Meeting Instructors Halfway: Use and Non-Use of Digital Learning Materials

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What have instructors told us about their use of digital learning materials

- types
- motivations
- barriers

How do we work to what motivates instructors

How do we reduce the barriers they encounter
More Details about this Research

Colleagues:

- Flora McMartin, Broad-based Knowledge
- Josh Morrill, Morrill Solutions Research
- Ellen Iverson and Cathy Manduca, Carleton College
- Glenda Morgan, George Mason University
- Carrie Ouradnik, University of Wisconsin - Madison

For more details visit

http://serc.carleton.edu/facultypart

We wish to acknowledge the National Science Foundation for their support (DUE-0435398). The findings presented here do not necessarily represent the views of the NSF.
Research Questions

- What do faculty members do with the online digital resources they find at digital libraries, online collections of open educational resources and so forth.
- Do faculty value online educational resources?
- How do they use these resources for teaching purposes?
- What are the barriers to their use of both resources and digital libraries/collections?
Methodology

Focus groups (Fall 2005)

Code transcripts & determine themes

Survey design

Institution recruitment (Higher Education in the US)

Survey delivery (September 2006 - January 2007)

Analysis
Focus Group Findings

- Personal definitions of DLs vary widely
- Very few people knew about NSF DL efforts, OCW efforts, other campus repositories
  - Not naming vs. not knowing
- Barriers to use
  - Information overload
  - Not invented here
  - Google
  - Concern about copyright and use
  - Persistence of resources
Focus Group Themes

1. Characteristics of useful online collections
   — Valued content, valued features, ease of use

2. Faculty work patterns
   — What, how & where they seek, why create/select curriculum, how used in teaching

3. Alignment between DLs and faculty work patterns
   — SOTL, PD, community of practice, research

4. Obstacles to faculty use of DLs
   — Prefer Google, no/low ROI, time consuming, lack of right content, lack of knowledge about DLs

5. Faculty use of Web for P&T purposes
   — Research, Service, Teaching
Survey design

Three Facets of Survey Validity

- Face Validity (does it seem right?)
  - Extensive feedback, meetings

- External Validity (do other people think it clear, cohesive, right?)
  - Pre-test w/ 20 faculty members, representative of sample, 6 in-depth interviews

- Internal Validity (measuring what you think your are measuring? Minimizing error)
  - Reverse coding; Likert scales throughout, factor analysis & reliability testing
Survey implementation

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Survey sections and questions

- Designed to parallel themes from focus group
- Homage to surveys past

Survey recruitment and delivery

- Cold e-mailed almost 3000 higher education institutions
- Approximately 250 responded, and 120 participated
- Local coordinators managed delivery
Participant Demographics

4,678 respondents (4439 who instruct)

STEM and non-STEM faculty are included

Type of Institution
- Other/NR: 4%
- Doctoral: 25%
- Masters: 17%
- 2 Year: 25%
- 4 Year: 29%

Faculty Appointment
- Tenured: 40%
- Non-Tenured: 20%
- Adjunct: 13%
- Librarian: 7%
- Instr./Lec.: 18%
- Other/NR: 3%
Level of Courses Taught

- Introductory
- Advanced
- Graduate
True or False?

• Faculty differ in their use of digital materials based on:

1. Type of institution (community college, teaching institution, research institution)
2. Teaching experience (novice vs. highly experienced)
3. Faculty appointment (adjunct - tenure track - lecturer)
4. Discipline

For each, explain your response
How different are faculty from one another?

When we look at traditionally identified faculty populations, we see few differences.

- The type of institution where they serve
- The amount of time that they have been teaching
- Even discipline is less a factor than expected

As far as these traditional groups go, we have a homogenous population based on the factors we examined

We still believe that there are factors, but they are complex and require further research
<table>
<thead>
<tr>
<th>Description</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of great value to my instruction</td>
<td>60</td>
</tr>
<tr>
<td>Of some value to my instruction</td>
<td>34</td>
</tr>
<tr>
<td>Of no value to my instruction</td>
<td>10</td>
</tr>
<tr>
<td>I do not instruct students</td>
<td>2</td>
</tr>
<tr>
<td>No response</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
What’s Most Popular?

- Digital Images, Visual Materials, Historical Documents
  - Drawings, photographs, video, primary source materials, etc.
- Simulations/animations
  - Illustrations or programs that present a process or concept that is interactive
- Data Sets
  - Online educational, business and government datasets, and scientific research databases
- Teaching or Learning Activities and Exercises
  - Assignments, tutorials, labs, problem sets, etc.
- Online Scholarly Resources
  - Online journals, scholarly articles discussion groups, etc.

