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## Bringing Library Instruction to Engineering Students: Comparing Three Approaches

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# **Bringing Library Instruction to Engineering Students: Comparing Three Approaches**

by Susan Boyd  
Michel Orradre Library  
Santa Clara University

**ELD/ASEE Annual Conference and Exposition  
Salt Lake City, Utah  
June 23, 2004**



# Santa Clara University

- Private institution founded by the Jesuit order of the Catholic Church in 1851.
- Total enrollment = 8,000 students (including 1,300 in the School of Engineering)
- Undergraduate degrees in the arts and sciences, business, and engineering.
- Graduate degrees in business, law, engineering, pastoral ministries, counseling psychology and education.



# School of Engineering

## Departments:

- Computer Engineering
- Electrical Engineering
- Mechanical Engineering
- Civil Engineering (undergraduate degrees only)
- Applied Mathematics (graduate degrees only)
- Engineering Management (graduate degrees only)



# The New Academic Instruction Adventure

- What's information literacy?
- Where to start
- Peer coaching; English 2 practice
- Faculty consultation
- LOEX, Immersion 2003
- Reflection, modifications
- Future planning



# Bringing Library Instruction to Engineering Students: Comparing Three Approaches

- Approach #1: In-class instruction within the Engineering department
- Approach #2: In-class instruction in required technical writing course within the English department
- Approach #3: Outside of class instruction covering engineering resources



# **Approach #1- In-Class Instruction - Advantages**

- Timing of instruction is “just-in-time” before assignment involving library research.
- Answers students’ question: “Why do I have to learn this?”
- Instructor presence increases students’ attention and focus.
- Instructor adds value to the class by contributing insights and/or comments.
- Class relevance optimized by collaboration between faculty and librarian.



# **Approach #1- In-Class Instruction - Disadvantages**

- Time to meet with instructor
- Time to develop materials which maybe used only once
- The “invisible” instructor
- The “too visible” instructor
- The “changing” instructor
- Instructor requirements vs. your requirements
- Some content overlaps with outside of class instruction offered to all engineering students





# **Approach #1 - In-Class Lesson Example - Wireless Communications**

- Differences between the library's databases vs. the web; electronic vs. paper publications, and website evaluation
- Remote access to the library's website
- Search examples: library's catalog, ACM Digital Library, IEEE Xplore, and Compendex/Inspec
- Quiz: Finding a full text article and conference paper, finding more information on a standard and locating a patent--all relating to wireless communications



# **Approach #2 - In-Class Instruction Through Tech Writing Requirement - Advantages**

- In theory, reaching all electrical and computer engineering students
- More writing assignments to choose from for lesson planning
- Interdisciplinary subjects
- More emphasis on critical thinking in tech writing assignments



## **Approach #2 - Instruction Through Tech Writing Requirements - Disadvantages**

- Not reaching Mechanical and Civil Engineering Departments (Their tech writing requirement is covered in a departmental class)
- Some content overlaps with outside of class instruction offered to all engineering students
- One instructor of three tech writing classes opted out of library instruction session



## **Approach #2 – Website Evaluation Exercise**

Case study: Space shuttle Columbia disaster

Covering the different perspectives regarding engineering ethical issues

- Columbia Accident Board: <http://www.caib.us/>
- World Socialist Web Site:  
<http://www.wsws.org/articles/2003/sep2003/col3-s22.shtml>
- Edward Tufte: Ask E.T. Forum  
<http://www.edwardtufte.com/bboard/>



CAIB - Microsoft Internet Explorer

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## COLUMBIA ACCIDENT INVESTIGATION BOARD

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On Feb. 1, 2003, Shuttle Columbia was lost during its return to Earth. Investigators have found the cause.



**Recently Released**

October 28, 2003: [Columbia Accident Investigation Board Releases Vols. II-VI of Final Report](#)

The Columbia Accident Investigation Board today released Vols. II-VI of the CAIB's Final Report. These volumes contain appendices that provide the supporting documentation for the main text of the Final Report contained in Vol. I. [More](#)

**Events**

[Press Briefing](#)

Tuesday, August 26  
11:00 a.m. EDT  
National Transportation Safety Board  
Conference Center  
429 L'Enfant Plaza, SW

Internet



The Columbia Space Shuttle disaster: science and the profit system Part 3--Political and econom - Microsoft Internet Explorer

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Address <http://www.wsws.org/articles/2003/sep2003/col3-s22.shtml> Go Links Norton AntiVirus

**wsws.org**

# World Socialist Web Site

Published by the International Committee of the Fourth International (ICFI)

[WSWS](#) : [News & Analysis](#) : [Science & Technology](#)

## The *Columbia* Space Shuttle disaster: science and the profit system

### Part 3—Political and economic causes underlying the accident

By Joseph Kay  
22 September 2003

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*On February 1, 2003, the Space Shuttle Columbia was destroyed upon reentry into the earth's atmosphere, killing all seven crew members. Shortly after the incident, the Columbia Accident Investigation Board (CAIB) was set up to investigate the causes of the disaster. The board summarized its findings in a report released on August 26. This series of three articles analyzes the report and*

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**Question**

*The Columbia Evidence*  
For the story of how a Texas cardiologist/amateur photographer/space enthusiast used a 6-megapixel digital camera to photograph the break-up of the space shuttle, see [http://www.poynter.org/content/content\\_view.asp?id=19484](http://www.poynter.org/content/content_view.asp?id=19484)

Again illustrating that 80% of success is just showing up.

