

Title: Ethnography as an Assessment Tool, The ERIAL Project

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Abstract:

The Ethnographic Research in Illinois Academic Libraries project was a two-year research study, funded by a Library Services and Technology Act grant through the Illinois State Library, which ethnographically examined how undergraduate students at five universities [Illinois Wesleyan University, University of Illinois Springfield, University of Illinois Chicago, Northeastern Illinois University, DePaul University] conduct academic research and utilize library services. The project was organized around three core goals: to gain a better understanding of undergraduates' research processes based on firsthand accounts of how they obtain, evaluate, and manage information for their assignments, to assess the role academic libraries and librarians play in these research processes, and finally, to adjust library services to more effectively address students' needs. Because of the complex processes involved in information literacy acquisition, and the diverse array of problems this study has observed in students' research practices, the problem of how to best measure the impact of library instruction continues to be a central issue. As an assessment tool at IWU, a general information literacy test appears to be effective for providing baseline data of students' knowledge, but ineffective for evaluating post-instruction improvements or for providing insight into students' application of this knowledge. By contrast, the qualitative interviews provided a rich data source for holistically understanding students' research processes and practices, as well as a fine-grained tool for analyzing the obstacles students encounter when conducting research. Findings from the ERIAL Project, as well as an outline of IWU's current efforts to develop and implement a standardized qualitative interviewing method that can be used to make longitudinal comparisons of student's information literacy skills in conjunction with a general information literacy test, will be discussed.

Introduction

The Ethnographic Research in Illinois Academic Libraries (ERIAL) Project was a two-year research study, funded by a Library Services and Technology Act grant through the Illinois State Library, which ethnographically examined how undergraduate students at five universities¹ conduct academic research and utilize library services. The project was organized around three core goals: to gain a better understanding of undergraduates' research processes based on firsthand accounts of how they obtain, evaluate, and manage information for their assignments, to assess the role academic libraries and librarians play in these research processes, and finally, to adjust library services to more effectively address students' needs. Using a variety of anthropological data collection techniques², this study built a holistic and user-centered portrait of student needs through an examination of what students actually do while completing their research assignments.

At Illinois Wesleyan University (IWU), the results of the ERIAL study have provided an especially rich data source for understanding how students approach academic research and use the library's resources, as well as the types of obstacles they encounter along the way. In all, nine methodologies were employed, resulting in 221 individual research contacts and the administration of 272 information literacy pre and post tests.³ This paper will focus on IWU's use of three methods as tools in assessing information literacy for first year students: ethnographic interviews with students, research process interviews, and a paper-based information literacy pre and post test. Findings from the ERIAL Project, as well as an outline of IWU's current efforts to develop and implement a standardized qualitative interviewing method that can be used to make longitudinal comparisons of student's information literacy skills in conjunction with a general information literacy test, will be discussed.

Institution Information

Founded in 1850, IWU is a highly selective, private, residential, undergraduate liberal arts school of 2,100 students, offering a diverse curriculum in liberal arts, fine arts, and professional programs, as well as opportunities for interdisciplinary study and study abroad. A liberal arts education at Illinois Wesleyan is designed to foster creativity, critical thinking, effective communication, strength of character, a spirit of inquiry, and a comprehensive worldview.

Of the five institutions involved in the ERIAL Project, IWU enjoys the highest ACT scores, as well as retention and graduation rates (90% for first year students and 83%, respectively).⁴ It is the smallest in size, has no graduate students, the fewest transfer students, and highest proportion of international students; however, IWU is the least diverse in terms of minority students. In the academic year 2009-2010, 59% of IWU students were female and 41% male, with 6% international, 76% white and 24% ALANA.⁵

IWU requires all students to enroll in a writing course during their first year on campus, with the majority doing so in the fall semester. This "Gateway" course is a small, discussion-oriented class designed to develop students' critical thinking and writing skills. Although not required, many Gateway instructors include library instruction sessions as part of their course content.

Library instruction sessions are also requested by instructors, in a variety of disciplines and for various courses, throughout a student's tenure at IWU. The Ames Library, as part of its increased information literacy efforts, would like for a library instruction component to become a mandatory part of all Gateways and for advanced instruction sessions to be strategically woven throughout various points in the undergraduate curriculum.

