

# Using Patents Databases to Teach Information Finding Skills to Engineering Undergraduates

ASEE 2007

ELD Engaging Users of Course Management Systems, Blogs, Open Source, and a Database as Tools of Library Instruction



BROWN



Lee A. Pedersen  
Sarah Bordac  
Janet Blume

# Brown University Snapshot - 2006

- University: 6010 Undergrads
  - ~1500 total graduating seniors (281 Sc.B.)
- Division of Engineering
  - 71 Sc.B./2 A.B.
  - 37 Faculty
  - Common core: first 2 years
  - Specialize: second 2 years

## Accredited ScB Degrees

Mechanical



Civil



Electrical



Biomedical



Computer



Chemical Engineering



Materials Science



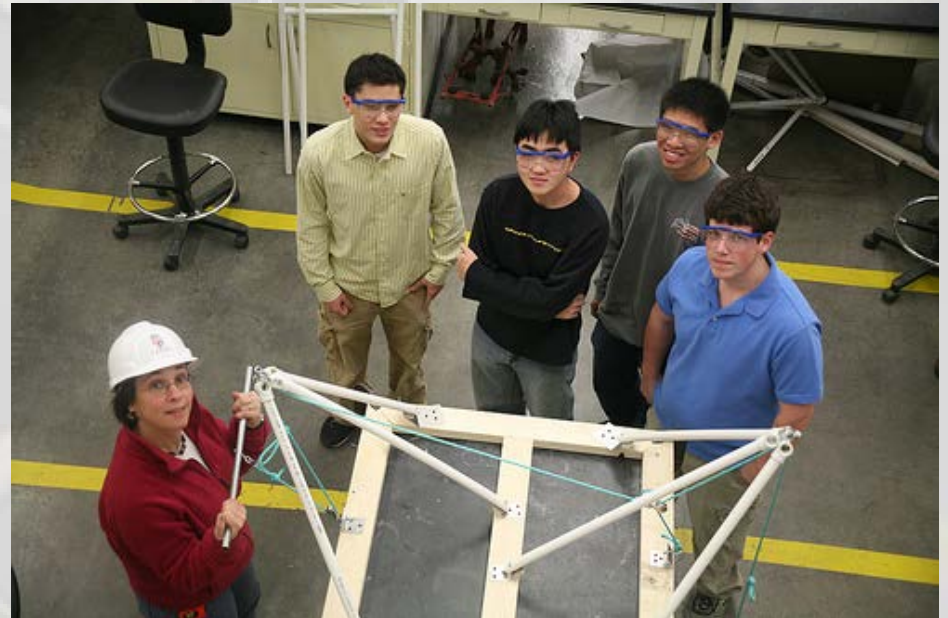
# Challenges to Library Instruction

- Open Curriculum effect – No requirements except for majors
- Invitation only
- Catch as catch can



# EN3 Introduction to Engineering

- First course for engineering majors
- Broad introduction and a foundation
- Pass/no credit grading
- 2 design projects in teams

