Developing the ‘Understanding Library Impacts’ protocol: a method for detecting and communicating academic library contributions to undergraduate student learning outcomes
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Introduction

Higher education institutions are under tremendous pressure to demonstrate evidence that undergraduate students are learning in college. While their parent institutions are developing ways to respond to these pressures, academic libraries still lack adequate tools for communicating their contributions to student learning. The Understanding Library Impacts (ULI) protocol is designed to fill this gap. The ULI protocol is a new suite of instruments for communicating library contributions to undergraduate student learning outcomes. This study is designed to evaluate the protocol and provide participating libraries with actionable data to support internal improvements and advocacy.

The ULI protocol features a critical incident survey for exploring student information and library use during high-impact academic experiences. A curriculum mapping component connects student use of the library to learning outcomes associated with academic work and to external student learning outcomes frameworks. The protocol was initially developed using qualitative methods in two separate studies and converted to a survey format.¹ The survey was refined in a pilot study at two sites during the spring of 2011 and the dissertation study will take place at four U.S. colleges and universities during the fall of 2011. Undergraduate students majoring in history constitute the study population.

Problem statement

In these times of tight budgets and high expectations for higher education, U.S. colleges and universities are increasingly expected to communicate to their stakeholders that the value of an undergraduate education is worth its cost. College access, retention, and graduation rates are important measures, but evidence of student learning in college is arguably the gold-standard in higher education accountability today.² As colleges and universities grapple with this challenge, libraries are also seeking
ways to communicate their contributions to undergraduate student learning. The recently revised draft

_Standards for Libraries in Higher Education_ from the Association of College and Research Libraries (ACRL)
signals the importance of this issue for academic libraries.³ The first principle in the revised standards,
_Institutional Effectiveness_, states that:

- “Libraries define, develop, and measure outcomes that contribute to institutional effectiveness
  and apply findings for purposes of continuous improvement.”⁴

The library profession has made significant progress in user-oriented assessment and evaluation
in recent decades, but our current methods are inadequate for connecting library use – in all its forms –
to student learning outcomes. For example, satisfaction and service quality are indirect measures of a
library’s influence on student learning.⁵ Retention is an important measure for higher education and
libraries should seek connections to this metric. But retention is an aggregate student outcome
measure, not a learning outcome metric.⁶ Several GPA-based studies have shown promise but it is
difficult to know if students who use the library make better grades or if students who make better
grades are more likely to use the library.⁷ As the saying goes, ‘correlation does not imply causation.’
Information literacy (IL) outcomes have been promoted as a key measure of a library’s contribution to
student learning. IL skills are integral to undergraduate education, but they are not the only outcomes of
importance to stakeholders nor are they the only contributions libraries make to student learning.
Further, IL skills are closely related to broad abilities like critical thinking, making it difficult to assess
these skills independently, let alone isolate the library’s influences on these outcomes.

**Methodological considerations**

Libraries need tools for linking student use of the library with institutional goals for
undergraduate outcomes. The _Understanding Library Impacts_ protocol (ULI) addresses this challenge in
its choice of metrics, units of observation, and research methods.
Choice of metrics

The ULI protocol does not assess student learning directly; teaching faculty in the academy fulfill this role. Instead the protocol links student information behaviors with locally defined learning objectives at the course and program levels within the academic major. In a ULI study, the participating library does not define student learning outcomes and metrics, but connects its activities to the teaching and learning mission of its parent institution.

While locally defined learning outcomes have primacy in a ULI project, the protocol also links library use to two broader student learning outcomes frameworks important to higher education stakeholders: the VALUE rubrics and the Tuning outcomes for History. The 15 VALUE rubrics were created by the American Association of Colleges and Universities to guide assessment of broad abilities expected of all college graduates and cover a range of abilities such as critical thinking, inquiry and analysis, writing, and quantitative reasoning. The Tuning outcomes represent discipline-specific expectations for learning outcomes for history majors. The Tuning outcomes used in this study were generated through a consultative process including faculty, recent graduates, and employers in Indiana in 2009. The ULI protocol links library use to these frameworks allowing libraries to communicate contributions to student learning within and across institutions.

