

Remedial Evaluation of the Materials Distributed at the
Smithsonian Institution's Annual Teachers' Night
2010

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Acknowledgments

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S.I. Teachers' Night remedial evaluation summary

Teachers' Night is an annual event hosted by the Smithsonian Institution that provides free teaching resources to thousands of teachers, primarily K-12. The goals of Teachers' Night are to raise awareness about the education resources offered by the Smithsonian and to help teachers incorporate Smithsonian collections and resources into the classroom.

The purpose of the Teachers' Night remedial evaluation was to determine if the Smithsonian Institution's second goal for the annual event - 'to help teachers incorporate Smithsonian collections and resources into the classroom' - was being actualized. From this starting point a methodology was adopted to garner information that would help the evaluation ascertain whether the aforementioned goal was being met.

The initial phase of the evaluation involved gathering participants for the study (SCEMS invited S.I. units to submit materials for distribution on Teachers' Night and to take part in the evaluation; five units participated: ACM, NMNH, NMAI, NSRC, and SCEMS). Several meetings took place to decide how the evaluation would proceed. Those participating in the evaluation utilized a web-based tool called 'Basecamp' to track and manage the evaluation process.

The evaluation process involved three stages: a literature review, analysis of comments by teachers on Smithsonian lesson plans (hosted on www.smithsonianeducation.org), and a series of focus groups and in depth interviews with participating teachers. The literature review sought to address two points: what methods do teachers use to find and use lesson plans, and whether lesson plans from museums meet teachers' needs. The focus groups and in depth interviews were initially focused on two questions: what design elements are most important to teachers, and to what extent and in what ways do teachers make use of materials provided by the Smithsonian Institution.

The literature review revealed usability (incorporating navigability) of websites is significant to users of museum websites. Research suggests there are common usability problems for visitors who are non-museum professionals when using museum websites; frustration with overloading of content, distracting graphical user interfaces, browsing not conducive to understanding specific topics, difficulties for non-museum professionals with terminology, and the isolated nature of websites to the physical museums. Regarding the suitability of lesson plans for teachers' use, the literature review presented several key requirements teachers need for museum material to be incorporated into their lesson plans: they must be aligned with curriculum standards, updated, interdisciplinary, related to big concepts, educational, and not dependent on museum visits.

The content analysis of teachers' comments on Smithsonian lesson plans, gathered on www.smithsonianeducation.org, revealed themes in alignment that featured in the literature review, such as the value of material being fun to use, user friendly, interdisciplinary, adaptable, aligned with curriculum standards, and accommodating to the diversity of students. Some of these themes were further highlighted by completing a 'wordle' analysis (software that generates a word cloud depicting

frequency of specific words) of the teachers' comments, which indicated teachers' priority of students, and the resourcefulness of materials.

As the literature review sufficiently addressed the questions of teachers' methods of finding and using museum lesson plans and whether these plans meet their needs, the evaluation at the third stage – focus groups and in depth interviews – was readjusted to ask, in addition to finding out the importance of the design of S.I. materials and how teachers use them, whether teachers are using S.I. materials as intended by each of the units. An 'entrance narrative' highlighted three key elements for teachers: students, multi-layered administration, and their opinion of the Smithsonian. Students are deemed the biggest reward but also the biggest challenge for teachers; the diversity of students and learning gaps (e.g. a child whose first language is not English learning amongst English speaking children) entails difficulties for teachers in their lesson plans. Expectations and requirements from the federal and state level as well as from administration within schools also present a challenge to teachers, one that is not conducive to adapting to the diversity of their students. Teachers see the Smithsonian as a trustworthy resource and are appreciative of the materials gathered from Teachers' Night, as well as the opportunity to take students on field trips and have them engage hands-on activities.

Teachers used Smithsonian materials dispensed at Teachers' Night as resource starting points. They expressed importance for materials to be visually appealing, that are immediately useful, and are durable and versatile. Feedback suggests that teachers are selective when using Teachers' Night materials; such materials do not always fit accordingly into their lesson plans, i.e. the content has to be dissected before it can be implemented. Teachers expressed the desire for the Smithsonian materials to be more readily useable in the classroom. There was no definite indication that participants from the focus groups used the SI materials as intended by the specific SI units.

To further summarize this evaluation's findings:

1. Teachers' entrance narrative is complex

- a. complexity of the students
 - i. families
 - ii. new media
- b. complexity of the administration teachers operate in

2. Students are teachers' top priority

3. Agenda: Time, time and time again

4. Teachers use the materials distributed at Teachers' Night as a resource – starting point

- i. bookmark
- ii. keep for years

5. Adapt to students' diversity and specific situations by deconstructing and reconstructing the materials

In conclusion the outcome of the evaluation, while indicating a degree of success – teachers appreciate Smithsonian services and materials dispensed on Teachers' Night – suggests more work needs to be undertaken to achieve the intended goal of the evaluation, by making Smithsonian materials more readily useable for teachers and for these materials to be aligned with the school curriculum.

Background

Each year, the Smithsonian Center for Education and Museum Studies (SCEMS) hosts 'Teachers' Night'. This event highlights a myriad of Smithsonian Institution (SI) programs and exhibits, and provides free teaching resources to thousands of teachers. The goals of Teachers' Night are¹:

1. To raise awareness about the education resources offered by the Smithsonian
2. To help teachers incorporate Smithsonian collections and resources into the classroom.

The primary audience for Teachers' Night is K-12 teachers. The resources that are distributed are classroom-ready and designed for teachers' use.² The topics and goals of the resources vary depending on the distributing museum.

To determine if Teachers' Night had accomplished its first goal – to raise awareness about the educational resources offered by the SI – SCEMS used onsite and email surveys in 2002, 2003, and 2004 to identify teachers' experiences with and attitudes towards Teachers' Night. Besides demonstrating the achievement of the first goal, the following provides a summary of the other key findings of these evaluations (see Appendix A for a complete summary of the results):

- In each survey, when teachers were asked to indicate the top reasons for attending Teachers' Night, "seeing the museum and exhibits" and "free information/resources" received the highest rankings, while "networking with colleagues" and "meeting with museum educators" received the lowest rankings. This suggests that teachers use Teachers' Night to gather resources (which is the first goal of Teachers' Night), rather than as an opportunity to network and share resources with other educators.
- In the 2004 survey, teachers indicated that Teachers' Night helped increase "students' attention and interest". This finding is particularly important because teachers also indicated that "students' attention and interest" was the most important factor to them when choosing curriculum development activities.
- A 4-month follow-up in the 2004 survey, conducted to compare teachers' intentions at Teachers' Night to their actual behavior, indicated that teachers did in fact "share resources with my colleagues", "visit a museum web site", "[use SI resources for] classroom activities and discussions" and "encourage parents to visit [SI?]", "The survey also showed that there were some discrepancies between teachers' intentions and teachers' behavior. For example, the percentage of teachers who actually "[took a] field trip", "[used] Smithsonian

¹ http://www.education-world.com/a_issues/chat/chat074.shtml

² http://www.smithsonianeducation.org/educators/professional_development/teachers_night.html

products and publications”, “subscribed to Smithsonian educators’ newsletter”, and “[participated] in a professional development activity” was lower than the percentage of teachers who reported that they intended to do so. We can speculate that these behaviors require extra planning, time, and resources that teachers do not usually have.

Remedial Evaluation

The primary purpose of this remedial evaluation was to address the second goal of Teachers' Night:

- To help teachers incorporate Smithsonian collections and resources into the classroom

The information will be used to produce generalizable guidelines for the development of lesson plans made available to teachers by the SI that can be adopted and adapted by the different units (thus, still honoring the diversity of each unit).

This evaluation is a pilot of an inter-unit evaluation project at the SI, as well as a pilot of the proposal of guidelines or best practices to be adopted across SI units.

Methodology

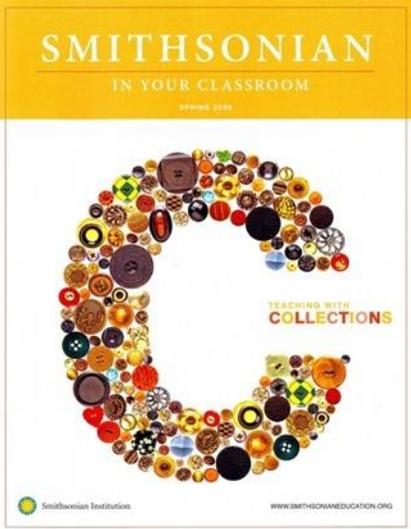
In order to conduct the evaluation SCEMS invited SI units to submit material distributed during Teachers' Night and to participate in the study. The five units that participated were:

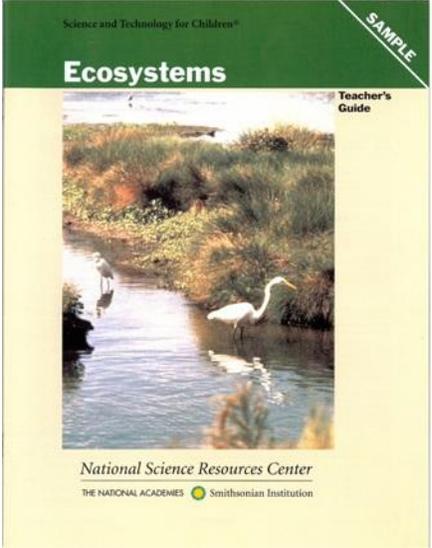
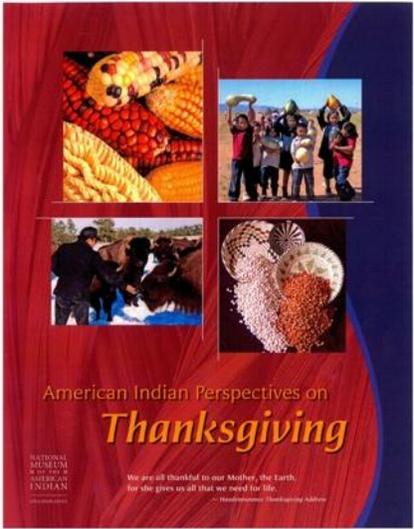
- Anacostia Community Museum (Anacostia; Lynda Maxwell),
- National Museum of American Indian (NMAI; Clare Cuddy),
- National Museum of Natural History (NMNH; Bill Watson),
- National Science Resource Center (NSRC; Claudia Campbell),
- Smithsonian Center for Education and Museum Studies (SCEMS; Michelle Smith).

Two units contributed a lesson plan (NSRC, SCEMS), and three units contributed resource material (Anacostia, NMAI, NMNH).