Rank in order of most to least used
What’s Most Popular

- Online Scholarly Resources
  - Online journals, scholarly articles discussion groups, etc.

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- Data Sets
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- Simulations/animations
  - Illustrations or programs that present a process or concept that is interactive
How are Resources Used?

1. Presented in Lecture
2. Posted on LMS or course website
3. Used in tests/quizzes
4. Student study aid, for reviews
5. Used in own scholarship
6. PD as teacher
7. Online class discussion
8. Student research or PBL

- Digital Images, Visual Materials, Historical Documents
  Most popular? ________
- Simulations/animations
  Most popular? ________
- Teaching or Learning Activities and Exercises
  Most popular? ________
- Online Scholarly Resources
  Most popular? ________
## Types of Digital Resources

<table>
<thead>
<tr>
<th>Type of Resource</th>
<th>% Use Very Frequently</th>
<th>How Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital images - visual</td>
<td>42</td>
<td>Lecture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prof. Dev. as Teacher</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Study Aid</td>
</tr>
<tr>
<td>Animations</td>
<td>11</td>
<td>Review/Study aid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lecture</td>
</tr>
<tr>
<td>Data Sets</td>
<td>22</td>
<td>Prof. Dev. as Teacher</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Research/PBL</td>
</tr>
<tr>
<td>Teaching, Learning Exercises</td>
<td>28</td>
<td>Review/Study aid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lecture</td>
</tr>
<tr>
<td>Online scholarly resources</td>
<td>49</td>
<td>Prof. Dev. as Teacher</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grants, Scholarship</td>
</tr>
</tbody>
</table>
# Source of Digital Resource

<table>
<thead>
<tr>
<th>Source of Resource</th>
<th>User Created resource</th>
<th>Modified others’ resource</th>
<th>Used others’ resource as-is</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital images</td>
<td>-0.24</td>
<td>-0.15</td>
<td>0.35</td>
</tr>
<tr>
<td>Animations</td>
<td>-1.12</td>
<td>-1.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Data Sets</td>
<td>-1.28</td>
<td>-1.04</td>
<td>0.16</td>
</tr>
<tr>
<td>Teaching, Learning Exercises</td>
<td>0.13</td>
<td>-0.05</td>
<td>0.16</td>
</tr>
<tr>
<td>Online scholarly resources</td>
<td>-1.06</td>
<td>-0.86</td>
<td>0.68</td>
</tr>
</tbody>
</table>

Values are the mean of participant responses. Scale: -2 = very infrequently, +2 = very frequently.
## Why Faculty Are Seeking Digital Resources

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean (SD) Likelihood of Using Collection of Digital Resources</th>
<th>Mean (SD) Likelihood of Using Web Search Engine (i.e. Google, Yahoo, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information that provides students with context for a topic</td>
<td>0.69 (1.49)</td>
<td>1.21 (1.24)</td>
</tr>
<tr>
<td>When I want to find examples that get students excited about a topic.</td>
<td>0.43 (1.50)</td>
<td>1.23 (1.23)</td>
</tr>
<tr>
<td>When I want to find current information for students.</td>
<td>0.59 (1.53)</td>
<td>1.45 (1.06)</td>
</tr>
<tr>
<td>Finding something that illustrates a difficult concept for students.</td>
<td>0.50 (1.51)</td>
<td>0.87 (1.41)</td>
</tr>
<tr>
<td>When I want to provide non-technical background for students.</td>
<td>-0.02 (1.55)</td>
<td>1.06 (1.38)</td>
</tr>
</tbody>
</table>

Scale -2 very unlikely to +2 Very Likely
<table>
<thead>
<tr>
<th>Rank Order</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>improve students’ learning</td>
</tr>
<tr>
<td></td>
<td>stay abreast of professional developments</td>
</tr>
<tr>
<td></td>
<td>helps me keep fresh</td>
</tr>
<tr>
<td></td>
<td>helps students learn difficult concepts</td>
</tr>
<tr>
<td></td>
<td>incorporating DR’s in class is fun</td>
</tr>
<tr>
<td></td>
<td>saves me time</td>
</tr>
<tr>
<td></td>
<td>help me better accommodate students w/ disabilities</td>
</tr>
</tbody>
</table>
## Motivations for Using Digital Resources

<table>
<thead>
<tr>
<th>Mean (All)</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.28</td>
<td>improve students’ learning</td>
</tr>
<tr>
<td>1.24</td>
<td>stay abreast of professional developments</td>
</tr>
<tr>
<td>1.19</td>
<td>helps me keep fresh</td>
</tr>
<tr>
<td>0.92</td>
<td>helps students learn difficult concepts</td>
</tr>
<tr>
<td>0.91</td>
<td>incorporating DR’s in class is fun</td>
</tr>
<tr>
<td>0.80</td>
<td>saves me time</td>
</tr>
<tr>
<td>0.02</td>
<td>help me better accommodate students w/ disabilities</td>
</tr>
</tbody>
</table>

Scale: -2 = strongly disagree, +2 = strongly agree (Biologist means are in parentheses)
Learning to Use Digital Resources

How did you learn about incorporating technology into your teaching?