-- Edward Tufte, February 5, 2003

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**Answer**

*Columbia information sources*  
For detailed reports and primary data sources on the Columbia, go to <http://www.spaceref.com/Columbia/>

Also very useful: <http://www.nasawatch.com/>

-- Edward Tufte, February 5, 2003

Done Internet



## **Approach #2 - Technical Writing Class – Other Sections of Lesson Plan**

- Boolean searching
- Looking for interdisciplinary information - engineering, business, ethics
- Differences between web sources and the library's databases
- Databases covered: Library's catalog, Academic Search Elite, Social Sciences Full Text, Business Reference Suite, Business Source Elite, Factiva, Applied Science Index, General Science Full text and Philosopher's Index





# **Approach #3 - Outside of Class Engineering Resources Instruction - Advantages**

- Requested by faculty
- Does not take any of instructor's in-class time
- Any engineering student may attend
- Attendees are more motivated and interested even though no instructor is present
- Held at convenient times for students (includes evening class)
- Some instructors required students to attend, and asked for proof of attendance



# **Approach #3 - Outside of Class Engineering Resources Instruction - Disadvantages**

- No collaboration between instructor and librarian
- No applicable assignments
- Some overlap with materials used for in-class instruction
- More classes added to accommodate students' schedules (more of librarian's time)
- Majority of instructors do not require it
- Attendance drops after fall quarter



# **Approach #3 - Outside of Class Instruction**

## **“Becoming the Information Savvy Engineer”**

- Ask students what their engineering majors are- tailor the examples to their interests
- Emphasize the benefits of information from the library vs. information from the web
- Boolean searching
- “Tour” and examples of how to search engineering databases
- Quiz: Finding a full text article and conference paper, finding more information on a standard, locating a patent



# **Approach #3 - Outside of Class Engineering Resources Instruction - Promotional Opportunities**

- Grad school orientation - once/quarter
- Graduate students' information packets
- Computer engineering “events section” on departmental website
- E-mail distribution
- Annual engineering faculty/staff offsite meeting



**Direct your search for information, do research for today's technology! Find what you need to write papers, project reports and theses!**

**"Becoming the Information Savvy Engineer"**

**Presented by Susan Boyd, Engineering Librarian**

**Covers: An overview of library services, searching the library's engineering databases, and resources on how to cite your research in papers, project reports and theses.**





# **Bibliography from an Actual Senior Design Project: Before Library Instruction**

- <http://web.mit.edu/network/pgp/html> - MIT PGP distribution
- <http://windowware.com>- Winbatch Applications
- <http://www.eudora.com> - Qualcomm's Eudora Pro 3.0 E-mail interface
- PGP: Pretty Good Privacy - Simson Garfinkel (Jan. '95)



# Revised Bibliography After Library Instruction

Corrected Citations from the Previous Slide  
(APA format):

- MIT. (year). Distribution Center for PGP. Retrieved Date from: <http://web.mit.edu/network/pgp.html>
- Wilson Windowware Inc. (year). WinBatch, the Batch Language for Windows. Retrieved Date from: <http://windowware.com>
- Qualcomm (year). Eudora 6.0 E-mail interface. Retrieved Date from: <http://www.eudora.com>
- Garfinkel, S. (1995). PGP: Pretty Good Privacy. Sebastopol, CA: O'Reilly & Associates.



# Useful Techniques Common to All Approaches

- Active learning
- Vary techniques (visual, auditory, kinesthetic) to appeal to different learning styles
- Challenging exercises - recommend not doing them at the end of the class
- Real-life experiences
- Prompt feedback





# Accomplishments

- Revived library instruction program for the School of Engineering that had been on hold for almost two years
- Reached classes that had never had library instruction before
- “Thank You” from students
- Students returning for one-on-one assistance



# Conclusions

Ideally information literacy should be integrated with the curriculum

Faculty need to know what information literacy is, and how they can incorporate it into their classes

In the meantime, take advantage of all opportunities to reach engineering students

- In-class instruction tailored to engineering class assignments
- In-class instruction in other departments required for engineering students
- Outside of class instruction open to all engineering students



# Possible Future Approaches

- Classes given by library resource such as for a specific database or databases
- Speaking at student professional groups
- Classes for faculty