Materials Distributed at Teachers' Night 2008

Unit	Material Distributed	Intent
<p>Anacostia Community Museum</p>	 	<p>The primary purpose of the educational flyers distributed at Teachers' Night was informational and to direct teachers to our Museum's website for lesson plans and activities regarding community history and after school resources to use in their classrooms.</p> <p>Flyers distributed featured the following URLs:</p> <p>Anacostia website flyer – Community History http://www.anacostia.si.edu/anacostia_history/default.htm</p> <p>Museum Academy Resources flyer http://www.anacostia.si.edu/Museum_Academy/museum_academy_resources.htm</p> <p>Secondary purpose: After getting the flyers, the teachers were to select and download lesson plans and activities that are of interest to them to use in the classroom or to serve as a resource to connect to their classroom curriculum.</p> <p>Questions: We are interested in finding out from the teachers who received these flyers at Teachers' Night the following... 1) Did teachers visit our website after getting the flyer at Teachers' Night? If so, which lesson plan activities did they use? How did they use the resources? 2) If they did not visit the website, why? 3) What is grade level and subject of interest of the teachers?</p>

<p>National Museum of Natural History</p>		<p>The website listed on the postcard provides teachers with a window to the educational resources offered at the museum. These resources include onsite learning opportunities, classroom lesson plans, web-based student activities, other classroom resources, and professional development for teachers.</p> <p>Therefore, the intended use of the postcard was for teachers to visit the website at www.mnh.si.edu/education and explore the school field trip options listed there.</p>
<p>Smithsonian Center for Education and Museum Studies</p>		<p>The intended use of Smithsonian in Your Classroom is as a resource to support classroom instruction. That is, we hope teachers will use the lesson plans or adapt them. Do they use the images but not the lessons? Do they place the print materials in their libraries or share them with friends? Do they come to our website, www.SmithsonianEducation.org, which the publication advertises? Any of these outcomes would be good. Do they give the publication to students (undesired by SCEMS). If the publication encourages teachers to come to the Smithsonian on a field trip, that is a positive outcome, but it is not the priority outcome.</p>

<p>National Science Resource Center</p>		<p>The purpose of the Science and Technology for Children™ (STC®) Ecosystem Sample Lesson that was distributed at SI Teachers' Night 2008 was to introduce teachers to research-based, inquiry-centered science education curriculum. The sample lesson also included the goals of the complete curriculum unit and the concept storyline to demonstrate how lessons/activities of the whole unit build understanding of more complex science principles. The ultimate goal would be that the lesson would spark interest by the teacher, school, and/or school district in learning more about how this type of science education materials could be used in their classroom and why they should be.</p>
<p>National Museum of the American Indian</p>		<p>The intent of the poster was to provide teachers with new approaches for teaching about the Thanksgiving holiday that incorporated cultural traditions of diverse Native Indian tribes. We are concerned that in providing comparative information from a number of tribes, that we did not give enough depth from which teachers could build a substantive lesson. We are eager to know if the information provided did in fact change the teachers' teaching about Thanksgiving; if they used the poster's information, photos, maps to create a new lesson on their own; if they used the discussion questions provided; and if they used the links to NPR interviews with Native leaders.</p>

Meetings

The evaluation team held several meetings to discuss and plan the evaluation. The first meeting took place on January 13, 2008, where the team discussed and agreed upon the purpose of the evaluation. A second meeting was held on April 6, 2009 to share the preliminary findings of the focus groups.

'Basecamp'

A web-based tool called 'Basecamp' was also used to manage and track the evaluation process. Each member of the team was given access to Basecamp through the use of a username and password. Once logged in, team members could create to-do lists, manage milestones, upload and share documents, and message one another.

Evaluation Process

The evaluation process was divided into three steps:

- 1) A **literature review** that addressed two issues:
 - What methods do teachers use to find and effectively use online lesson plans?
 - To what extent and in what ways do lesson plans made available by museums meet the wants/needs of teachers?
- 2) A **content analysis** of the 132 teachers' comments to lesson plans previously posted on www.smithsonianeducation.org in 2008.
- 3) A qualitative method approach – **focus groups and in depth interviews** - to explore:
 - *What design elements are most important to teachers?*
 - *To what extent and in what ways do teachers use the materials made available by the Smithsonian Institution?*

The first step in organizing the focus groups was to send out a screening questionnaire by email to all the teachers who registered for Teachers' Night (approximately 5900 teachers).³

³ If teachers indicated that they participated in Teachers' Night 2008, they were asked about their participation in previous Teachers' Nights, where they lived, what grade and subject they teach, and how long they have been an educator. Next, teachers were shown images of the materials included in the evaluation, and were asked to indicate whether or not they had used it. At the end of the questionnaire, teachers were asked to provide their telephone number so they could be contacted to participate in the focus groups.

Organization of Focus Groups

Teachers were selected to participate in one of four focus groups based on: 1) years of experience as an educator (1-6 years of experience versus 7 or more years of experience), and 2) type of material used (resource versus lesson plans). As a result, four focus groups were conducted.

The focus groups took place on the following dates:

1. March 12 – Teachers with 7 or more years of experience that indicated that they used at least 2 out of the 3 resource materials
2. March 16 – Teachers with 7 or more years of experience that indicated that they used at least 1 out of the 2 lesson plans
3. March 19 – Teachers with 1-6 years of experience that indicated that they used at least 1 out of the 2 the lesson plans
4. March 23 – Teachers with 1-6 years of experience that indicated that they used at least 2 out of the 3 resource materials

The scripts for the focus groups consisted of two parts: collecting the entrance narrative⁴ and discussing the use of the Teachers' Night materials (see Appendix F and G). Since only two teachers participated in focus groups 2 and 4, the same script was used for in depth interviews.

Focus groups and interviews were recorded and transcribed. For the qualitative analysis, the evaluator studied the data for meaningful patterns, and as patterns and trends emerged, grouped together similar responses or behaviors. Each grouping was then assigned a name or category that conveyed the meaning of the data. It is important to keep in mind that qualitative research does not seek to quantify data. Qualitative sampling strategies do not aim at identifying a statistically representative set of responders, so expressing results in relative

Teachers who indicated that they used the materials included in the evaluation were contacted by phone or email to see if they were interested in participating in the focus groups. An incentive of \$50 (American Express gift card) was given to teachers for participating.

⁴ Zahava Doering and Andrew J. Pekarik defined an "entrance narrative" as the internal story line that visitors enter with. The entrance narrative is characterized by three components: a basic framework, i.e., the fundamental way that individuals construe and contemplate the world; information about the given topic, organized according to that basic framework, and personal experiences, emotions, and memories that verify and support this understanding. *Journal of Museum Education*, Fall 1996:20-23.

frequencies may be misleading. Data are analyzed through a holistic approach, which does not attempt to break the evidence into parts, but rather to draw conclusions based on the text as a whole. In most qualitative analyses the data are preserved in their textual form, therefore, quotation in this section of the report illustrates interviewees' thoughts and ideas as fully as possible. The quotations give the reader the flavor of visitors' experience. Qualitative research uses analytical categories to describe and explain social phenomena. These categories may be derived inductively – that is, obtained gradually from the data - or used deductively, either at the beginning or partway through the analysis as a way of approaching the data. For this project an inductive “bottom up” analysis according to Margaret D. LeCompte and Jean J. Schensul (1999) was used.⁵

Initially the data were read and reread to identify and index themes and categories; these may center on particular words, or phrases, or incidents. All the data relevant to each category were identified and examined using a process called constant comparison, in which each item was checked and compared with the rest of the data to establish analytical categories. The key point about the process is that it is inclusive; categories are added to reflect as many of the nuances in the data as possible, rather than reducing the data to a few numerical codes.

Results

First Phase: Literature Review

In order to provide a conceptual framework for the evaluation, a literature review was completed by SCEMS intern, Jennie Ito. The literature review was guided by the following research questions, each of which will be addressed in turn:

- What methods do teachers use to find and effectively use online lesson plans?
- To what extent and in what ways do lesson plans made available by museums meet the wants/needs of teachers?

The most important results were as follows (see Appendix B for a more complete summary of results):

How teachers find and use online lesson plans

1) Vocabulary:

⁵ LeCompte M., Schensul. J. (1999). *Analyzing and Interpreting Ethnographic Data*. 5. Walnut Creek, CA: AltaMira Press, pp. 67-81

- Usability: the ability to use websites and access content effectively⁶
- Navigability: how users find information on a web site⁷
- Heuristics: a set of guidelines that outline best practice for the design of websites, which includes guidelines for visuals, text comprehension and quality, in addition to navigability.⁸

2) Best practices guidelines (or heuristics) and examples

Given the increase in internet use,⁹ the ability to use websites and access content effectively - referred to as usability – has been well documented. In particular, there has been a surge of research concerning how users find information on a website, an aspect of usability called navigability. From this work, researchers have produced a set of guidelines (or heuristics) that outline best practice for the design of websites, and include – in addition to navigability – guidelines for visuals, text comprehension and quality (see Appendix C for a summary of best practices).

3) Review on methods commonly used to evaluate usability

In addition to identifying best practices, researchers have focused their efforts on evaluating the effectiveness of a number of evaluation methods – most notably, direct observation/user testing, log analysis, online questionnaires, and usability inspection methods (specifically, heuristic evaluation) (e.g., Cunliffe, Kritous, & Tudhope, 2001; Harm & Schweibenz, 2001; Rockman, 2005) to evaluate usability. While there are benefits and limitations to using each method (see Appendix D for a summary), a combination of methods is often used, and has been found to be the most effective (Cunliffe et al, 2001).

While some usability (and more specifically, navigability) problems are common to all websites, it is important to recognize that some issues are unique to museum websites. In a recent paper, Marty & Twindal (2004) outlined 15 of the most common usability problems encountered by users of museum websites – which can be grouped into five general categories:

⁶ Garzotto, F., Matera, M., & Paolini, P. (1998) 'To use or not to use? Evaluation usability of museum websites' in D. Bearman and J. Trant (eds.) *Museums and the Web 1998 Proceedings*. CD ROM. Archives & Museum Informatics, 1998 (p. 1). http://www.archimuse.com/mw98/papers/garzotto/garzotto_paper.html

⁷ Koyani, S. J., Bailey, R. W., & Nall, J. R. (2003) 'Research-based web design & usability guidelines', Washington, D.C.: United States Department of Health and Human Services (p. 57). <http://www.usability.gov/pdfs/guidelines.html>

⁸ Goldman, K. H. (2003) 'Investigating Heuristic Evaluation: A Case Study' in D. Bearman & J. Trant (eds.) *Museums and the Web 2003 Proceedings*, CD ROM. Archives & Museum Informatics, 2003. <http://www.archimuse.com/mw2003/papers/haley/haley.html>

⁹ World-wide internet use has increased 444.8% between 2000 and 2010, <http://www.internetworldstats.com/stats.htm> accessed 11/16/10

1. *Museum websites have large amounts of rich content*
 - 1.1. Too much content can frustrate users, making them less willing to spend time with the website.
 - 1.2. Too many choices may lead users to make selections without considering all options.
 - 1.3. Too much content and too many choices may lead users to focus on only one area at the expense of others.
 - 1.4. Too many perspectives on the same content can confuse users looking for information on a specific topic.

2. *Museum websites have artistically designed graphical user interfaces*
 - 2.1. Artistically designed graphical layouts can be disorienting and distracting to users trying to accomplish tasks.
 - 2.2. Artistically designed interface elements can be perplexing and meaningless to users trying to navigate the website.

3. *Museum websites have interfaces that encourage exploration*
 - 3.1. Exploratory interfaces often emphasize random browsing and discourage users interested in exploring specific topics.
 - 3.2. Exploratory interfaces often require users to make choices without understanding the consequences of those choices.
 - 3.3. Exploratory interfaces often fail to include tools that allow users to quickly locate specific known items.

4. *Museum websites are designed by museum professionals*
 - 4.1. Museum professionals often design websites that use organizational schemes unfamiliar to non-museum professionals.
 - 4.2. Museum professional often design websites that use terminology that is unfamiliar to non-museum professionals.
 - 4.3. Museum professional often design websites unable to cope with unanticipated errors that might be made by non-museum professionals.

5. *Museum websites are intended to supplement physical museums*
 - 5.1. Users often have trouble understand the museum website outside of the context of the physical museum.
 - 5.2. Users are often confused by museum websites that lack the cues or support mechanism inherent in physical museums (entrances/exits, other visitors to follow if lost).
 - 5.3. Users are frequently constrained by museum websites that seek to emulate the characteristics of physical museums.

Taken together, the characteristics outlined above provide a conceptual framework for analyzing the usability problems of museum websites, and are useful in both the design and evaluation of museum websites.

What teachers want/need from lesson plans

The review of the literature suggests that teachers are looking for lesson plans that are:

- Aligned with curriculum standards, as teachers are increasingly required to justify the content that they teach in the classroom (Bordac et al., 2003; Borland, 1997; Buffington, 2007)
- Maintained and updated so that they remain current and relevant to users (therefore, the web site has to be easy for museum staff to update) (Bordac et al., 2003).
- Interdisciplinary (Borland, 1997)
- Related to concepts or big ideas (rather than specific) (Buffington, 2007; Gyllenhaal, E. D., & Schaefer, J., 2002).
- Not dependent on a museum visit (Buffington, 2007).
- Educational (i.e., they are not just activities to keep children busy such as coloring pages) (Buffington, 2007).

