Systems* 34 (3): 99–106.

4. MacWhinnie, Laurie A. 2003. "The Information Commons: The Academic Library of the Future." *portal: Libraries and the Academy* 2003 (3): 2.

5. MacWhinnie, ibid.; Beatty, Susan. 2003. "The Information Commons: Strategies for Integration." In *Information and IT Literacy: Enabling Learning in the 21st Century*, edited by A. Martin and H. Rader. [London]: Facet Publishing Co.

6. Wong, Sandra, and Anne O'Shea. 2004. "Librarians Have Left the Building: Ask us HERE! at Simon Fraser University." *Feliciter* [Canadian Library Association], 2004, 90–92; Nikkel, Terry. 2003. "Implementing the Dalhousie Learning Commons." *Feliciter*, 2003, 212–14; also Beatty, 2003.

7. See Haas, Leslie, and Jan Robertson. 2004. "The Information Commons." *SPEC Kit 281*. Washington, D.C.: Association of Research Libraries Office of Leadership and Management Services.

8. Bailey, D. Russell. 2005. "Information Commons Services for Learners and Researchers: Evolution in Patron Needs, Digital Resources and Scholarly Publishing." In *IN-FORUM 2005: 11th Conference on Professional Information Sources*. Prague; and Beatty, 2003.