Open Educational Resources on Science Museum Websites: Best Practices

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Field trips: What & Why

Group trips to sites away from school

- Often involves pre-visit prep, on-site educational activities, & post-visit activities

Benefits of field trips

- Enrich curriculum
- Connect to real world
- Reduce dependence on lab activities at schools (including some activities beyond school budget)
- Offer interdisciplinary connections

Going, Going, Gone?

Forces restricting field trips

- Pressures to meet NCLB (time)
- Budgetary pressures
- Fuel prices (heating + bus fuel)

Alternative

- Online or electronic "field trips"
  - Often in the form of Open Educational Resources (OERs)

OERs Defined

- "Digitized materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research."

  (Centre for Educational Research and Innovation, 2008)

- Reusability and ability to adapt and incorporate are key properties of OERs.
  - Fit better within mandated curriculum.
  - Match better differing pedagogical approaches employed in classrooms.

Our Pilot Study: Method 1

- Research Objectives
  1. Determine what percentage of SMs are using the Web to fulfill educational mission.
  2. Identify which types of OERs SM Websites offer.
  3. Identify best, good, promising and weak practices.
  4. Evaluate the extent to which SMs are embracing an online vision of themselves.

Our Pilot Study: Method 2

- Sampling
  1. Randomly selected 100 self-designated "science museums" from the 2009 Official Museum Directory (OMD).
  2. If SM listed no URL, used search engines to try to locate, then followed up with calls to confirm no Website. Kept in sample.
  3. If SM had Website at start of study but SM closed before we got to its Website, replaced with another randomly selected SM from OMD.
  4. If SM closed after we reviewed its Website, kept in sample.
  5. Final sample
     1. 96 SMs with Websites + 4 without
     2. SMs in 38 states plus Puerto Rico

Our Pilot Study: Method

3

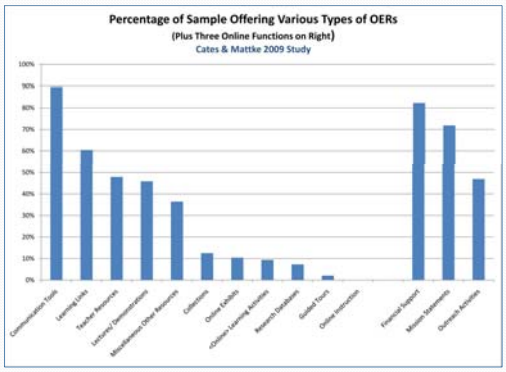
- Analysis
  1. Used Cates & Mattke (2009) OER categorization system
     - Based on earlier Cates & Varisco (2006) for art museums
     - Cates & Mattke study was of public history sites' OERs
  2. Modified categories as Website analysis conducted
  3. Multi-pass unanimous consensus approach
     - Analysis took 9 months of weekly meetings
     - Reviewed about 5 sites per week until first iterative pass complete (rows=SMs)
     - Then analyzed for consistency (columns=types of OERs)
  4. Once all sites analyzed, derived findings and conclusions.

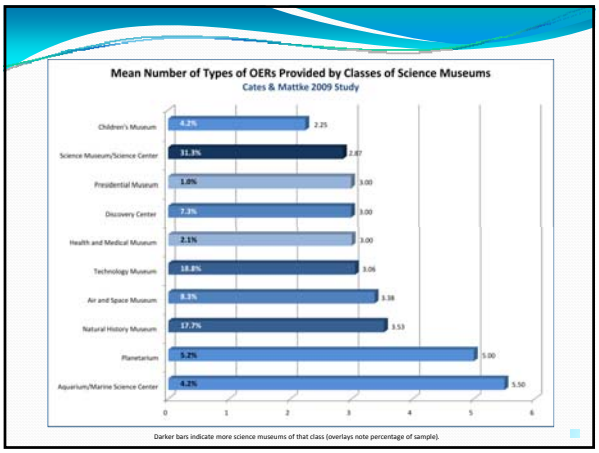
OER Types and Online Functions

1. Online Instruction
2. Online Learning Activities
3. Online Exhibits
4. Guided Tours
5. Teacher Resources
6. Lectures/Demonstrations
7. Collections
8. Research Databases
9. Learning Links
10. Communication Tools
11. Miscellaneous Other Resources

Other Non-OER Functions

- Mission Statements
- Financial Support
- Outreach Activities





General Findings

- Text is still king, often with some images
- Many resources repurposed
  - PDFs of newsletters and brochures,
  - Podcasts of audio wand programs,
  - Images from collections
- OERs that require the most tech skill are the ones least frequently offered.
  - Online instruction (0%)
  - Guided Tours (2.1%)
  - Research Databases (7.3%)
  - Online Exhibits (10.4%)