A front-end, formative evaluation that examined teachers' preferences for online lesson plans, conducted by Gyllenhaal and his colleagues (Gyllenhaal, Beaumon, & Tyree, 2003; Gyllenhaal & Schaefer, 2002), further confirm these findings. From these evaluations, a set of best practices for the design of lesson plans was produced and is summarized in Appendix E.

Second Phase: Content Analysis of Teachers' Comments to Online SI Lesson Plans (www.smithsonianeducation.org)

SCEMS compiled 132 comments teachers posted in 2008 on www.smithsonianeducation.org, creating a rich resource for use in this evaluation (see Appendix E for a list of teachers' comments). A content analysis of teachers' comments was conducted by Pino Monaco, and the results of the analysis revealed themes in alignment with the literature review (see Table 1 and Appendix F).

A second analysis was conducted using 'Wordle', a software program that generates "word clouds" from text (<http://www.wordle.net/>). The clouds give greater prominence to words that appear more frequently in the source text (see Table 2). The fifty most frequent words were selected for the analysis. The results of the analysis revealed themes in alignment with the literature review as well as the content analysis.

When teachers commented on web-mediated lesson plans, they talked about (132 comments collected in 2008):									
Resource characteristics:	Resources that enabled them to:	Cross-disciplinary effect (was this an intended outcome?)	Tried and loved it (this is a person who loves art)	Fun for the students	Can be modified according to my needs	User friendliness	Different students (users) can relate to different components	Aligned to curriculum standards	Motivations
high quality!!!!	discuss	history and literature				grids			I love art
informative and include age-appropriate activities to download	demonstrate	integrated with any subject area				worksheet			it is relevant to a community project
well written and complete/well organized	assign					more links			I have never fished, but I hold great admiration for those who do.
updated	after school follow-up for both students and teachers -created a local group					too small to read			
helped a non-music teacher have a great resource	better understanding					preparation was minimal!			
concepts or big ideas (rather than specific) (Buffington, 2007)	inspire subsequent actions/ give ideas/update curricula					modifiable (e.g., word document instead of PDF)			
do not require a museum visit	create								
In-depth background information (for teachers and students)	explore								
	activate students prior knowledge								
	make connections								
Note: in red are reported new subthemes emerged in the literature review									

Table 2. *Wordle Analysis*

Teachers' Comments posted on www.smithsonianeducation.org



Best Practices (Gyllenhaal & Schaefer, 2002)



Third Phase: A qualitative method approach – focus groups and in depth interviews

The literature review and content analysis revealed that the issues of “how teachers find and use online lesson plans” and “what teachers want/need from lesson plans” have already been extensively addressed. However, it became clear that the two issues of “relative importance of lesson plan design elements” and “how teachers’ use lesson plans” are poorly understood.

Thus, the evaluation of the material distributed at Teachers’ Night was refocused on the following research questions:

- Do the materials distributed at Teachers’ Night meet its intended function? That is, are teachers’ using the materials the way each unit intended?
- In order for teachers to use SI materials, what design elements are most important?
 - How does teachers’ comfort level affect the way they use the materials?
 - What kind of format best facilitates students’ attention and interest?
- To what extent and in what ways do teachers use the materials made available by the Smithsonian?

Focus Groups

Findings:

Entrance Narrative

Teachers’ entrance narrative is complex. There are three key findings in the Entrance Narrative of the focus groups. Students are teachers’ top priority. The first finding is the teachers’ attention to students, which spans across all of the focus groups and is the most predominant theme throughout discussion. A key aspect of how teachers think about their students is the diversity of learning styles and the socio-economic backgrounds that impacts how teachers can construct their lessons and engage students. The second finding is the multi-layered administration of teaching. Administration can be school-based requirements or state-level standards that teachers are expected to meet while also imparting knowledge to their students. The third finding in the Entrance Narrative is the renown of Smithsonian to the teachers. Without being prompted the participants commented on the benefit of having access to the Smithsonian museums and online tools.

Students

Summary:

When talking about the biggest reward and the biggest challenge teachers face in their work, the conversation in the focus groups concentrated on the students. The focus of every teacher was trying to help their students learn the curriculum lessons through methods that personalized the teaching experience for the students who might have behavioral, learning, cultural or motivation challenges. The diversity among the students was a key theme in discussions, especially because not every student is faced with the same challenges. Being able to address all students was difficult for teachers.

Data and Findings:

The teachers participating in the focus groups were a varied group from around the Washington, D.C. metro-area, teaching a range of grades from kindergarten to twelfth grade across a variety of subject areas. Most of the teachers commented that, "*the best part about teaching is that click, when [students] actually get it,*" and having a positive impact on students. [T (3) p. 1] Many said that the students in schools today are so diverse from one another that teachers are greatly challenged to understand a student's ability to learn and "*to continue to differentiate [sic] instruction in our lessons and to adapt to the student's learning.*" [R (4) p. 2] Teachers of younger students feel the most challenged by this diversity because not all kindergarten, first, second, and third grade students have the same language skills due to their cultural and economic backgrounds. In schools today, many students who start school without learning English in their home also have very different foundational knowledge, such as learning different nursery rhymes.

There is also a knowledge and learning gap that exists between students in the classroom. Students have "*different levels of ability to grasp knowledge*" [De (4) p. 3] and "*incredible variety of background and skill knowledge to begin with. You work with kids who have never seen the alphabet, never been exposed to it and kids who are already reading. That diversity of ability and providing curriculum that is meaningful at all those different levels is challenging*" [J (2) p. 2]. Furthermore, teachers are seeing another challenge is "*to keep the students motivated and interested.*" [V (2) p.1] Many teachers commented on the necessity to have eye-catching objects and images, as well as tactile experiences, for students in order to keep them engaged. The material should help teachers to reach out to students who may not learn best through traditional classroom lecturing. One teacher commented "*everything needs to be taught using visual, auditory, and kinesthetic, because every child learns differently.*" [C (4) p.4] Depending on the lesson that the teacher was covering or the different styles of learning of the students, teachers commented that "*it does depend on the group of kids you get. You have to tweak [the lesson] for them. You have to be able to stretch it for some and remediate for others,*" [Do (4) p. 18], and sometimes "*you may adapt it on the fly, so to speak; in other words, as you are, you know, you take off and you adapt it as you need to*" [L (4) p. 22] which may mean that "*what*

you teach and how you teach the first period may not be how you teach the second, third, and fourth periods. But yet using the same material." [L (4) p. 23]

Multi-layered Administration

Summary:

Teachers are finding that teaching curriculum to students is made difficult by the state and national requirements for testing and comprehension that is not conducive to taking the diversity of the student learning into account. Administrators, like principals, at their schools are also burdening teachers with requirements about classroom management and classroom environment. Though teachers are given control over their classroom environment and lesson plans, they feel they are continually evaluated on the elements related to that environment rather than their effectiveness as teachers.

Data and Findings:

Some teachers noted the biggest challenge that they face in their classrooms was the curriculum. Because teachers are compelled to comply with educational standards set by their state department of education there is a prescribed amount of content that must be covered by the end of the school year in preparation for testing. However, teachers feel that the required amount of curriculum takes precedence over the time and comprehension that content requires. *"The challenge would be ... time and trying to figure out how everything can piece together and you can cover everything that you need to cover by the day that you need to cover it."* [A (3) p. 2] As mentioned above, students are a diverse population within the classroom that has staggered levels of comprehension which teachers are trying to adapt to. Teachers end up feeling burdened by state and national level standards that do not allow teachers *"[to] always find time to suit the curriculum to each child"* [T (3) p. 2] and to ensure that *"...as the train goes down the track, everyone is on the train."* [L (4) p. 3]

Teachers also mentioned a direct intervention of the administration in how they incorporate Smithsonian materials, or other educational tools, in the classroom. Many teachers remark they make use of the lesson plans and posters they pick up at Teachers' Night, though they feel that the use of these materials in the classroom can be limited by restrictive policies. Depending on the principal of the school or the county's policy, materials are sometimes strictly an *"opportunity for the students and the teacher to put something they created up for display."* [S (1) p. 36] Others said *"we've got pressure to have all this display area filled with something meaningful."* [J (2) p. 17] and they are being evaluated by their school administration on whether *"everything [is] accessible to the students? Is everything well-labeled? If you are teaching a lesson on ants, for example, you shouldn't have pictures of fire. You probably should have pictures of ants and thorax and different things."* [V (2) p. 17] This kind of evaluation can cause some tension in the classroom for teachers who *"are expected to be continuously refreshing and changing what we have"* [J (2) p. 17], though the research required in

continuously refreshing the classroom environment and lesson plans can occupy a lot of a teacher's time, and as mentioned above, teachers often need to adapt the materials.

One teacher expressed her relationship with the administration at her school to be political: *"I guess when we talk about the administration, I never understood when I did my student teaching why everybody is like, "I love teaching; it's so wonderful to see students learn when they catch the idea and that spark, but I hate the politics of it." Now I do. It's just because of that. You feel like it's almost someone watching over your back, and you have to make sure everything is correct that way."* [V (2) p. 15]

Another level of intervention by the school administration is on student conduct. *"As a teacher, you know you are doing a good job when your students are learning,"* [V (2) p. 15] though some teachers feel like more emphasis is being placed on the environment for learning in the classroom and the inclusion of the right posters, than the spark of learning. Some teachers remark *"the administration is not only judging you on your execution. They are judging you on classroom management."* [V (2) p. 17]

Smithsonian

Summary:

The Smithsonian Institution means many things to the teachers interviewed. First, SI is a recognizable and respected brand that teachers and administrators trust. Second, teachers see SI as a "resource" – a term that they do not define, but which was used to describe a web tool, a research tool, an opportunity for field trips, and a publisher to subscribe to for Smithsonian Magazine. Especially important to the teachers was the proximity of SI to them, where they could organize field trips to the museums.

Data and Findings:

All of the teachers participating in the focus groups were actively using the Smithsonian as a resource. Some teachers were more active in using the posters and lesson plans than others, and all commented that they enjoyed having close by access to SI for field trips. One of the benefits of taking students to SI for a field trip was to introduce the students to Washington, D.C. because *"a lot of our kids have never set foot into DC"* [J (1) p. 13] and *"some of them have never seen or been to a physical museum"* [Do (4) p. 7], even though every teacher being interviewed taught at a Washington, D.C. metro-area school. Bringing students to the National Museum of Air and Space or the National Museum of Natural History was also eye-opening for their students because *"a lot of people, some of our students included, still just think of the Smithsonian as one place"* [A (1) p. 23].

Adding to the idea that SI could mean many things or one thing to people, all participants remarked on the idea of Smithsonian as a "resource". In different focus groups, and without prompting, teachers described SI with the same term "resource" which came to mean

something very similar from teacher to teacher. The breadth of available resources produced by SI means that teachers can search for information, pick up posters or plan field trips that suit the school term, or for a particular group of students. Teachers continue to explore the SI web content and to attend Teacher's Night, to tap into all of the available resources. Here are some examples from focus groups using the term "resource":

"It's just a source to go...I would have to say that the Smithsonian is just such a wonderfully helpful resource." [J (2) p. 12 & p. 23]

"It is an outstanding resource...the Smithsonian in itself is a vast resource for the kids to look up things and then write about things." [L (4) p. 4]

"What I really value the most out of the Smithsonian...it's a resource that is available to us."[J (1) p. 15]

"In the technology world we are living in, it's just such a great resource." [R (4) p.5]

Teachers commented on using the posters more than any other in-classroom resource, but also find that images are captivating for students, so they will use SI websites, images from Smithsonian Magazine, and postcards. Having students engage with the lesson was also important to teachers, which is when they drew on the lesson plans produced for the *Smithsonian in Your Classroom* as experiments or activities that involve students building, constructing, or touching.