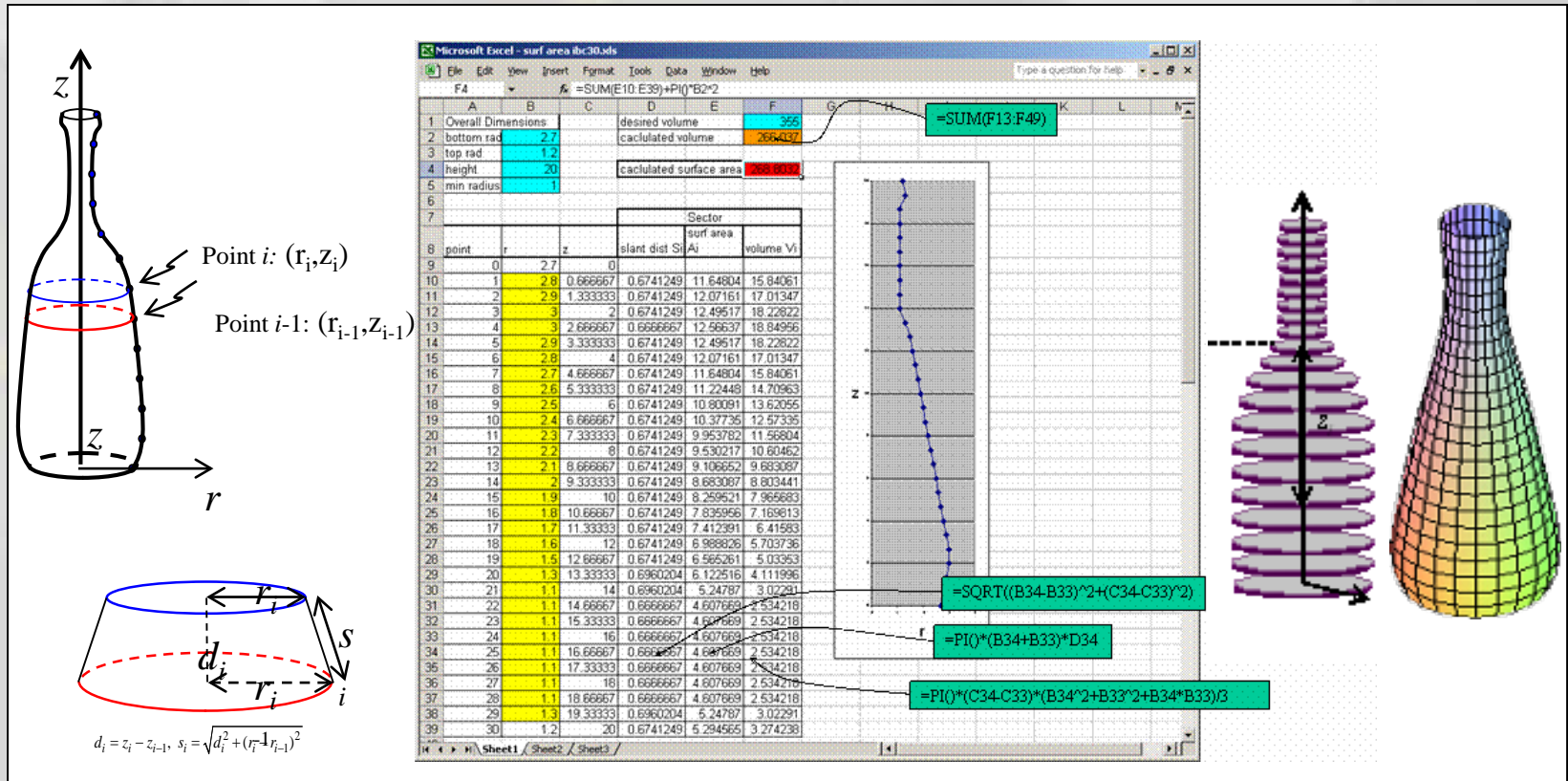


# 2005

- Meet before lat pull-down machine design
- Typical library orientation for 1<sup>st</sup> years
- Brief lecture on patent basics
- Brief exercise searching USPTO & others
- Too little time
- Assessment “one-minute papers” – analysis of 150 qualitative answers challenging



## Meet before optimal 12-oz bottle design



Use Excel to find the profile of a 12-ounce soda bottle with minimal surface area, subject to design constraints. 6



# USPTO.gov Teaching Database Searches



## *PROS*

- Number of records limited
- Usefulness of a specialized database
- Search interface / unique features
- Indexing
- Power of the “Thesaurus” – Current U.S. Classification system



# USPTO.gov Teaching Database Searches



## CONS

- Full-text searching limit to 1976
- TIFF based images and required software
- Navigation within USPTO
- Afternoon sluggishness

**USPTO PATENT FULL-TEXT AND IMAGE DATABASE**

[Home](#) [Quick](#) [Advanced](#) [Pat Num](#) [Help](#)  
[View Cart](#)

Data current through November 14, 2006.

Query [\[Help\]](#)

Term 1:  in Field 1:   
AND

Term 2:  in Field 2:

Select years [\[Help\]](#)

Patents from 1790 through 1975 are searchable only by Issue Date, Patent Number, and Current US Classification. When searching for specific numbers in the Patent Number field, patent numbers must be seven characters in length, excluding commas, which are optional.