Finding: Communication Tools (89.6%)

- Email
  - Best practice: Differentiated contact list for **both** ed & content person (14.6%)
  - Good practice: Embedded differentiated contact for **either** ed or content person (36.5%)
  - Weak practice: Generic undifferentiated contact (38.5%)
  - Worst practice: No email link of any kind (10.4%)
- Other Comm Tools
  - Best practice: Ask a Scientist/Expert (7.3%)
  - Good practice: Email/newsletter sign-up (36.5%)
  - Good practice: Social networking tools – Facebook, blogs, MySpace (18.8%)
  - Promising practice: Online surveys (11.5%)

Finding: Learning Links (60.4%)

- Best practice: Individual OER link (34.4%)
  - Link on SM Website takes you directly to the OER.
- Good practice: 1-Click link(16.7%)
  - Link on SM Website takes you to another Website where it takes no more than 1 click to get to an OER.
- Typical practice: Searchable link(53.1%)
  - Link on SM Website takes you to another Website where you can search for useful OERs.
- Bad practice: Intermixing tourism links and educational links.

Findings:

Teacher Support & Online Exhibit Barriers

Teacher resources (47.9%)

- Sites focus more on on-site educational activities
- No teacher section of any kind in 52.1% of sample.
- Two sites used password protection for teacher section.

Online Exhibits (10.4%)

- Key property is that online visitor can have a comparable experience to what would have on-site.
  - Public History Websites include lots of pictures, QTVR and videos of interiors and exteriors of buildings at PH sites.
  - SM exhibits usually interactive, so requires more tech to duplicate on-site experience (videos, Flash, computer games, enhanced podcasts)

Finding: Access to Images for Reuse

- Best practice: Enhanced access (4.9%)
  - Link to download in reasonable size/multiple sizes (often in higher res) **or** passes to Web-based image-editing software like Piknik (www.piknik.com).
- Good practice: Facilitated access (24.4%)
  - Link from smaller image to larger size that can then be accessed by reverse click/ctrl-click.
- Typical practice: User-initiated access (70.7%)
  - User on own. No larger/higher res image and must know to reverse click/ctrl-click to download.
- Bad practice: Putting one's logo or copyright notice across images so useless for reuse.

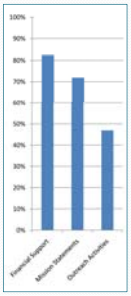
Finding:

Online Functions Related to Site Richness

Sites offering **online donations** (49%)
- Offered significantly more types of OERs on average: 3.79 vs. 2.78 (p=.006).

Sites with **mission statements** (71.9%)
- Offered markedly more types of OERs on average: 3.42 vs. 2.89 (but *NS)*

Sites offering **outreach activities** (46.9%)
- Offered significantly more types of OERs on average: 3.87 vs. 2.75 (p=.002)
- Used significantly more best practices: 2.51 vs. .80 (p=.002)



Conclusions 1

- Leaders in SM field (Innovators + Early Adopters)
  - Offer more types of OERs.
  - Offer more technological sophisticated OERs. [1]
  - Employ higher number of best practices. [2]
- OERs need to be designed to accommodate reuse, particularly in presentations.
- SM Websites can benefit from instructional design and programming skills (Flash & PHP).
  - Perhaps through freelance consulting
  - Recommendation: When coding for on-site at SMs, code for use on the Web.

Conclusions 2

- Business model may need to change.
  - Primarily on-site field trip model may not suffice.
  - New model requires thinking of museum as being more than the physical site and what can be offered there.
  - Museums that survive and prosper likely to be ones able to escape **local** thinking and envision themselves as **global** resources for education.
  - Four in 10 SMs seem to grasp need to enlarge donor base through online donations.
  - In the global market, leaders can dominate by providing a richer online experience.
  - If technology is the way to expand what can offer in terms of OERs, need to view paying for tech services and production as an investment in new business model.

Questions and Discussion

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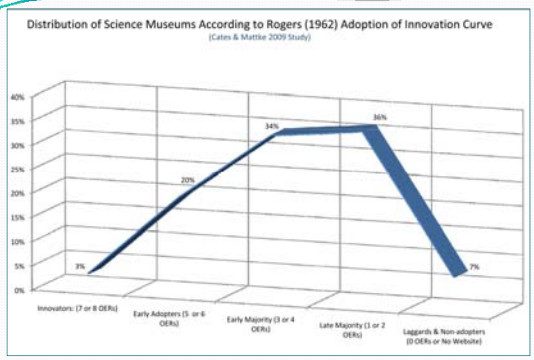
Graphs and other materials posted now.
Manuscript should be posted shortly.



Mean # types of OERs: 3.27 (median=3; mode=4)