Units of observation

The ULI protocol selects the capstone experience and upper level coursework in the academic major as its focus. This choice is supported by findings from the literatures of college impact and information seeking and use (INSU).

Students majoring in the arts and humanities, the sciences, and the social sciences acquire different bodies of knowledge and learn different analytical techniques. There is evidence that learning activities, reward structures, and norming influences vary by discipline, suggesting the academic major plays a significant role in shaping expectations for student learning outcomes and the pathways by
which they are achieved. It stands to reason that students’ information behaviors should also vary by academic major, and assessment tools should be sensitive to these differences.

Capstone courses are culminating experiences for undergraduate students in which they complete a project “that integrates and applies what they’ve learned” in college. Faculty expectations are at their highest and student effort should be at its peak during the capstone experience. Studying student information behaviors during these times should yield valuable data about library impact for several reasons. First, there is ample evidence that the time and energy students devote to college is directly related to achieving desired learning outcomes. Students who work hard learn more. Furthermore, students exposed to high-impact practices such as capstone experiences are more likely to engage in higher order, integrative, and reflective thinking activities. Finally, there is strong evidence that student learning is best detected later in the academic career.

The literature of information seeking and use also supports selecting a “work task,” such as an academic project, as the focus of a ULI study. Research has shown that in some contexts individuals do not distinguish information uses from the work tasks in which they are engaged. Task complexity has also been shown to be a factor influencing information seeking behaviors. Several models of information seeking and use and methods for their study call for taking into consideration the context of use when studying information behaviors. These findings suggest that studying information behaviors related to work tasks like the capstone project will be more likely to generate evidence of impact on student learning than studying isolated information use transactions.

**Choice of research method: The Critical Incident Technique**

The Critical Incident Technique (CIT) is a research method well-suited to this type of research problem. Formalized by John Flanagan, the CIT has been described as a systematic method of learning from observations of human behavior to derive a general understanding of a given activity, like student learning. Participants in CIT studies are asked to ‘place themselves in the moment when’ they were
performing a task or participating in an activity. Questions and probes identify factors which influenced task success or task failure. Analysis of reports from multiple participants yields rich data about the factors influencing success or failure in the activity. Early CIT studies gathered data through observation, but interviews and surveys are commonly used today. The CIT has been used widely in LIS research.\textsuperscript{20}

Flanagan recommended five stages of the CIT which I illustrate with examples from ULI studies.

\textbf{1 – Determine the general aim of the activity in question.} The purpose of the activity being explored should be obvious to the researcher and participants alike improving the authenticity of the results. A ULI study focuses on a student’s effort associated with a capstone project within his or her academic major. The purpose of this activity should be abundantly clear to students in ULI studies. Nonetheless, students are asked in the survey to recount the learning objectives and deliverables associated with the project as a check on this understanding.

\textbf{2 – Create plans for data gathering.} Planning the study, selecting the sample, and designing and testing the instrument are critical for establishing clear procedures to be followed during data collection and for keeping the scope of the study manageable. The ULI protocol uses a survey instrument delivered through Qualtrics that was developed through two rounds of interview-based research. Questions, probes, and response categories were derived from the qualitative studies and validated and supplemented with content and questions from related studies.\textsuperscript{21} The survey was constructed using the ‘tailored design method’\textsuperscript{22} and it has been evaluated and refined through a cognitive walkthrough, expert review, and pilot testing.