Methodology

The IWU information literacy test was based on a modified version of the Information Competency Exam developed by the Bay Area Community Colleges Information Competency Assessment Project.⁶ In order to fit the institutionally specific needs of the IWU study, the research team shortened the overall length of the test and made minor changes to the format and wording of some of the original test questions.⁷ IWU's 26-question tests were designed to be completed in approximately 20-25 minutes, and to measure students' information literacy levels in four of the five standards developed by the Association of College and Research Libraries.⁸ In addition to the tests, the students were also asked to complete a short demographic survey.

The pre-test was administered during the first two weeks of the fall 2009 semester, while the post-test was administered during the final two weeks. The participation of Gateway courses in the information literacy study was at the discretion of the individual course instructor. Participation by the students was also voluntary. In total, 21 classes participated in the pre- and post-tests, representing roughly 2/3 of the 32 Gateway courses offered during the fall 2009 semester. Of these, 15 classes participated in library information sessions. 273 students participated in the pre-test, and 272 in the post-test, representing approximately 53% of IWU's 2009-2010 freshman enrollment.

In order to more fully contextualize the quantitative component of this study, the Gateway students who participated in the information literacy tests were also asked to participate in qualitative interviews. During the "research process interviews," students demonstrated how they gathered information for a research assignment while accompanied by the study's ethnographer, who asked the student to explain aloud their search process and documented the search on video. 19 first year students participated in the research process interviews, with each interview lasting approximately 30-45 minutes. These interviews built on ethnographic interviews conducted during the 2008-2009 academic year, which focused on the processes and practices of students' research. 30 students participated in these interviews, including 8 first year students.

Summary of Findings for First Year Students

The mean score on the information literacy pre-test was 17.64 (67.8%), compared to 18.36 (70.6%) on the post-test. While this improvement is statistically significant (at $p < .05$), its effect size is also extremely small ($\eta^2 = .014$), suggesting that there is no meaningful difference between the average scores on the two tests. Furthermore, the test results showed no

significant variation by gender, ethnicity, major, or the number of library information sessions the student attended during the semester.

Despite the clear difficulties with basic information literacy that these scores suggest, for the most part, students believed their skills were slightly above average. When asked to rate their own skill in locating and evaluating information on a scale from 0-10,⁹ the majority of students rated themselves between 6 and 8 in both categories on both tests.¹⁰ Students were especially confident in their abilities to locate information on the post-test, with 81% rating themselves at 6 or better. These self-ratings were not, however, correlated with students' scores on either test.

While students' overall performance on the information literacy tests was for the most part lackluster, students consistently performed more poorly on questions addressing ACRL Standards 2 and 5, which evaluate, respectively, students' ability to appropriately and effectively access information, and students' understanding of the legal and ethical issues of information use.

ACRL Standard	Pre-Test		Post-Test	
	Mean Score	Percent Correct	Mean Score	Percent Correct
1. Determining Need	4.5/6	75.7%	4.7/6	78.8%
2. Accessing Information	5.3/9	59.2%	5.6/9	61.7%
3. Evaluating Sources	3.9/5	78.9%	4.1/5	82.1%
5. Ethical use of Information	3.8/6	63.7%	4.0/6	66.0%

Taken together, these results imply two possible conclusions: either the student's information literacy skills did not significantly improve over the course of their first college semester, or the information literacy tests (and in particular the post-test) did not effectively measure improvements in students' learning outcomes. For example, when assessing Standard 2 (accessing information), it appears that written tests are an inadequate method for understanding students' abilities to search for and find sources, and revealed only a small part of students' widespread misunderstanding of how databases work and are effectively queried.

Likewise, although students performed reasonably well on Standard 3 (evaluating sources), and rated themselves highly in this area, after viewing the recordings of students' research process interviews (discussed below), it was starkly apparent that they were not actually utilizing proper evaluation techniques in practice.

In the case of Standard 5 (ethical use of information), IWU librarians have limited time with students (typically only one class session, and occasionally two or three), necessitating an assignment-based focus in the sessions which often does not include specifically addressing copyright and ethical issues.