# Face-to-Face Instruction Bottle Design

- Patents fundamentals
- Course guide / Self-evaluation assessment
- USPTO
  - Keyword
  - Index to U.S. Patent Classification
  - Class/subclass

**SCIRUS**  
for scientific information only

**Google**<sup>™</sup>

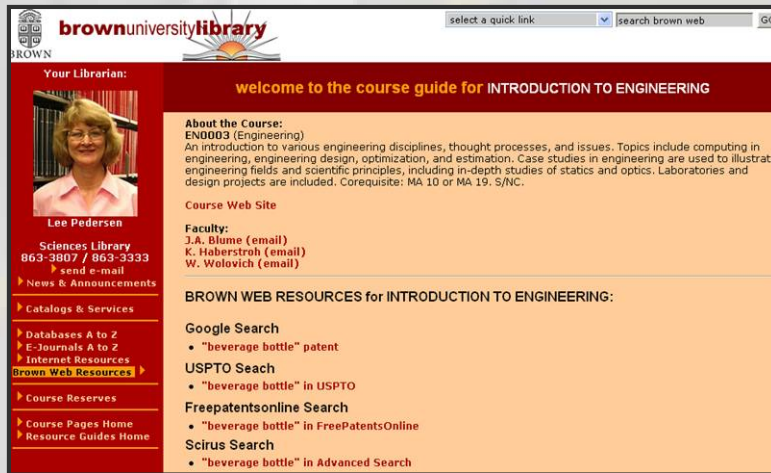
 **freepatentsonline**

**esp@cenet**



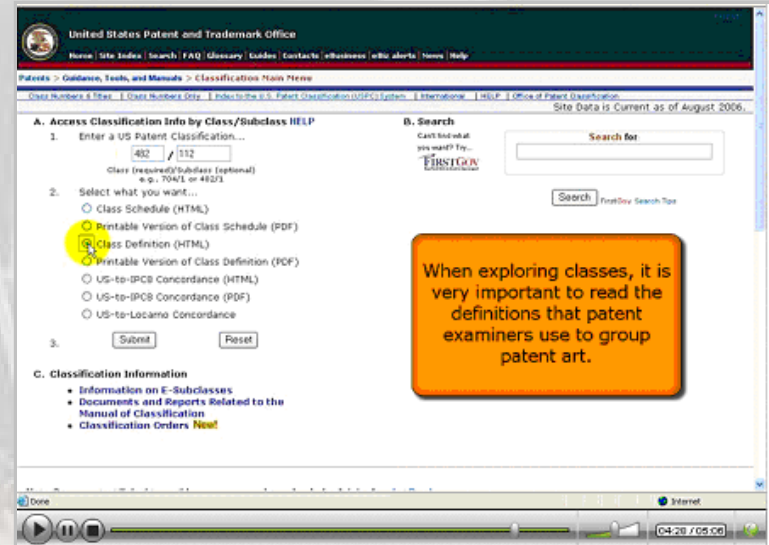
# Virtual Instruction Before 2<sup>nd</sup> Design Project

Shared through EN3 website and Library website



The screenshot shows the Brown University Library website for the EN0003 course. The header includes the library logo and a search bar. The main content area is titled "welcome to the course guide for INTRODUCTION TO ENGINEERING". It features a "Your Librarian" section with a photo of Lee Pedersen and contact information for the Sciences Library. The "About the Course" section describes the course content, including topics like computing in engineering and design projects. Below this, there are sections for "Course Web Site", "BROWN WEB RESOURCES for INTRODUCTION TO ENGINEERING:", "Google Search", "USPTO Search", "Freepatentsonline Search", and "Scirus Search". A sidebar on the left contains navigation links for "Catalogs & Services", "Databases A to Z", "E-Journals A to Z", "Internet Resources", "Course Reserves", "Course Pages Home", and "Resource Guides Home".