Field trips are the resource teachers like to take advantage of the most. As stated above, field trips are trustworthy experiences that administrators do not often contest, and they give students the occasion to travel into Washington, D.C. and visit the objects in person. Several teachers said *"we try to make at least one Smithsonian field trip per year"* [V (2) p. 3] and *"we also kind of vary where we go. This year, we came down and went to one of the performances at the Discovery Theatre, and also took our kids to NMNH to see the dinosaurs and go through the insect zoo. We kind of alternate doing that with taking our kids to the Postal Museum."* [V (2) p.3] Most teachers mentioned that they can justify taking their students to SI because it's a respected educational institution: *"it's very easy to say, "We need a field trip to the Smithsonian." [For] administrators...that is a very easy field trip to justify. It's like, "Yeah, we're going to go, and we're going to talk about community helpers (if we're going to the Postal Museum) or we're going to learn about insects." It's just so easy to flow for the administrators to say yes."* [J (2) p. 15]

Other teachers find creative ways to tie field trips into cross-curricular experiences stating that, *"If I could get with the biology teacher and we write up a rationale as to how a field trip to the Smithsonian would benefit my students from a language arts perspective and her students from a science perspective, that could be a good sell for an administrator, to give the approval and to also help us with funding. If we are able to show that it's going to impact a larger group of kids in an interdisciplinary way – or get with the history teacher to go to NMNH and do an*

interdisciplinary approach, where it's benefitting my language arts kids and benefitting his history and social studies kids." [A (1) p. 36]

Although school administrators often agree that field trips to SI are educational, many teachers remarked that the opportunities are not always available due to funding and planning. Some complications are *"because of budget constraints and time and testing there are lots of other things that eat up [classroom] time...[a field trip] takes a lot of planning...it's just another thing to have to work with in terms of getting permission slips and all."*[A (1) p. 10] The teachers of elective courses in secondary education are feeling the most strain stating that *"I teach [an elective] class and I'm asking my students to miss seven other classes. I'm basically saying that my class trumps or is more important than your math, your science, your history class"* [V (2) p. 16]

Conclusion

Throughout the Entrance Narrative teachers consistently remark that their focus is on creating a learning environment for their students. They are rewarded by the possibility to have a positive impact on students, but are constantly challenged by students' language, learning gaps, and socio-economic diversity. Utilizing the Teacher's Night resources helps them engage students in the lesson, especially when non-traditional methods are used like hands-on activities or field trips. Teachers often feel that the challenges they face in providing a personalized learning experience for their students are the administrative policies and standards.

Key Finding on Smithsonian Materials

Summary:

Teachers use the materials distributed at Teachers' Night as a resource starting point. Teachers were asked to describe how they use the materials circulated at Teacher's Night in their classrooms. They maintain that the materials were of high quality and resourceful. The elements that make them more appealing include having high quality, iconic pictures; being able to laminate the posters or cards; being hands-on or tactile in some way, and; being versatile. Any of these characteristics made materials stand out to teachers and more likely to be collected. In fact, we learned that teachers want to see materials that can have an immediate use, even if they may not use the materials immediately, which leads many teachers to store and bookmark materials regularly. Also, materials with an eye-catching quality were preferred by teachers because they were immediately drawn to them, and knew their students would be too. Typically teachers used only parts (or modules) of the materials in order to address the students' diverse learning styles. They also expressed specifically valuing a "ready to go" quality for the Smithsonian materials, which they described as the ability to immediately recognize and apply the modules to the learning experiences without dedicating time to editing down the materials.

Data and Findings:

Visual Characteristics

When describing the materials that Smithsonian distributes during Teachers' Night, teachers focused on the visual and physical qualities of the materials including paper quality, color, and image. Many teachers emphasized how visual objects are important stating *"it's hard to under-emphasize how visual kids are now. They have to see images. If they are not seeing images, they are not interested."* [J (2) p. 21] Visual images, especially *"anything with bright colors"*, have an immense impact on students, and helps teachers engage students in lessons. [T (3) p.8] Teachers will *"look at what is visually interesting... [because] the kids are going [to] gravitate to them... [especially a] postcard that is bright and colorful and has a great picture, wonderful color, good contrast."* [V (2) p. 8] Teachers commented that the way to use visual elements is to grab the students' attention like advertising. One teacher stated, *"[the materials have] got that hook here for us to want to get it. So we get hooked because we see the visual... we need materials that suck [students] in."* [J (2) p. 9] Images that typically sucked students in are iconic images of famous figures, like Abraham Lincoln or President Barack Obama.

Another key characteristic of the materials is durability. Teachers like visual materials that are made of hardy material so that students can handle them over and over. One teacher commented that *"by the time twenty-four sticky hands have looked it over, it has to be substantial."* [S (1) p. 24] Teachers can also store the materials to use in the future; below are two quotes from teachers who store materials:

"The colors, whatever it is, it's a lot of bright colors - the quality is nice, it laminates well (because I laminate everything)" [A (1) p. 15]

"I love that this is nice quality poster paper. It condenses down easily, so that way we can keep it." [V (2) p. 19]

In addition to using posters and postcards, teachers are using the Smithsonian website for images. One teacher *"pulled up I think two other pictures from the Smithsonian website that have other examples of maize, of Indian corn"* to complement a poster focusing on American Indians and Thanksgiving. [J (2) p.5] A lot of teachers are gravitating towards posters or lesson plans that have websites on the cover remarking, *"I did like that it had a website, the Smithsonian in the Classroom. Anything that had a website and I liked the material, I at least visited the website to find out more about it. Like this ecosystems one didn't have a website component, so I didn't go to the Smithsonian.com to see more about it. But if there was a website, it gave more exploration and more details to whatever I was looking at."* [T (3) p. 14] Once teachers have done online research on topics or materials they find useful for teaching lessons they bookmark: *"I do a lot of bookmarking. I have several sites from the SI that are bookmarked for me,"* [A (1) p. 29] which again shows that teachers are actively storing the information they find useful.

Another mostly universal comment teachers made about students, aside from being visual, is that students respond to hands-on activities. One even commented that "*[students] are better with the hands-on.*" [De (4) p. 20] Some teachers have more accessible ways to incorporate hands-on activities into their curriculum, like through art projects. One commented that, "*the thing that I love the most about teaching art is the hands-on activities... it's that interactive [quality].*" [V (2) p. 1 & p. 12] Other teachers are finding ways to incorporate more hands-on activities into their classrooms by looking in SI lesson plans. One teacher identified a need for "*something that this [sic] more interactive instead of reading the book or looking just at pictures. Getting hands-on, where they can set up their own little aquarium*" as one way to engage students in science learning. [A (3) p. 4]

Content Characteristics

The second most important characteristics teachers commented on were content-related. The term content, as used here, may mean: a) grade-appropriate activities in lesson plans; b) not being overly complicated for students to grasp, and; c) immediately useful or applicable to the curriculum. These three aspects of content are interconnected to one another, and should be considered as different facets of the same theme. Teachers remark that some prepared or pre-packaged materials are not 'ready to go' because they often require additional research, editing down, or adaptation to fit in the curriculum. Materials that achieve all three of these characteristics cited above have a 'ready to go' quality that lessens the amount of time teachers are spending manipulating the materials and are more attractive to teachers who are looking for an easier way to incorporate materials into the learning experience.

Teachers of primary school classrooms emphasized the need to have posters, activities and lesson plans that were appropriate for younger students. The curriculum for grades kindergarten through third grade requires targeted science or history lessons. Teachers recommended including a "*grade span, just right at the top [of the lesson plan]. K-3. Just right on the top...I'm not sure if [something] would be in my grade range. So it would be nice maybe just in the corner, just say, 'K-2, K-3.'* I like seeing things like that when I'm purchasing materials for the classroom. I look for things that do fall in my grade range." [T (3) p. 12]

Another content aspect that primary school and ESL teachers commented on was the complexity of the content featured on posters or in lesson plans. One teacher who taught primary school commented that "*the reading selection [on a poster] would be too much for a third grader.*" [De (4) p. 20] Having too much text is a common issue with the visual materials like posters. Another teacher who taught ESL also spoke about a poster and remarked that "*the backside has got some great ideas on it, but even if I simply read this and took some of the harder words and lowered them, it would still be way too hard for most of the kids...a lot of the quotes are going to again be too hard. I could probably pick out a couple there.*" [J (1) p. 19-20] The recommendation from teachers for the inclusion of text or quotes that appear on posters is to be "*beautiful but sparse, outlines of a lesson plan rather than this, then this, then this...suggestions for tying it in, again as opposed to tons of information on the back.*" [J (1) p.

30] Posters that emphasize the image on them, without a lot of text or content, can be used in many ways, which makes them more appealing to teachers.

Only on a few occasions were materials an exact fit to the curricular needs of teachers, often the content had to be dissected to address the diversity of the students. As an example, when addressing environments teachers would select from the lesson plan the activity of building an aquarium as a hands-on way to engage students in learning about the eco-system. Though the lesson plan provides background material and additional activities, teachers are selecting what fits best for their needs.

Adapting the lesson plan, or parsing the lesson plan, helps teachers cover the curriculum set by state standards within the timeframe of the school year, and helps teachers address the students' varied levels of motivation, engagement, and pace of learning.

Time constraints, curriculum standards, and the diversity of student learning styles all have an effect on how teachers select and collect materials that they plan to use in the classroom. So many teachers remarked that materials they believed to be useful to them at first were never used and that over time, teachers became more selective in choosing materials. Teachers later in their career typically spent less time looking through and sorting materials than did less-experienced teachers. However, all of the teachers expressed a desire to be able to immediately recognize the 'specific' use for Teacher's Night materials. Teachers will pick up materials if *"after I've been looking [at it] for a few minutes and I'm starting to think about what I'm going to do, this one - the Thanksgiving one - I open up and I can use this. I can see what to do with it now,"* [J (1) p. 32] or if *"it breaks it up so that it's easy to read, easy to kind of skim through really quick...looking through, it was something that I could quickly look through"* [A (3) p. 6 & 10]. Material gets rejected immediately *"if it's going to take hours to figure out how to make this fit into my curriculum, and how I'm going to design the lesson plan around it, then it's too much."* [S (1) p. 26]

Conclusion

Our findings demonstrated that teachers are selective about the materials they incorporate into the learning experience. They expressed a need for materials that were easy to use, grade-appropriate and engaging students in a visual or hands-on way. Some posters or images on posters were easily useable in many ways, and teachers commented that they like versatility in the items they collect. Teachers were most attracted to materials they could see an immediate use for, and ones that were eye-catching. They valued materials perceived to have a higher impact on their students. Teachers commented that the burden of some Teachers' Night materials is that they have to be manipulated in order to be used, which ultimately requires more time to prepare.

Overall Conclusion

Throughout the Entrance Narrative teachers consistently remark that their focus is on creating a learning environment for their students. They are rewarded by the possibility to have a positive impact, but constantly challenged by students' language, learning gaps, and socio-economic diversity. Utilizing the Teachers' Night resources helps them engage students in the lesson, especially when non-traditional methods are used like hands-on activities or field trips. Teachers often feel like administrative policies and standards challenge their opportunity to provide a personalized learning experience for their students.

Our findings demonstrated that teachers were selective about the materials they incorporated into the learning experience and that they are using the materials distributed throughout Teachers' Night as a resource, as a starting point. They expressed a need for materials that were ready and easy to use, grade-appropriate and engaging students in an eye-catching or hands-on way. No participants from the focus groups remarked that they were using any of the Teachers' Night materials exactly as they were intended. They were compelled to respond to the diversity and needs of their students which required flexibility during a lesson, and from lesson to lesson. Some posters or images on posters were more easily useable in many ways, and teachers positively commented on the versatility of the items they collected. However, teachers also commented that the burden of some Teachers' Night materials is that they have to be manipulated in order to be used, which ultimately requires more time to prepare.