A question by question analysis of students' responses suggests several patterns in students' information literacy deficiencies:

- Students are unable to correctly read citations and identify the type of source referenced. Furthermore, students do not exhibit an adequate understanding of why it is important to cite information, or when a citation is required. Of the four questions in the information literacy tests that asked students to indicate the type of source (journal article, book, or book chapter) described by a given citation, 42% of students answered 0 or 1 question correctly on the pre-test, compared to 37% on the post-test. Only 9.5% of students answered all four questions correctly on the pre-test and only 14.5% on the post-test.
- Students do not fully understand issues surrounding the ethical use of information, especially with respect to the meaning and implications of copyright protection, and the practical actions required to correctly comply with copyright law.
- Students exhibit difficulty in evaluating sources of information, and are particularly confused about the differences between primary and secondary sources.
- Students do not adequately understand how information resources are organized, both in the library and elsewhere (e.g. on the Internet). For example, students exhibit difficulties understanding the difference between the library's catalog and on-line databases, the types of resources that can be found using these tools, and the differences between library subject-specific databases.

During the 19 research process interviews conducted with first year students for this study, the research team observed 70 unique searches.¹¹ 60 of these searches were for unknown items (e.g. when a student was attempting to discover sources related to a research question, rather than a specific book title or journal article).

These interviews provided a much more nuanced insight into students' research processes and information literacy levels. After reviewing and coding the videos of the research process interviews, only 3 out of 19 students conducted what a librarian might consider a reasonably well-executed search. 48 specific problems were identified, which can be grouped into the following six areas:

- **Selection of database:** Using an inappropriate or less useful database was common. Of the 19 interviews, 8 students searched in databases that a librarian would most likely never recommend for their topic. In addition, students who did not have a library

instruction session exhibited substantial difficulty finding their way to any library database, let alone the best one for a topic. For example, one student tried the following areas on the library's website while looking for a journal article: ILLiad (used to request journal articles not owned by IWU), Digital Commons (institutional repository), Citation Linker (used to locate journal titles owned by the library), I-Share catalog (used to request books from other Illinois libraries) and Google, where she finally gave up without locating an article.

- **Search strategy:** Students treated all search boxes as the equivalent of a Google search box. Of the 19 students, 16 conducted searches using “any word anywhere”, “all fields,” or an equivalent default search when it was not appropriate to do so. In total, 101 of the 117 observed sets of search terms used this approach.
- **Citations:** An inability to accurately read citations lead to difficulty finding a specific source and/or selecting appropriate sources.
- **Evaluation:** Evaluation of potential sources appeared cursory. Students typically made rapid appraisals of a source's usefulness, often based only on its title or a superficial scan of its abstract. Only rarely did a student actually look at the subject headings or keywords associated with the document, read the text itself, or locate the book to review the table of contents. Students also did not review citations past the first or second page of their results.
- **Locating physical items:** Students often had difficulty locating books in the library stacks. When students sought help for locating a book at one of the three service points (all of which are staffed by student assistants) they were sometimes given incomplete or incorrect information.
- **Technical:** Students encountered a variety of technical issues (e.g. dead links in the databases, slow databases, and incomplete information in an ILLiad request form) during their searches. This often resulted in the student abandoning the source in question and beginning a search for different items. In general, students were very quick to give up on finding a source, so much so, that almost any obstacle they encountered would cause them to move on to another source or to change their research topic.

Further observations include:

- Although the majority of the students struggled with finding the correct database to use, their search terms, locating a known item, and/or technical problems, not one student sought the assistance of a librarian. However, students did ask for help at one of the three service points (all of which are staffed by student assistants) when they encountered difficulty finding a book in the stacks or a jammed printer.