Course Guide



The screenshot shows the United States Patent and Trademark Office (USPTO) website. The header includes the USPTO logo and navigation links. The main content area is titled "Access Classification Info by Class/Subclass HELP". It contains a search form with a "Class (required) Subclass (optional)" field and a "Search" button. Below the search form, there are several radio button options for "Select what you want...": "Class Schedule (HTML)", "Printable Version of Class Schedule (PDF)", "Class Definition (HTML)", "Printable Version of Class Definition (PDF)", "US-to-IPC Concurrence (HTML)", "US-to-IPC Concurrence (PDF)", and "US-to-Locarno Concurrence". An orange callout box with a white border is overlaid on the right side of the page, containing the text: "When exploring classes, it is very important to read the definitions that patent examiners use to group patent art." The bottom of the page shows a video player interface with a play button and a progress bar.

“Don’t Reinvent the Wheel”

Screencast

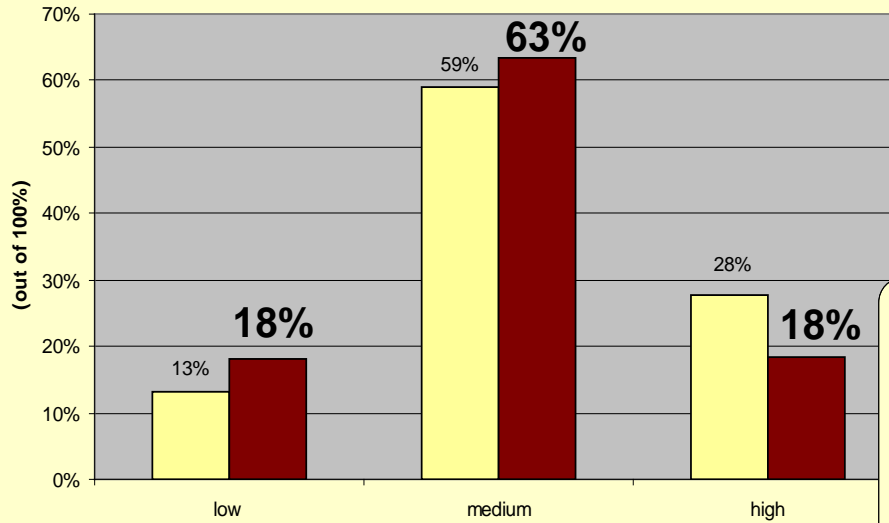
PDF guides to patent searching

“Must not infringe on any known patents”

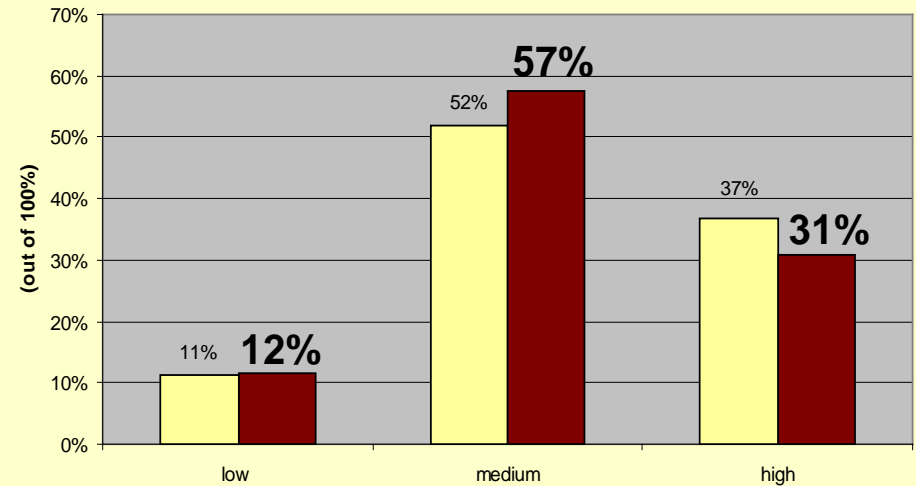


# Self-Evaluation (120 EN3 Participants)

Rate your ability to locate and evaluate information



Rate your ability to integrate information into a research project



■ All respondents Fall 2006 (604) ■ EN0003 respondents (120)