86% self taught (87%)
54% faculty development program (41%)
42% another instructor (38%)
31% other technology instruction/class (19%)
5% a TA or grad student (7%)

More likely to use collections than search engines to learn about teaching/pedagogy
What are the Barriers?

I would use technology more if.....

<table>
<thead>
<tr>
<th>+/-</th>
<th>Barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>My institution rewarded me for using them</td>
</tr>
<tr>
<td></td>
<td>Technology was more dependable</td>
</tr>
<tr>
<td></td>
<td>More/better training in use of DRs available</td>
</tr>
<tr>
<td></td>
<td>More <em>Useful</em> DR were available</td>
</tr>
<tr>
<td></td>
<td>Had more time</td>
</tr>
<tr>
<td></td>
<td>Had more access to technology</td>
</tr>
<tr>
<td></td>
<td>Greater priority in my institution</td>
</tr>
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</table>

Scale -2 = strongly disagree, +2 = strongly agree
## Barriers to Using Digital Resources

I would use technology more if.....

<table>
<thead>
<tr>
<th>Mean</th>
<th>Barrier</th>
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<tbody>
<tr>
<td>0.94</td>
<td>Had more time</td>
</tr>
<tr>
<td>0.45</td>
<td>More <em>Useful</em> DR were available</td>
</tr>
<tr>
<td>0.42</td>
<td>More/better training in use of DRs available</td>
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<td>0.05</td>
<td>My institution rewarded me for using them</td>
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<tr>
<td>-0.07</td>
<td>Technology was more dependable</td>
</tr>
<tr>
<td>-0.07</td>
<td>Had more access to technology</td>
</tr>
<tr>
<td>-0.37</td>
<td>Greater priority in my institution</td>
</tr>
</tbody>
</table>

Scale -2 = strongly disagree, +2 = strongly agree
Time

Time is not a barrier . . . really!

Everyone has to make decisions about spending time and perform a cost/benefit analysis.

When someone says, “I don’t have time,” it means, “In my priorities, this is lower in rank or it is not worth the cost.”

What is higher priority and what can be done to reduce barriers
Go, Yield, Stop

| Work Practice |  |  |
|---------------|-----------------------------|
|               | Rewarded | Rewards | Unrewarded | Discouraged |
| Easy          |           |         |            |             |
| Difficult     |           |         |            |             |
Confounding factors

- Barriers require activation energy to be overcome
- Intrinsic motivation is a powerful force (but not a limitless reservoir)
- Tradition is yet another powerful driver (change is hard)
- Students can be another powerful extrinsic motivator
- All work practices are different
- Never underestimate the willingness of a motivated individual to ignore you.
### Importance of DL Features

<table>
<thead>
<tr>
<th>Content</th>
<th>Pedagogy</th>
</tr>
</thead>
<tbody>
<tr>
<td>42% peer reviewed &amp; of high quality</td>
<td>12% supplemented w/ materials to explain use in teaching</td>
</tr>
<tr>
<td>41% organized to find quickly</td>
<td>5% supplemented w/ materials to use in Prof. Development</td>
</tr>
</tbody>
</table>

Percentage of respondents who ranked this as most important
Conclusions

- Faculty are more alike than different in use of online digital materials.
- Individuals who stated they valued DRs used them more often within classes (e.g. images).
- Still there are vast differences in usage between classes (Images vs. animations).
- Faculty prefer search for finding materials.
- Barriers to use cannot be simply described.
Meeting Users Halfway

Faculty developers

- Do your faculty know about available resources?
- Offer support for the use of these resources.

Content providers

- What resources are your users seeking (both content and granularity)?
- Offer materials to assist users and faculty developers.
Course design cycle

General course instructional design model

Where is this used?
- Professional designed
- Complete redesign

Expensive both in $$ and instructor time
Reimplementation

- Personal observation
- Design once, make small incremental changes
- Efficient for instructor
Combination

- Cycle through traditional and reimplementation cycles
- Balances cost and efficiency
I’ve talked too long...

What do you see:
Where are your faculty
How do you support what they want to do?
How do you advance what they do?