- In general, students appeared to have a very strong preference for selecting sources that are available online in full-text. This often led to a student ignoring a potentially appropriate source, simply because it was not readily available.
- Conducting a successful search for scholarly sources is a complex process that requires numerous steps and considerable knowledge of the discipline and its particular jargon. Moreover, it is critical for students to understand how information is organized, how to evaluate sources, and how to use the “tools” of scholarship – online catalogs, databases, the Library of Congress Subject Headings, etc. If a student lacks sufficient knowledge in any one of these steps, the quality of their search results, and subsequently the sources on which they base their research, can be significantly diminished. For example, one student, while searching library databases for information about women in baseball, lamented the dearth of information on this topic and was seriously considering changing topics – all while her mouse was hovering over the subject heading “All-American girls professional baseball league”.
- Almost without exception, students exhibited a lack of understanding of search logic, how to build a search to narrow/expand results, how to use subject headings, and how various search engines (including Google) organize and display results. As one student mentioned, while conducting a search of library databases “Apparently you don’t have much on Rock and Roll”, obviously not realizing if she changed her search term (i.e. to rock music), she would have encountered excellent sources for her assignment.
- Students exhibited a lack of understanding of where the border is located between library resources and Internet resources. For example, when a student is instructed by a professor to find “non-Internet sources,” they are often unsure if the library databases, which are accessed via the internet, constitute appropriate sources. Likewise, if a student accesses library resources via Google Scholar, they are often unaware that these are, in fact, frequently made available through the library.
- Students who had participated in instruction sessions clearly knew more than those who had not done so. These students were better at locating databases, changing keywords, and using more of the library’s tools. As one student noted, the librarian “...gives us the most effective sources to use.” However, they often did not remember some basic or specific concepts, or apply them correctly.
- Students gave up on a search or changed a topic very easily. They also often searched to meet minimum expectations (e.g. three articles), not necessarily to find the most useful sources.

Based on the ERIAL study experience, we conclude that it is exceedingly difficult (if not impossible) to create a stand-alone quantitative assessment tool that can accurately measure students’ learning outcomes over the course of a semester. Furthermore, these types of tests

reveal relatively little about students' ability to apply information literacy concepts within the vagaries of real-world settings and assignments, skills they may not have even if they are able to select the best response on a multiple choice question. In fact, had scores on the post-test improved significantly (and had we not already planned to conduct qualitative assessment), the test results might have actually obscured our students' very real problems. In all of these cases, the information literacy test results told only a fraction of the story, while the ethnographic interview results provided a much richer understanding of our students' information literacy in practice.

Ongoing Assessment

IWU's experience has led us to question the efficacy of a pre-test/post-test model of assessment, especially when used within the relatively short timeframe of a single semester. Instead, we propose a long-term commitment to a longitudinal mixed-methods approach that more adequately examines the complex processes involved in information literacy acquisition and the diverse array of deficiencies this study has observed in IWU students' research practices. The success of our initial study in uncovering the realities of student research has led us to develop an assessment model that uses the strengths of various techniques in unison to more completely explore information literacy acquisition and use of these skills.

At IWU, a general information literacy test appears to be most effective for providing baseline data of students' knowledge, but not effective for evaluating post-instruction improvements or for providing insight into students' application of this knowledge. Nevertheless, a general information literacy test does have the advantage of a large sample size that is statistically generalizable to a full cohort of students. An information literacy test also efficiently reveals broad deficiencies in students' knowledge base, thereby pointing out areas in need of additional study. For example, the information literacy test at IWU pointed out a systematic problem with correctly reading citations, an observation that helped explain the numerous failed known-item searches we observed during the research process interviews.

Ethnographic techniques, like those described above, are especially useful for understanding why and how quantitative results occur, and the qualitative interviews conducted at IWU provided a rich data source for holistically understanding students' research processes and practices, as well as a fine-grained tool for analyzing the obstacles students encountered when conducting research. In short, these interviews vividly demonstrated what students are actually doing on real assignments in real time, as well as how students choose to handle various impediments along the way. A startling observation was the lack of understanding that students exhibited regarding how a librarian might assist them with their research. Based on both the observation and interview sessions with participants, it is clear that IWU students do not have an accurate perception of librarian's work, particularly with regards to how they might benefit from working with one. This specific observation, and how it plays itself out on a daily basis as students use library resources and services, would have been difficult to ascertain from the information literacy pre and post tests alone. Thus, the simultaneous use of both

qualitative and quantitative methods can be a powerful and mutually supportive approach to examining information literacy.