# Impact Evaluation

- End of Semester Survey
  - One per team – 27/38
  - 23 viewed course guide (15 found it useful)
  - 7 viewed the tutorial (6 useful)
- Most reports – no patent search mentioned
- Web stats
  - relatively no use



# Lessons Learned

## *Timeline*

- Customized resources demoed
- Screencast production (~ 40 hrs)
- Instruction before Embodiment & Detail Report (2<sup>nd</sup> of 3) for design of exercise machine

Oct. 3

Begin screencast production

Oct. 4

Face-to-face instruction

Oct. 4

Course guide launched

Nov. 19

USPTO tutorial live

Nov. 29

Group survey announcement

Dec. 8

Final group project report due



# Lessons Learned

## *Content*

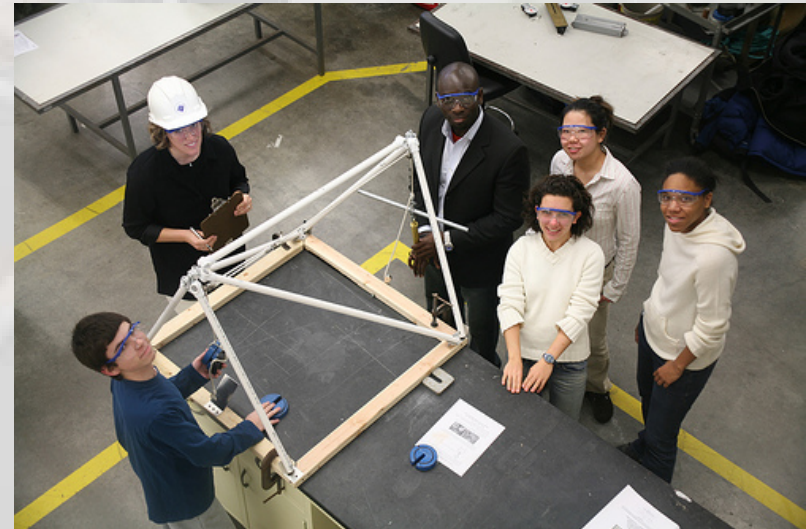
- Augmented virtual instruction materials
- More emphasis on database searching concepts
- How to cite a patent



# Lessons Learned

## *Motivational Drivers*

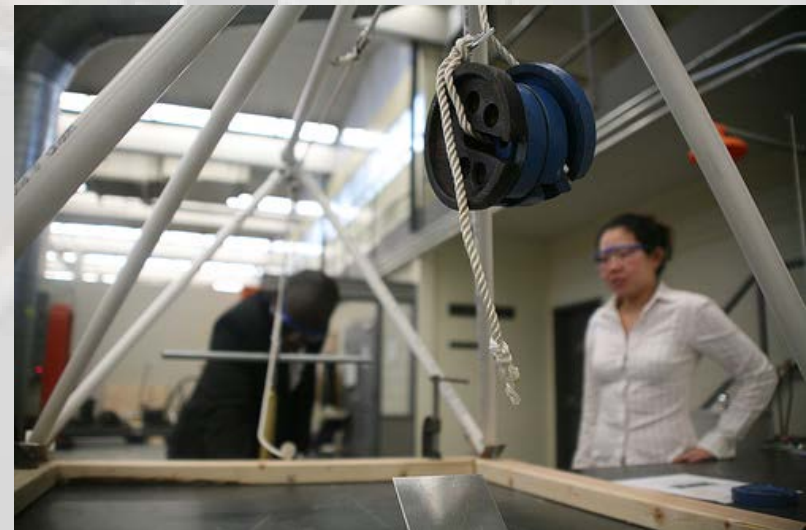
- Low interest – Dynamics of P/F grading and group projects
- Raise expectations – next time no design approval without search effort and report



# Lessons Learned

## *Assessment & Data Collection*

- Revamp both surveys
  - End of instruction (more on database learning)
  - End of semester – individuals (group surveying problematic)
- Better web stats





# Benefits

- Over 60% students had more confidence using databases
- Faculty member- Librarian partnership
- 1<sup>st</sup> Library screencast tutorial
- Course guide to replay instruction searches
- Merging of face-to-face and virtual instruction