Appendix A

2002, 2003, AND 2004 TEACHERS' NIGHT SURVEYS

2002 Survey:

1) How many years have you been an educator?

- 1 - 3 years: 28.8%
- 4 - 6 years: 14.9%
- 7+ years: 55.3%
- 30 years:
- 30+ years:
- 35 years: (2)

2) What grade level do you teach or have responsibility for?

- K-12: 31.9%
- Elementary: 29.8%
- Middle/Junior high school: 19.1%
- Senior high school: 8.5%
- College: 0%
- Community Educator: 2.1%
- Library/Media: 6.4%
- Home school: 2.1%

Other:

- Pre-school

3) What subject do you teach? (check all that apply)

- Art: 21.2%
- English/Language arts: 36.2%
- Math: 38.3%
- Music: 14.9%
- Science: 27.7%
- Social Studies: 36.2%
- Special Education: 14.9%

Other:

- All
- Computer Technology
- Deaf
- ESOL (x2)
- Gifted

- Health/P.E.
- Instructional Supervisor
- Inclusion
- Spanish
- Tech Ed
- Technology (x2)

4) Have you attended *Smithsonian Teachers' Night* before?

- Yes: 44.68%
- No: 55.31%

5) How did you hear about this year's event? (choose one)

* Despite instructions to choose only one response, a large number of teachers indicated two or more means of learning about the event. Eliminating all of these surveys would have left a very small pool of evaluations from which to judge.*

- Direct mailing of *Smithsonian Teachers' Night* flyer: 42.6%
- Smithsonian Center for Education and Museum Studies website: 6.4%
- *Smithsonian Teachers' Night* flyer posted in school: 19.1%
- Word of mouth: 40.4%

Other:

- Came highly recommended from graduate professor
- 1st class email – MCPS
- Smithsonian Employee

6) Mark two factors that influenced your decision to attend *Smithsonian Teachers' Night*.

- Demonstrations: 27.7%
- Free information/resources: 87.2%
- Meeting museum educators: 27.7%
- Networking with colleagues: 25.5%
- Refreshments: 17.0%

Other:

- Enrichment
- IMAX
- Quality

7) Did you attend the following? (check all that apply)

- IMAX screening: 80.9%
- Interactive carts: 40.4%
- Storytelling demonstration: 21.3%

8) Would you recommend including these features in next year's *Smithsonian Teachers' Night*?

- IMAX screening: 83.0%
- Interactive carts: 57.4%
- Storytelling demonstration: 42.6%

9) How many school visits have you made to a Smithsonian museum in the past year?

- None: 42.6%
- 1 - 3: 40.4%
- 4+: 21.3%
- After Sept. 11 scheduled visits cancelled

10) Were any of the visits to the Smithsonian a result of a prior *Smithsonian Teachers' Night*?

- None: 36.2%
- Some: 36.2%
- All: 4.3%

11) What would you add or change about *Smithsonian Teachers' Night*?

- Add coffee
- Areas more spread out so that crowds don't develop
- At this time, not a thing.
- Certainly! Great event!!!
- Earlier in the school year, so that new teachers can get ideas
- Everything was great
- Everything was great! How about more hands on demonstrations.
- Great except rainy weather
- Great! Nothing to change
- Have stores stay open past 9pm, only let people take one thing (posters)
- Include more information and classroom teaching aids.
- Its really great the way it is
- It was all excellent wonderful
- It was great as is!
- More curric [sic] guides more books for children
- More demonstrations and activities
- More lists of relevant teaching materials (at Smithsonian) and books
- More than once a year
- NADA 0
- None
- Nothing (x2)
- Nothing – it is a very enjoyable activity as it is
- Nothing it was great!
- Not sure

- Perhaps, not have so many features at one time – while at IMAX, I missed the West African Storytelling
- Please only allow educators and not children to attend. It is our night.
- Perfect and informative and enjoyable as is.

12) What mode of transportation did you use to get to *Smithsonian Teachers' Night*?

- Carpool: 19.1%
- Driving: 34.0%
- Metrobus: 2.1%
- Metrorail: 38.3%
- Walking: 4.3%
- Other: 0%

13) For the last few years *Smithsonian Teachers' Night* has been held on a Friday. Would you attend *Smithsonian Teachers' Night* if it were held on:

- A weekday (Monday through Thursday): 14.9%
- A weekend (Friday through Sunday): 55.3%
- No preference: 31.9%
- Friday
- Friday is best

14) *Smithsonian Teachers' Night* is sponsored by a private company. Prior to this event, were you aware of this company?

- Yes: 17.0%
- No: 83.0%

15) How does knowing that a private company sponsored this event make you feel about the event or this company?

- Appreciative great event
- Depends on the corporate resp [sic] of the company
- Doesn't affect me!
- Don't know the name of the company
- Favorably
- Fine – it is important to have it.
- Glad that private companies are showing interest in education.
- Glad that they are concerned over education
- Great
- Has no bearing one way or the other.
- I appreciate their support, resources and services to educators!
- I felt they shouldn't have had a speaking slot @ pre-reception. Otherwise pretty ok

- I'm pleased that a private company sees the value of this wonderful resource. I'm sorry that more public monies are not available so that private companies would not be required for funding.
- It depends what the company represents
- It has no bearing. A Wonderful event!
- I think it is great that they take an interest in education and the Smithsonian.
- It's nice people help
- No comment
- No difference
- No difference love the stuff
- No different
- No different!
- No opinion
- Nothing in particular
- OK (x2)
- Okay, because I had to ask who the private co. was
- Positive
- Thankful to them
- That's very generous of the company.
- They care about the education of our children – and ensuring our educators make maximum use of our available resources. Thank you!
- Very good the best accommodations were made possible together

2003 Survey:

Teacher's Night Exit Survey Results

Survey is based on 147 Respondents unless otherwise noted

- 1) Have you attended Smithsonian Teacher's Night before?
 - Yes--38%
 - No--61.9%
- 2) As a result of attending Smithsonian Teachers' Night do you plan to:
 - (Q2a) use Smithsonian resources in your classroom
 - Yes--93%
 - No--2.7%
 - NR--4%
 - (Q2b) visit a Smithsonian museum or research center with your classroom
 - Yes--78.2%
 - No--11.5%
 - NR--10.2%
- 3) How did you learn about Smithsonian Teachers' Night (mark one or more)
 - (Q3a) Direct mailing of flyer--14.9%
 - (Q3b) E-mail notice--29.9%
 - (Q3c) Flyer posted/distributed in school--12.9%
 - (Q3d) Save the date Postcard--5.4%
 - (Q3e) Website--10.8%
 - (Q3f) Word of mouth--30.6%
 - (Q3g) Other--8.8%
 - NR--0.6%
- 4) What are the two main factors that influenced your decision to attend? (mark two)
 - (Q4a) Activities--43.5%
 - (Q4b) Curricular interest--49.6%
 - (Q4c) Free information/resources--77.5%
 - (Q4d) Meeting Museum educators--17.6%
 - (Q4e) Networking with colleagues--17.6%
 - (Q4f) Prize drawing--8.1%
 - (Q4g) Refreshments--20.4%
 - (Q4h) Other--6.8%
 - NR--0.6%
- 5) How would you rate the following activities: (circle one response for each activity)
 - (Q5a) IMAX screening: *Straight Up!*
 - Poor--0%
 - Fair--0.6%
 - Good--10.2%
 - Excellent--22.4%
 - Superior--26.5%
 - Did not participate--3
 - NR--4.7%

(Q5b) Planetarium Show: *Infinity Express*

Poor--0%
 Fair--1.3%
 Good--2
 Excellent--9.5%
 Superior--10%
 Did not participate--60.5%
 NR--15.6%

(Q5c) Exhibition preview: *The Wright Brothers*

Poor--0%
 Fair--0%
 Good--4%
 Excellent--21.7%
 Superior--14%
 Did not participate--46.9%
 NR--12.9%

(Q5d) Book Signing: Joy Hakim

-Joy Hakim did not attend

6) How would you rate your overall experience at Smithsonian Teachers' Night?

Poor--0.6%
 Fair--1.3%
 Good--17.6%
 Excellent--42.1%
 Superior--32.6%

7) How many years have you been an educator?

1--11.5%
 2 to 10--46.9%
 11 to 20--19%
 More than 20--19%
 NR--3.4%

8) What is your school district?

Alexandria City Public School (9)
 Arlington County (5)
 Arlington Diocese (5)
 Baltimore County? (1)
 Catholic University
 Charles County (4)
 Chesterfield (1)
 College/University (3)
 Community? (1)
 DC Public School (19)
 Diocese of Virginia (1)
 Fairfax County Public Schools (38)
 Falls Church City Schools (1)

George Washington University (1)
 Hanover County (2)
 Howard University (1)
 John Hopkins University (1)
 Loudoun County (2)
 Manassas City Public School (6)
 Montgomery County (7)
 NR (11)
 Prince George
 Prince George Community College (1)
 Prince George County (17)
 Prince William (4)
 TJ Williams High School
 Washington and MD (1)
 Washington Diocese (1)
 WPS (1)

- 9) What grade level do you teach or have responsibility for?
- (K) K to12--20.4%
 - (E) Elementary School Middle/Junior High School--29.2%
 - (SH) Senior High School--15.6%
 - (L) Library/Media--1.3%
 - (H)Home School--.6%
 - (C) College--3.4%
 - (CE) Community Educator--0%
 - (O) Other--1.3%
 - NR--2.7%

- 10) What subject do you teach? (mark one or more)
- (Q10a) Art--20.4%
 - (Q10b) English/Language Arts-41.8%
 - (Q10c) Math--37.7%
 - (Q10d) Music--13.2%
 - (Q10e) Science--43.8%
 - (Q10f) Social Studies--37.7%
 - (Q10g) Special Education--13.2%
 - (Q10h) Other--10.6%
- 49 out of 147 surveyed did not respond.
 Results based on 98 respondents

11) On which days would you attend Smithsonian Teachers' Night if it were held in the evening:

(Q11a) Monday--16.4%

(Q11b) Tuesday--9.7%

(Q11c) Wednesday-9.7%

(Q11d) Thursday--17.5%

(Q11e) Friday--69.3%

(Q11f) Saturday--32.9%

(Q11g) Sunday--9.7%

50 out of 147 surveyed did not respond.