While we believe the study described here provides an effective model for an initial information literacy study, and provided much needed empirical data, a critical component of information literacy assessment is also understanding how students' knowledge and skills develop over time, a question that requires a longitudinal approach to data collection. The library faculty at IWU are now fully committed to establishing a continuous data collection strategy, as follows:

Information Literacy Test	Research Process Interviews	Retrospective Interviews
A representative sample of First Year Students	Sophomores and Juniors	Seniors
A representative sample of Juniors	Alternating on a 2-year cycle with retrospective interviews: 10 in year 1, 5 in year 2.	Alternating on a 2-year cycle with research process interviews: 5 in year 1, 10 in year 2.

This data collection strategy concentrates on collecting the most pertinent information from each group: baseline data for first and third year students, data on processes and practices for second and third year students, and interviews about an entire research project from seniors completing major papers. Over several years, this relatively modest level of ongoing data collection (only 15 interviews per year, plus the information literacy test) will build a significant longitudinal data set with multiple contacts within each cohort to make comparisons. Ideally, some of the same students would also participate in multiple interviews. IWU is currently developing a standardized interview protocol to further ensure that qualitative research results remain comparable over time.

Conclusions

Obtaining empirical evidence describing the research habits of IWU students has served a dual purpose. With an increased understanding of user needs, IWU librarians have begun to develop more effective models of service, tools of scholarship, relationships with teaching faculty, and instructional techniques. Secondly, as a direct result of the ERIAL Project, as well as sustained efforts by all the librarians at IWU, the Associate Dean of Curriculum, Writing Coordinator for General Education and the Writing Program Director are now actively engaged in conversations with the library faculty to address these concerns through faculty education, as well as possible curricular changes.

Because of the complex processes involved in information literacy acquisition, as well as the diverse array of problems this study has observed in students' research practices, the problem of how to best incorporate the teaching of and measurement of information literacy skills and the impact of library instruction will continue to be a central issue for IWU. Our goal is to build on the substantial data gathered in the last two years and to create a sustainable program – a

key component in any assessment plan—long with “institutionalizing” the efforts to understand the needs of our users, teach information literacy, and assess our success.

¹ Illinois Wesleyan University, University of Illinois Springfield, University of Illinois Chicago, Northeastern Illinois University, and DePaul University. For additional information on the ERIAL projects see <http://www.erialproject.org>.

² Techniques included videotaped interviews with librarians, faculty and students and search sessions with students, cognitive mapping, photo journals, mapping diaries, web design workshops, retrospective interviews, research journals, and information literacy pre/post testing.

³ The authors would like to acknowledge the members of the IWU Research Team and their contributions to this project: Monica Moore, Sue Stroyan, and Suzanne Wilson.

⁴ National Center for Education Statistics--College Navigator (<http://nces.ed.gov>); for academic year 2009-2010.

⁵ African, Latino/a, Asian, and Native American.

⁶ See <http://www.topsy.org>.

⁷ A copy of the IWU test instrument and documentation of the test results is available at <http://www.erialproject.org/publications/presentations/>.

⁸ See <http://www.ala.org/ala/mgrps/divs/acrl/standards/informationliteracycompetency.cfm#stan>. The five standards are as follows: The information literate student (1) determines the nature and extent of the information needed; (2) accesses needed information effectively and efficiently; (3) evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system; (4) uses information effectively to accomplish a specific purpose; and (5) understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally. Standard 4 was not tested, as it was deemed outside of the scope of this study.

⁹ The questions were presented as follows:

On a scale of 0 to 10, with zero being poor and ten being excellent, how would you rate your library research skills in terms of being able to locate information? Circle your response:

0 1 2 3 4 5 6 7 8 9 10

On a scale of 0 to 10, with zero being poor and ten being excellent, how would you rate your library research skills in terms of being able to evaluate information? Circle your response:

0 1 2 3 4 5 6 7 8 9 10

¹⁰ On the pretest, 65% rated themselves between 6 and 8 in their ability to locate information, while 64.5% rated themselves between 6 and 8 in their ability to evaluate information. On the post-test, these percentages increased to 73.3% and 68.8% respectively.

¹¹ For the purposes of our analysis, we defined a search as anytime a student opened a new resource to search for information. If the student changed their search terms within a resource, we did not count this as a new search. Therefore, we observed 70 searches encompassing 117 separate sets of search terms.