\textbf{3 – Carry out plans for data gathering.} The credibility of the findings can be improved if similar data gathering processes are used for all participants. And interviewers (if used) should be trained. The ULI protocol currently uses a web-based survey, limiting bias during data collection. Best practices for content analysis of learning outcomes and qualitative data gathered by the survey are also followed.
4 – Analysis – Typically CIT data are qualitative in nature and inductive methods are used to identify emergent themes, though the researcher is encouraged to use theoretical frameworks where possible. The ULI survey gathers both quantitative and qualitative data so multiple methods of analysis are used to understand students’ experiences. Theories and empirical findings from the literatures of college impact and information seeking and use (INSU) inform the construction of the instrument and the design of ULI studies.

5 – Reporting – Flanagan recommended researchers report limitations or possible biases in CIT study results so readers could generalize the results. The ULI protocol uses descriptive and inferential statistics and narrative to report findings. Demographic data and scales measuring academic challenge, library use, and non-traditional student status allow study sites to compare their samples with the population from which they are drawn. A ULI study is intended to discover evidence of library impact on locally defined learning outcomes within a specific setting. Therefore readers of ULI reports are encouraged to consider the transferability of ULI results but not to generalize beyond the study site.

Design

This IRB-approved dissertation study (UNC IRB # 10-1585) will be carried out during the fall of 2011 in partnership with libraries and history departments at four: a high research activity university (RU/H), a very high research university (RU/VH), a liberal arts college (Bac/A&S), and a master’s university (Master’s L).23 Approximately 200 students enrolled in capstone history courses during the fall of 2011 at the four sites make up the study population. Data collection will take place during summer and fall 2011. Analysis and reporting will be carried out during winter 2012.

Data gathering – learning objectives

Documentation of learning objectives associated with capstone coursework in history will be gathered from history departments and faculty during the summer and fall of 2011. This documentation will be used during analysis to link library use to frameworks for assessing student learning outcomes.
Data gathering – student survey

The survey instrument URL will be distributed to the students enrolled in capstone courses at the end of the fall semester 2011. The survey first asks the student to think back to the time when they were working on their capstone project and includes several questions and probes.

- In the first set of questions a student respondent provides details about learning expectations and deliverables associated with their project.
- Four blocks of partially-open questions ask the student about his or her use of 1) electronic resources, 2) traditional (non-electronic) resources, 3) library services, and 4) library facilities and equipment during the project. Subsequent probes in each block identify the ‘most important’ resource, service, or facility for the project, the learning activities it supported (e.g. choosing a topic, gathering evidence), how it helped, and problems the student had.
- Open-ended questions identify challenges the student experienced during the project and the gap defining and facing behaviors used to overcome those challenges. Another question using the contingent valuation method identifies the most important type of library use for the project, and what the student would have done had it not been available. The survey closes with questions about the student’s affective state, demographics, and academic experiences.

Analysis - Linking library use to student learning outcomes

As noted above, survey respondents identify the ‘learning activities’ during which they used their ‘most important’ resource, service, and facility. These learning activities (see figure 1) closely mirror stages of the Information Search Process (ISP) with some adaptations for a capstone undergraduate history project. An ‘activities crosswalk’ links learning activities with one or more institution-specific learning outcomes associated with the capstone project. Locally defined learning outcomes are also linked to elements of the VALUE rubrics defined by AAC&U and discipline-specific outcomes defined by the History Tuning process. The ‘activities crosswalk’ is created through content
analysis of 1) learning outcomes in syllabi and rubrics provided by each study site, 2) the VALUE rubrics, and 3) the Tuning outcomes for history. Multiple raters conduct this analysis for each mapping in the crosswalk and inter-rater reliability is computed using Krippendorff’s alpha reliability coefficient.\textsuperscript{25}

An example of this mapping would be: ‘A student uses primary sources’ (library use) when ‘gathering evidence for a thesis’ (activity) which helps students achieve the learning outcome ‘provides compelling evidence to support thesis’ (outcome). Further, the achievement of this outcome could be assessed with an element from the Critical Thinking VALUE Rubric: ‘Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis’ or a similar outcome from the Tuning framework. This mapping enables links between student reported use of the library and multiple frameworks for assessing student learning outcomes.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure1.png}
\caption{A crosswalk for linking library use to student learning outcomes frameworks}
\end{figure}