Results based on 97 respondents

2004 Survey:

Smithsonian Teachers' Night 2004

Evaluation and Recommendations

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Two Studies

- *Onsite Survey*
 - 1054 participants
 - Filled out on the night of the event
 - 82% women
- *E-Mail Survey*
 - Invitation and one follow-up (March)
 - 1532 participants out of 5081 invitations
 - 30.1% response rate

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Response by Location

Location	Percentage
DC	63.33%
Arizona	19.61%
District of Columbia	11.57%
Hawaii	5.41%

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Preferred method of contact

Method	Percentage
Email Newsletter	76.4%
Open House	44.2%
Print Newsletter	31.1%
Online Video Presentations	13.8%
School Liaison	11.9%

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Top three reasons attended

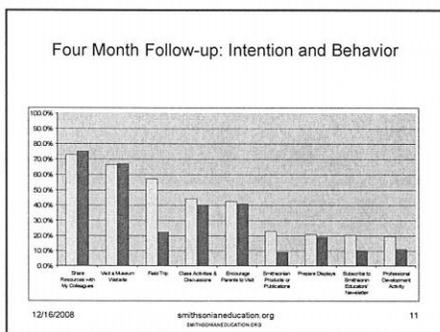
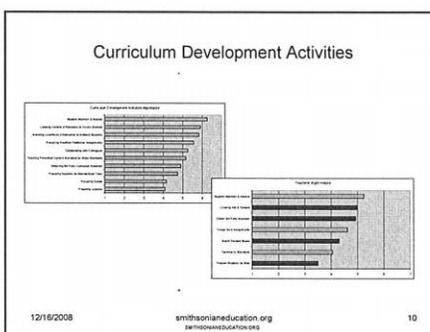
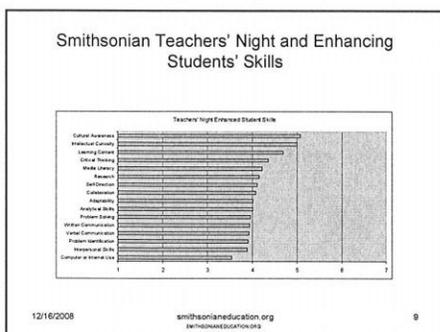
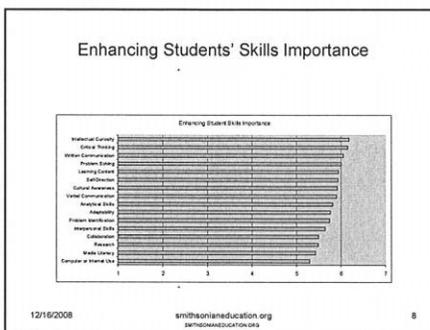
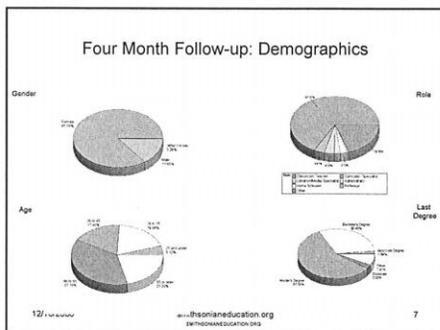
Reason	Percentage
Seeking to learn about exhibits	80.7%
Participating in activities	74.2%
Attending to see exhibits	64.8%
Attending to see speakers	38.7%
Participating in a competition	35.1%
Attending to see a special exhibit	24.7%
Participating in a workshop	13.8%
Participating in a tour	7.8%

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Four Month Follow-up: Answered the Survey and Attended the Event

Location	Percentage
Maryland	25.07%
Virginia	25.81%
District of Columbia	5.96%
Kansas	9.17%
Arizona	9.17%
DC	9.17%
Washington	9.68%
Nebraska	7.33%

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- ### Elementary School Teachers
- **Emphasize**
 - preparing students for standardized testing (VA)
 - matching materials for different capabilities of students
 - enhancing students' interpersonal skills
 - **De-emphasize**
 - Obtaining 3rd party materials
 - Designing new and non-traditional assignments
 - Learning new content
 - Preparing lectures
 - Enhancing students' research skills
 - Developing analytical skills
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Middle School Teachers

- Emphasize
 - obtaining 3rd party materials
 - enhancing students' research skills
 - enhancing students' written communication
 - enhancing students' analytical skills

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High School Teachers

- Emphasize
 - syllabi preparation
 - preparing lectures
- De-emphasize
 - preparing students for standardized tests
 - matching level of instruction to different students
 - enhancing students' skills in computer or internet use
 - enhancing students' skills in collaboration and interpersonal skills

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Recommendations

- Higher Emphasis on materials
 - Investigate Arizona's materials design and process replicate and improve
 - D. C. based event needs more emphasis on materials
- Target Materials
 - Specific levels of Students
 - All
 - Intellectual curiosity
 - Critical thinking
 - Written communication
 - Problem-solving

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Four open-ended questions

- *How have your experiences during Smithsonian Teachers' Night been useful in supporting your work as an educator?*
- *What did you most enjoy about Smithsonian Teachers' Night?*
- *How do you encourage or require your students to use the Internet?*
- *Do you have any other comments about Smithsonian Teachers' Night?*

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Clustering using Text Analysis

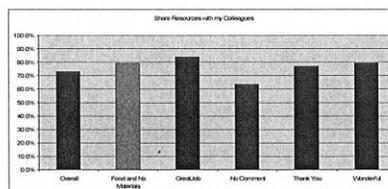
- *extracts*
 - *tokens (a word or group of words)*
 - *terms (a token with assigned meaning)*
 - *concepts (nouns and noun phrases), and entities (Smithsonian)*
- *cluster analysis procedure*
 - *assigns numerical values to each based on their association with each other and the participants' response to the item*
 - *organizes response into categories*

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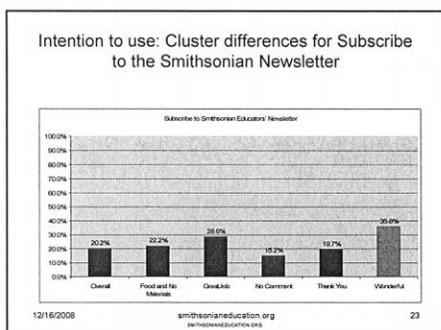
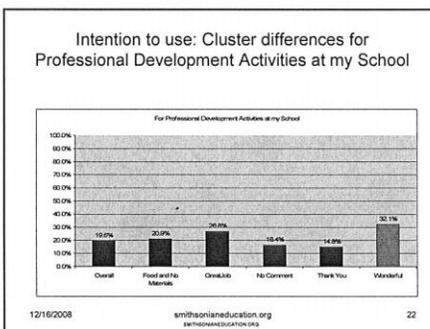
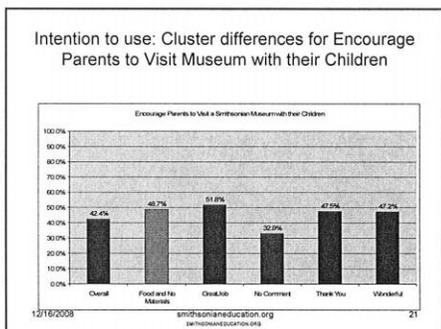
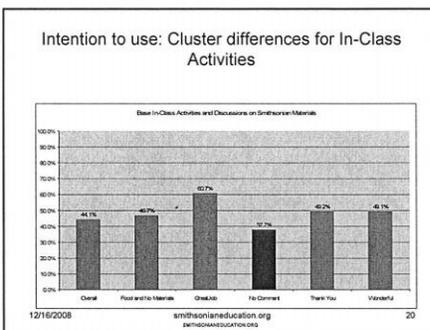
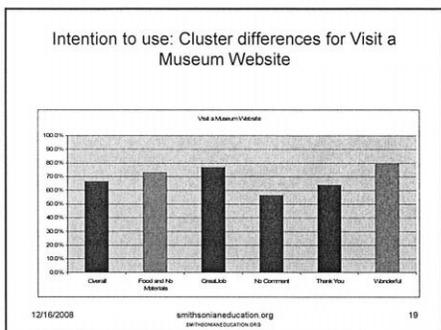
Intention to use: Cluster differences for Share Resources with my Colleagues



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Appendix B

READING LIST WITH SUMMARIES

Navigability and Usability of Websites (both general and museum specific websites)

On Websites:

- Kelly, L., & Breault, K. (2007) 'Developing educational websites: investigating internet use by students and teachers' in E. Nardi (ed.) *Thinking, evaluating, rethinking: Proceedings from ICOM-CECA 2006 Conference*, Universita' Tre, Rome. <http://www.audience-research.wikispaces.com/file/view/educational+websites+study+paper.pdf>

Type of Resource:

Paper presented at the ICOM-CECA annual conference.

Summary:

The purpose of this paper was to provide the Australian Museum with guidance on how to best develop a website that meets the needs of student and teachers.

Central Questions:

1. How do teachers use the internet?
2. What makes a great educational web site from a teacher's perspective?

Methodology:

A series of five focus groups were conducted with primary and secondary teachers to: 1) learn how teachers use the internet, and 2) identify the factors that make a good web site. Teachers were asked to review a list of web sites a head of time; the chosen web sites were a mix of museums, art galleries, and general sites.

Findings:

How do teachers use the internet?

Teachers used the internet to search for lesson plans, or materials for developing their own lesson plan.

What makes a great educational web site from a teacher's perspective?

Content needs to be closely linked to curriculum, easy to follow, and presented in an attractive and interesting way.

Information must be concise, up-to-date, easy to access and download.

Has a “search engine” (where they can search for material by keyword, subject, or level), is multi-lingual; uses copyright-free images; has a “what’s new” section, highlights upcoming events and exhibitions, contains a glossary

- Koyani, S. J., Bailey, R. W., & Nall, J. R. (2003). *Research-based web design & usability guidelines*. Washington, D.C.: United States Department of Health and Human Services. <http://www.usability.gov/pdfs/guidelines.html>

Type of reference:

Unpublished research report.

Summary:

This paper outlined 209 design and usability guidelines developed by the U.S. Department of Health and Human Services (HHS), in partnership with the U.S. General Services Administration. The purpose of the guidelines is to assist those involved in the creation of Web sites to base their decisions on the most current and best available evidence.

Key points:

Each guideline is rated for: 1) “relative importance” (i.e., how important is this guideline to the success of a web site), and 2) “strength of evidence”; and includes graphic examples and references. This article offers a great and simple comparison for best practice.

- Rockman, S. (2005). ‘Assessing the outcomes of interactive websites’ in *Proceedings of Web Designs for Interactive Learning Conference, Website evaluation* (pp 2-11) Ithaca, NY: Cornell Lab of Ornithology and The Exploratorium.

http://www.rockman.com/publications/articles/Assessing_the_Outcomes.pdf

Type of resource:

Paper presented at the Web Design for Interactive Learning Conference.

Summary:

This paper outlined different evaluation methods used in the evaluations of websites. This author confuses methodologies (e.g., web log analysis) with methods (e.g., surveys, focus groups, etc.). We also use a different interpretation of “impact.”

Key points:

EVALUATION METHODS	INFORMATION PROVIDED
WEB LOG ANALYSIS	<ul style="list-style-type: none"> • number of users, how long users stay on-line, what pages/activities they do, what path they take to access web pages, what sites users link from
USER SURVEYS	<ul style="list-style-type: none"> • what users are doing, knowing, and leaving with (demographics,

(E.G., EMAIL, POP-UPS)	attitudes and beliefs, behaviors and experiences, user's wants and needs)
FOCUS GROUPS (E.G., FACE-TO-FACE, ON-LINE)	<ul style="list-style-type: none"> what users really want as opposed to what you think they want (interests in concepts, appeal of web site, preferred language, existing understanding of concepts, usability)
WEB USAGE DIARIES	<ul style="list-style-type: none"> if the way users use the website changes over time
USER COMMENTS:	<ul style="list-style-type: none"> identifies things that will help generate more interest and activity on the web site
INSTITUTIONAL DATA	<ul style="list-style-type: none"> if users are using the web site to find specific types of information or for specific purposes
ASSESSMENTS OF LEARNING	<ul style="list-style-type: none"> what the user has learned
HEURISTIC EVALUATION	<ul style="list-style-type: none"> identifies content and usability problems
OFF-SITE ACTIONS:	<ul style="list-style-type: none"> if users are using the resources provided on the web

Things to consider when doing an evaluation:

- Although assessing usability (i.e., "Can they do it?") is important, it is equally important to access impact (i.e., "Did they do it?")
- Be realistic about the magnitude of change you can expect when evaluating outcomes
- No best method, depends on what you are trying to achieve
- Remember that the web has two audiences: intended and actual
- Evaluations should be part of the process, not an after-thought

Museum specific readings:

- Borun, M. (2005). 'Evaluating museum exhibits and online programs' in *Proceedings of Web Designs for Interactive Learning Conference, Website evaluation* (pp 2-11) Ithaca, NY: Cornell Lab of Ornithology and The Exploratorium.
http://www.rockman.com/publications/articles/Assessing_the_Outcomes.pdf

Type of resource:

Paper presented at the Web Design for Interactive Learning Conference.

