The University of Tennessee

Science Journals and Science Students: Bringing Them Together

Dr. Carol Tenopir
University of Tennessee
ctenopir@utk.edu

National Science Digital Library

Science, Mathematics, Engineering and Technology Education Program

Services Track

2001-2003

www.nsdl.org

Web.utk.edu/~tenopir/nsf

General Questions

- How can undergraduate students be encouraged to recognize and use high quality science journal literature?
- What features in a journal literature digital collection are most useful and encourage use?

Phase 1: Focus Groups and Surveys
Chemistry,Physics, Engineering

- Undergraduates
- Graduates (Graduate Teaching Assistants)
- Faculty
- ORNL Scientists
- 7 Focus groups, ~60 participants

Phase I Analysis Identified:

1 Variations by grade level

2 Variations by subject discipline

3 Access means for articles/search strategies

4 Variations in type of literature required and faculty recommendations

5 Problems with journals and access

6 Purposes for using journal articles

Phase I Analysis: Variations by Grade Level

- Undergraduate students have little knowledge of scholarly journals and little time for journal literature
- Graduate students were introduced to journal literature when they declared a major or begin work on a thesis
- Faculty believe an introduction to scholarly literature is necessary for freshmen

Variations By Grade Level

- “Students should be exposed to the literature at the junior or senior level. Freshmen don’t care. They faint easily.”

- “Require freshmen to read journal articles? I’m just glad they read the textbook”.

Phase 1: Variations by Subject

- Chemists feel journal literature is important and introduce it earlier and systematically to students.
- In Physics and Astronomy undergraduate students have limited exposure to journals; however, some knowledge of online sources is required.
- Engineering students become acquainted with journals at different times, in different classes, for different reasons.

Variations By Subject Discipline

- “Engineers read each article and spend a lot of time on each.”
- “Chemistry has a long tradition … they have a corpus of textbooks and literature specialists.”

Phase 1: Access Means & Search Strategies

- Professors give articles to students to read
- Students are asked to search and find relevant literature
- The Internet is the tool of choice
- Full-text databases are the most frequently used sources; 5 times per week on average
- Students scan titles to locate topics of interest

Access Means For Articles and Search Strategies

- “Students want what they can print out. Immediate gratification. They need it now. Quick and easy. They don’t recognize the fact it isn’t in English.”

- “If something is from .edu it has credibility.”

- “I did a web tutorial a year ago but don’t remember any of it.”

Phase 1: Variations in Type of Literature Required & Faculty Recommendations

- Undergraduates: textbooks, lab journals, magazines and interpretations
- Graduates: general information from magazines and journals
- Faculty recommendations include student awareness of society publications and journals

Variations In Type Of Literature Required And Faculty Recommendations

- “Contrived searches are the worse. One professor would assign 10 articles to be defined on a nonsense topic. What made him stop? He retired.”
- “Start with an encyclopedia … move to a treatise … monograph … articles … etc. Make a process”.
- “Information literacy should be built into and reinforced in every course.”

Phase 1: Problems with Journals & Access

- Faculty sees problems with knowledge of searching and techniques
- Time is an obstacle; students work on a last-minute basis looking for instant gratification
- Students have difficulty perceiving reliable information on the web

Problems With Journals And Access

- "If I can't find it in 30 seconds, it's not worth finding.“
- "The professor gave us an article that no one in the group, including the professor, could understand.“
- “It’s very important for an article to be edited.”

Phase 1: Purposes for Using Journal Articles

- Specific assignments
- Papers
- Projects
- Practice search exercises

Purposes For Using Journal Articles

- "Students are graded on weight and sweat.“
- “Professors give websites for data…not journal articles, but data.”
- “A small paper, a small project.”

Phase II: Testing

- March – July 2003
- Testing specified desired features
- Testbeds: 1) a full text subset of OSTI's Energy Citations Database; 2) ScienceDirect

Experimental design

- Participants
  - Participants from Phase I
  - New participants with similar backgrounds
- Simulated class-related tasks
  - Faculty: conducting a search for literature to design a course assignment
  - Students: conducting a search for literature to complete a course assignment

Data Collection

- Behavior
  - Search process (video)
  - Think-aloud during searching (audio synchronized with video)
  - Topic description before searching
  - Topic description after searching
  - Post search input
- Cognitive trait
  - Learning style

Some Tentative Conclusions from Phase 2

- Most students use feature labeled "easy search" or "quick search"
- One male engineering student used browsing by subject clusters of journals (even though he didn't recognize specific titles)
- No students used help files or search tips (faculty did)
- Few use field limitation or advanced features

Overall Conclusions: Students

- are comfortable with the web
- have ways to evaluate web content
- value quick and easy
- need incremental help understanding journals and systems