Analysis – understanding library impact and evaluating the instrument

The purpose of this study is to evaluate the ULI data gathering instruments and analysis tools and to provide study sites with actionable data to support decision making and advocacy. Survey response data are normalized and placed in a MySQL database and reports are provided to study sites via a secure website. Descriptive statistics regarding reported library use, ‘most important’ uses, and
helps and hindrances paint a picture of library support for student effort during capstone coursework. Other reports illustrate how the activities crosswalk links library use to student learning outcomes frameworks. Analysis of open-ended and partially open questions identifies new themes that can be used to improve future iterations of the instrument and improve its content validity. Answers to open ended questions are also shared with study sites. Three scales are created: academic challenge as measured by a battery of questions borrowed from the National Survey of Student Experiences (NSSE), library use data from the College Student Experiences Questionnaire (CSEQ), and a nontraditional student scale borrowed from National Center for Educational Statistics (NCES).26 Chi-square tests check for correlations between the scale scores and use types, helps/hindrances, confidence/anxiety, and other themes expressed as nominal data in the study to support further analysis.

Four methods are used to test the reliability and validity of the findings. A saturation or exhaustiveness check will determine the point at which new content categories “stop emerging” for the following data elements: types of library use (resources, services, and facilities), helps and hindrances observed, activity types, challenges, and affective responses. The strength of themes emerging in the survey is established by assessing the proportion of incidents in which a theme appears. Inter-rater reliability checks will be used in content analysis of the open-ended responses in the survey and in content analysis tasks used to construct the ‘activities crosswalk’. Finally, participant cross-checking will be carried out with a subset of the student sample.27

ULI results are delivered to study sites through a secure database-driven website where librarians and faculty can explore descriptive statistics, correlations within the data, and qualitative feedback from students. Librarians and faculty can also examine linkages between students’ information use behaviors and frameworks for assessing and communicating student learning outcomes. The ULI database tracks results from multiple study sites and multiple cohorts over time and will eventually serve as a repository of evidence of students’ information use.
Implications, significance, and next steps

The Understanding Library Impacts protocol makes a unique contribution to librarianship at a time when the field needs methods for demonstrating value. Instead of promoting library-centric metrics, the protocol connects library use to student learning outcomes defined by teaching faculty and of relevance to students and stakeholders. The protocol goes beyond use measures to demonstrate how library and information services helped (or hindered) student achievement. This evidence can be used to support internal improvement efforts or reallocation of resources. Qualitative data gathered in ULI studies can inform other measures, reveal new themes, and elicit rich user stories of library impact to support library advocacy efforts. The use of externally valid scales (e.g. NSSE, CSEQ) and links to the VALUE rubrics and Tuning framework for student learning outcomes increase the credibility of ULI results in the wider higher education community. The ULI protocol features a flexible design that can be adapted for use in multiple disciplines (e.g. social sciences, science, humanities) and in a variety of post-secondary settings. Next steps include adapting the protocol for use with another discipline and exploring integration opportunities with assessment management systems. Libraries that adopt the ULI protocol should be in a strong position to join campus conversations about student learning and to advocate for resources.

The protocol contributes to the body of user-oriented INSU research as well. The ULI protocol features an original design grounded in theories and methods from the literatures of college impact and INSU. The protocol uses the critical incident technique (CIT) for exploring the value and impact of information services adding to the strong and growing literature using this research method. The ULI contributes to the INSU tradition through its use of both quantitative and qualitative methods and the use of multiple methods for testing the reliability and validity of study results. Finally, study results will accumulate over time in the ULI database, creating a rich repository for studying the impact of library and information services.
References

4. Ibid, p. 5
6. Ibid, p. 3.
23. Carnegie classification descriptions for study sites can be found at http://classifications.carnegiefoundation.org/descriptions/.

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