Summary:

This paper discussed the difference between evaluating museum exhibits and evaluating museum online programs, and is summarized in the table below.

	EXHIBIT	WEB
AUDIENCE	<p><i>Is known:</i></p> <ul style="list-style-type: none"> Locals and tourists, with known or measurable characteristics 	<p><i>Is unknown:</i></p> <ul style="list-style-type: none"> Primary (intended) audience differs from the secondary (actual) audience Secondary audience tend to be more global.
GOALS	<p><i>Defined:</i></p> <ul style="list-style-type: none"> Apply to a single exhibit or program Impact of whole visit measured in terms of visitor satisfaction (vs. learning) 	<p><i>Broad:</i></p> <ul style="list-style-type: none"> Multiple and varied Apply to a whole website (comparable to whole museum)
MEASURING OUTCOMES	<p><i>Measurable:</i></p> <ul style="list-style-type: none"> Audience in a limited area allows for tracking and timing, unobtrusive observation, and exit interview 	<p><i>Difficult to measure:</i></p> <ul style="list-style-type: none"> Audience is readily available allows for dwell time measures, tracking progress through site, exit interviews
METHODOLOGICAL STRENGTHS	<ul style="list-style-type: none"> Can have face-to-face conversations and observe exhibit use 	<ul style="list-style-type: none"> Can collect large samples quickly, try multiple methods, and check server logs
WEAKNESSES	<ul style="list-style-type: none"> Process is time consuming and labor intensive 	<ul style="list-style-type: none"> Feedback is less than precise

Questions to consider:

1. What is the unit of assessment? What makes sense for your site? Is it the whole site? Is the site a game, or a single experience, or is it a complex, institutional website that has multiple components with different purposes that you might want to look at separately?
 2. Who is the audience? Is it the target audience, the actual audience, or both? If it's both, you have to evaluate at different time using different methods. For websites, evaluation doesn't end at launch. As the website continues, the user population continues to evolve and you need to tap into it periodically.
 3. Who defines the outcomes? The website designer, the client, or both?
 4. Who requires the evaluation? Is it just the funder? Are you doing evaluation because you have to? Or are you doing it because it's going to inform your process, make a better site, and help you keep site current, active, and in touch with its audience?
- Cunliffe, D. Kritou, E. & Tudhope, D. (2001). 'Usability evaluation for museum websites', *Museum Management and Curatorship*, 19(3), 229-252.

Type of resource:

Peer reviewed journal article.

Summary:

This case study on a summative evaluation of a museum website examined four evaluation methods to determine the benefits and limitation of each method; direct observation, log analysis, online questionnaires, and usability inspection methods (specifically, heuristic evaluation).

Key points:

evaluation method	benefits	limitations
DIRECT OBSERVATION/ USER TESTING ("think-aloud" method)	<ul style="list-style-type: none"> • Relatively cheap and fast • Can identify usability problems with few users • Useful in identifying problems related to user needs and captures users' subjective impressions 	<ul style="list-style-type: none"> • The context, tasks, and motivation to conduct the task may be artificial; subjects might not be representative of actual users
LOG ANALYSIS (collection and analysis of web access logs)	<ul style="list-style-type: none"> • Cost effective • Data is quick and easy to analyze • Data can be collected continuously • Captures changes in user behavior over time 	<ul style="list-style-type: none"> • It can be difficult to identify visitors and define sessions • Not always accurate at capturing data; data captured is limited (captures what the user did, but not why the user did it) • Difficult to identify usability problems
ON-LINE QUESTIONNAIRE	<ul style="list-style-type: none"> • Useful in gathering demographic, technical and visit information • Relatively cheap • Provide useful information on actual user behavior; which can be used for the long-term development and maintenance of a site 	<ul style="list-style-type: none"> • Sample is self-selecting • Large sample size needed • Information elicited is not always useful
USABILITY INSPECTION METHODS (comparison against a set of criteria/guidelines)	<ul style="list-style-type: none"> • Does not require users • Considered a more rigorous method • Useful in identifying technically oriented problems 	<ul style="list-style-type: none"> • Expensive (if experienced evaluators are used) • Often identifies usability problems that actual users do not perceive as problematic

The case study concluded that a combination of methods is most effective.

- Goldman, K. H. (2003) 'Investigating Heuristic Evaluation: A Case Study' in D. Bearman & J. Trant (eds.) *Museums and the Web 2003 Proceedings*. CD ROM. Archives & Museum Informatics, 2003. <http://www.archimuse.com/mw2003/papers/haley/haley.html>

Type of Resource:

Paper presented at Museums and the Web annual conference.

Summary:

This paper described a case study in the beginning of stages of development at the Atlanta History Center. The focus of the study was to examine the effectiveness of heuristic evaluation in evaluating museum websites. The goal was to increase the accessibility of the museum's online educational materials and resources, ensure their on-line publications met state curriculum standards, and increase the number of teachers and students using the web-mediated educational materials.

Key points:

What is heuristic evaluation?

1. A usability inspection method where experts (or non-experts, who have some training in usability principles) compare the project against an established set of criteria or guidelines, known as heuristics (e.g., simple and natural language, speak the users' language, be consistent, among others).
2. It is the least formal of all usability inspection methods, meaning it is based on rules of thumb and the skills of the evaluators; evaluators can be expert or non-experts – but not end users.
3. The first step in heuristic evaluation is to decide which set of heuristic to use (because there are many different types).

Why evaluate at all?

1. It encourages museum educators to clarify their goals and accomplish their objectives
2. It can be scary because a project with unclear objectives and no evaluation can always be described as successful.
3. While the usability of a web site is important, the fact that a website is usable does not make it de facto valuable, or even used – therefore, both aspects must be addressed in an evaluation.

- Harm, I. & W. Schweibenz (2001) 'Evaluating the Usability of a Museum Website' in D. Bearman & J. Trant (eds.) *Museums and the Web 2001 Proceedings*. CD ROM. Archives & Museum Informatics, 2001. <http://www.archimuse.com/mw2001/papers/schweibenz/schweibenz.html>

Type of Resource:

Paper presented at Museums and the Web annual conference.

Summary:

The study had two aims: 1) evaluate the effectiveness of three evaluation methods (the “think-aloud” method, heuristic evaluation, and a questionnaire), and 2) evaluate the usability of the Saarland Museum’s website to improve it. The authors also discussed the benefits and limitation of different heuristics.

Methodology:

This study used the “think-aloud” method, heuristic evaluation, and a questionnaire to evaluate the museums’ website.

“Think-aloud” method:

12 students and five teachers were asked verbalize their thoughts, and comment on their actions while they worked on nine tasks that represented potential usability problems (e.g., hidden links, insufficiently linked information).

Heuristic evaluation:

16 grad students with usability training served as evaluators, and used heuristics from “Heuristics for Web Communication”: displaying information, navigation, text comprehension, and role playing (i.e., author-reader relationship)¹⁰.

Questionnaire:

Asked students and teachers to comment on the course of the tasks

Central Questions:

1. What are the benefits and limitations of direct observation/user testing (“think-aloud” method), inspection methods (heuristic evaluation), and questionnaires?
2. What are the benefits and limitations of different heuristics: complex heuristics (e.g., “Heuristics for Web Communication”), simple heuristics (e.g., Molich & Neilson’s 10 basic heuristics¹¹), and complex checklists (e.g., Keevil’s Usability Index¹²)?

¹⁰ Coney, M. & Steehouder, M. (2000). Role playing on the web: Guidelines for designing and evaluating personas online, *Technical Communication*, 47(3), 327-340; Farkas, D, and Farkas, J. (2000), ‘Guidelines for designing web navigation’, *Technical Communication*, 47(3), 341-358; Williams, T. R. (2000), ‘Guidelines for designing and evaluating the display of information on the web’, *Technical Communication*, 47(3), 383-396; Spyridakis, J. H. (2000), ‘Guidelines for authoring comprehensible web pages and evaluating their success’, *Technical Communication*, 47(3), 359-382.

¹¹ Molich, R., and Nielsen, J. (1990). ‘Improving a human-computer dialogue’, *Communications of the ACM*, 33(3), 338-348.

¹² Keevil, B. (1998). ‘Measuring the usability index of your website’, paper presented at the annual Special Interest Group on Systems Documentation, Quebec City, Quebec.

Findings:

What are the benefits and limitations of the “think-aloud” method, heuristic evaluation, and questionnaires?

EVALUATION METHOD	BENEFITS	LIMITATIONS
“THINK-ALOUD” METHOD	<ul style="list-style-type: none"> • Provided large amounts of qualitative data that showed how users use the web site • Showed the reactions of actual users 	<ul style="list-style-type: none"> • Labor intensive • Laboratory setting might have made the interaction artificial
HEURISTIC EVALUATION	<ul style="list-style-type: none"> • Relatively simple and fast • Detected usability problems that were not observed with the other evaluation methods (because users do not realize they cause problems because they lack background knowledge in web design) 	<ul style="list-style-type: none"> • Experts could not ignore their own knowledge of the subject
QUESTIONNAIRE	<ul style="list-style-type: none"> • Inexpensive, simple, and fast 	<ul style="list-style-type: none"> • Answers were not very reliable; they did not corroborate with users actual experiences

What are the benefits and limitations of different heuristics: complex heuristics (e.g., “Heuristics for Web Communication”), simple heuristics (e.g., Molich & Neilson’s 10 basic heuristics), and complex checklists (e.g., Keevil’s Usability Index)?

TYPE OF HEURISTICS	BENEFITS	LIMITATIONS
COMPLEX HEURISTICS (e.g., work to ensure that users will view and notice links, design the interface to readily reveal the underlying information structure)	<ul style="list-style-type: none"> • Rather than a simple checklist, the guidelines are designed as statements and questions that guide the evaluator to identify usability problems • They are both design and evaluation oriented 	<ul style="list-style-type: none"> • They are complex and might be difficult for non-experts to use

SIMPLE HEURISTICS (e.g., speak the users' language, be consistent)	<ul style="list-style-type: none"> • Simple • Speak the user's language 	<ul style="list-style-type: none"> • Do not provide a lot of guidance for evaluators
COMPLEX CHECKLISTS (e.g., Can you find the information you want? Does the information look like a quality product?)	<ul style="list-style-type: none"> • Checklist format makes it simple to use 	<ul style="list-style-type: none"> • The usability index is influenced by how users interpret each question (because it is calculated (yes/yes+no))

- Marty, P. & Twidale, M. (2004) 'Lost in gallery space: A conceptual framework for analyzing the usability flaws of museum websites', *First Monday*, 9(9). Retrieved November 3, 2008, from http://www.firstmonday.org/ISSUES/issue9_9/marty/

Type of resource:

Peer reviewed journal article.

Summary:

This paper outlined a conceptual framework for analyzing the usability flaws specific to museum websites.

Methodology:

Usability evaluations of 36 museums websites were conducted through direct observation/user testing. Evaluations lasted 30 minutes, and only involved one or two participants who were given different representative scenarios of use.

Central Question:

What are the most common types of usability problems faced by users of museum websites?

Findings:

Analyses identified 15 dimensions that exemplify the most common usability problems encountered by users of museum websites (which can be grouped into 5 categories) (see page ?)

In order to improve the usability of museum websites, designers need to be aware of potential problems and acknowledge possible usability trade-offs

- Peacock, D. & Brownbill, J. 'Audiences, Visitors, Users: Reconceptualising Users Of Museum On-line Content and Services' in J. Trant and D. Bearman (eds) *Museums and the Web 2007: Proceedings*. Toronto: Archives & Museum Informatics, published March 31, 2007 at <http://www.archimuse.com/mw2007/papers/peacock/peacock.html>

Type of Resource:

Paper presented at Museums and the Web annual conference.

Summary:

The authors of this paper questioned how and how well we know the museum website user, and argued that some of the established concepts of “audience” are neither relevant nor useful to museum websites, and prevent us from better understanding the needs, motivations, and expectations of museum website users.

Key points:

1. Museum websites have been influenced by visitor studies, marketing, evaluation and usability analysis – which are quite distinct in their assumptions and methodological approaches.
 2. The audience for websites is anyone on the internet – therefore, a website audience cannot be developed
 3. Too much emphasis has been put on understanding who the audience is, and not enough on what they want and do
 4. When designing and evaluating websites, it is important to:
 5. Recognize that museum web sites exist within a marketplace
 6. Be clear about site goals, from market, organizational, and user perspectives; and design in accordance to these goals
 7. Design an information space, not a replica of the physical museum
 8. Test with target users, over and over, at every stage of design and development
 9. Evaluate in terms of your (market) goals, not just according to the demographics of users or the product features of the site
- Polillo R. (2004). *Il check-up dei siti web*. Milano: Apogeo.
<http://www.rpolillo.it/IUM/slide.htm>
 - Wetterlund, K. (2007, May). ‘How to help teachers find your on-line resources.’ Museum-Ed Blog. Retrieved November 7, 2006.
http://www.museum-ed.org/component/option,com_jd-wp/Itemid,29/p,36/

Type of Resource:

Blog entry by Content Developer (Sandbox Studios) and Museum-Ed Editor Kris Wetterlund.

Summary:

The author outlines strategies to help teachers find museum’s on-line resources.

Key points:

1. Define key words, and refine them by using the key words to search the web (as this often leads to more key words).
2. Send a description of the project and keywords to search engines such as Google so they can include them on their own listing of topics

3. Request listings on teacher's sites or blogs (e.g., museum-ed).

Teachers' Use of Museum Web-mediated Lesson Plans:

- Bordac, S., Brucken, C., Blanshay, L., Geft, L., & Samuels, E. (2003). 'Developing Online Teacher's Resources at the Museum of Tolerance: A Case Study in Innovation and Evolution', in D. Bearman & J. Trant (eds) *Museums and the Web 2003 Proceedings*. [CD ROM]. Archives & Museum Informatics, 2003. [2008, November 12]. <http://www.archimuse.com/mw2003/papers/bordac/bordac.html>

Type of Resource:

Paper presented at Museums and the Web annual conference.

Summary:

This paper outlined the development of a web-based Teacher's Guide for the Museum of Tolerance (located in Los Angeles, CA), and the lesson learned throughout this process. The museum's objective was to meet the needs of teachers using on-line technology, while ensuring that the Museum's core values were reflected at each stage of development.

Central Question:

What information do teachers want and need from museum websites?

Methodology:

Focus groups were conducted with four distinct groups of teachers (with varying degrees of computer experience and knowledge): 1) teachers that had participated in earlier focus groups used to shape the Teacher's Guide, 2) teachers scheduled to visit the museum, 3) teachers that had visited the museum in recent months, and 4) teachers who demonstrated commitment to the educational mission of the museum. Teachers were asked to explore the museum's website, fill out a questionnaire, and participate in a brief interview. The sessions focused on content needs and organization, as well as web site design and usability.

Findings:

What information do teachers want and need from museum websites?

1. Lessons need to align with curriculum standards - teachers are increasingly required to justify the content that they teach in the classroom
2. In order to make the web a useful tool, it must be maintained and updated so that it remains current and relevant to users (therefore, the web site has to be easy for museum staff to update).

Other lessons learned:

1. Teachers use the web to prepare for their lessons (e.g., learn more about the content that they teach).

2. Teachers will use materials on the web differently depending on their level of experience (e.g., experienced teachers are more likely to adapt lesson plans, or use the material to supplement an already existing lesson plan).
 3. Teachers need to be critical partners in shaping web-mediated materials because they know their classrooms best.
- Borland, C. (1997) 'ArtsEdNet: Assessing an arts education website', in D. Bearman & J. Trant (Eds.) *Museums and the Web 1997 Proceedings*. [CD ROM]. Archives & Museum Informatics, 1997. [2008, November 12].
<http://www.archimuse.com/mw97/speak/borland.htm>

Type of Resource:

Paper presented at Museums and the Web annual conference.

Summary:

The purpose of this paper was to provide the Getty Education Institute for the Arts with guidance on how to achieve their goal of providing teachers with high quality art education resources.

Central Question:

What information are teachers looking for on museum websites?

Methodology:

The data was gathered from web site comment forms, on-line focus groups, email discussion groups, questionnaires from potential visitors.

Findings:

What information are teachers looking for on museum websites?

1. related images to be placed in the context of the lesson plan (otherwise, they are not useful to teachers)
 2. lesson plans that adhere to, and specify how they meet state and national curriculum standards
 3. interdisciplinary lesson plans
- Buffington, M. (2007, May). 'How do Teachers and Students Use Museum Websites?' Talk presented at the American Association of Museums Annual Meeting, Chicago, IL.

Type of Resource:

Talk presented at the American Association of Museums Annual Meeting.

Summary:

This talk examined how teachers and students use museum websites.

Central Questions:

1. How can we help teachers find on-line museum resources?
2. How do teachers use lesson plans?

Methodology:

Pre-service teachers were asked to describe and evaluate on-line educational resources from 30 art museum websites.

Findings:

How can we help teachers find on-line museum resources?

Simplicity and language are important:

- it is easier to navigate if the titles and the location of links are kept consistent, searchable database
- teachers are searching for resources under headings such as “education”, “teachers”, and “schools” – not embedded in tabs (e.g., “about us”)
-

What are teachers looking for in lesson plans?

Teachers are looking for lesson plans and ideas that are related to concepts or big ideas (rather than specific); related to both state and national standards, are interdisciplinary, do not require a museum visit, and have educational value (i.e., they are not just activities to keep children busy such as coloring pages).

- Gyllenhaal, E. D., & Schaefer, J. (2002). ‘Front-end evaluation of the On-line Teacher Resources project: Final report.’ Unpublished manuscript, John G. Shedd Aquarium, Chicago, IL. <http://selindaresearch.com/SheddOnlineTeacherResourcesFront-End.pdf>

Type of Resource:

Unpublished research report.

Summary:

This front-end evaluation of the On-line Teachers Resources project (conducted by Selinda Research Associates) examined teachers’ preferences for on-line resources, how they find and use on-line lesson plans, and recommends best practices.

Central Questions:

1. What information do teachers want and need from on-line resources?
2. How do teachers find and use lesson plans?

Methodology:

Data was collected using: in-depth telephone interviews, questionnaires, and a series of four focus groups. Teachers had varying degrees of computer experience, and taught grades K-12.

Findings:

What information do teachers want and need from on-line resources?

Materials that fill specific needs related to their curriculum (sometimes they are looking for ideas to design a lesson around, but most often they are looking for information to complete a lesson they are already developing). Some teachers expressed that their curriculum was highly structured, leaving little room for them to incorporate material that doesn't fill a specific curriculum-related need.

Materials for their own use in lesson planning and materials students can use on or off-line (because not all students and teachers have access to classroom computers).

To be able to quickly identify the topics and concepts covered by on-line lessons and activities.

Contain in-depth background information (for teachers and students).

Information to be provided in both an easy to read on-screen format and a printer-friendly format (i.e. HTML and PDF).

References to state, national, and literacy standards (not all teachers were concerned about state/national standards, but it is important to include it for those who are concerned about them, and to show that you are aware of the challenges teachers face)

How do teachers find and use lesson plans?

Teachers used 4 major strategies to find on-line resources for lesson planning:

1. Search engines
2. Consulting knowledgeable people
3. Using trusted websites
4. Consulting printed sources (e.g., textbooks, magazines, newspapers)
- 5.

It is important to note that teachers seem naïve in judging the credibility of web material, and few seemed to systematically apply accepted guidelines for evaluating educational websites.

Most teachers adopt only parts of lessons plans found on the web – most likely because of professional pride (designing unique and personalized lesson plans is important to some teachers), time and budget restraints, and the need to adapt materials to the abilities and interests of their students.

- One exception to this are teachers that have to teach something new or something they are not completely comfortable with – these teachers might rely more heavily on someone else's resources

Although teachers pick-and-choose from on-line lesson plans, many said that they still prefer on-line resources to be formatted in a lesson-plan style (this way they can easily go to the few parts they are interested in).

- Because not all teachers shared this view, it is important to consider other possible methods to support teacher's pick-and-choose behavior
- Gyllenhaal, E. D., Beaumont, L., & Tyree, A. (2003). 'Formative evaluation of the On-line Teacher Resources Project: Final report', Unpublished manuscript, John G. Shedd Aquarium, Chicago, IL. <http://www.selindaresearch.com/SheddOnlineTeacherResourcesFormative.pdf>

Type of Resource:

Unpublished research report.

Summary:

This formative evaluation of the On-line Teachers Resources project (conducted by Selinda Research Associates) identified ways to improve the lesson plans included on the website.

Methodology:

Data collection included: a heuristic evaluation of the website using the best practices outlined by Gyllenhaal and Schaefer, 2002; an on-site user test with one high school teacher; and 10 questions on an email survey (the survey was completed by 15 high school teachers).

Key points:

This paper provides a good example of a heuristic evaluation using the best practices outlined by Gyllenhaal and Schaefer, 2002, as well as other potentially useful resources (e.g., an outline version of best practices for the design of web-mediated lesson plans, survey for teachers).

- Horwitz, R., and C. Intemann (2007, April) 'We Are Your Audience' in D. Bearman & J. Trant (eds) *Museums and the Web 2007 Proceedings* [CD ROM]. Available: Archives & Museum Informatics, 2007. [November 12, 2008].
<http://www.archimuse.com/mw2007/papers/horwitz/horwitz.html>

Type of Resource:

Paper presented at Museums and the Web annual conference.

Summary:

This article discussed how teachers evaluate and use museum websites in the classroom. The authors suggested that providing teachers with outlines, teaching ideas, suggestions, and internet links would be more valuable than trying to design a "one-size fits all" lesson plan.

Key points:

In their experience, teachers do not use lesson plans in their entirety. Instead, teachers tend to pick and choose the parts of the lesson plan that they like and find most useful.

Most teachers teach the same units each year, and all teachers must meet curriculum standards. This leaves little room for deviation – although some subject areas (e.g., language arts) have more leeway than others (e.g., math).

When teachers find a successful lesson, they tend to use it year after year with only slight modifications.

Museum websites should provide easy access to information, activities and collections – and must be have “immediate accessibility and appeal for the teacher to even open it up and explore.” (pp. 5)

- Wetterlund, K. (2007, May) ‘How do Teachers and Students Use Museum Websites?’ Talk presented at the American Association of Museums Annual Meeting, Chicago, IL.

Type of Resource:

Talk presented at the American Association of Museums Annual Meeting.

Summary:

This talk examines how teachers and students use museum websites.

Central Questions:

1. Why do some teachers not use on-line museum resources?
2. How do teachers use lesson plans?

Methodology:

Observations are gathered from several years of conducting focus groups and working with teachers on museum projects and national digital art library pilot in K-12 schools.

Findings:

Why do some teachers not use on-line museum resources?

Problems with accessibility; many schools block sites, have unreliable internet connections, or insufficient software

Figuring out how to meaningfully incorporate museum resources into the classroom can be challenging (this barrier is often expressed by teachers as a “lack of time”)

Issues with navigability; many teachers cannot find museum resources, teachers access the website at different points, website cannot be searched using keywords or phrases, problems with terminology

How do teachers use lesson plans?

Teachers do not use lesson plans as museums educators design them, instead they break the material apart and pick and chose the pieces that are most useful to them. The author suggests that this does not mean that museums should not continue to provide teachers with lesson plans. Rather, it highlights the fact that teachers do not need to concern themselves with which lesson format to use, or what standards to reference, etc. Lesson plans are formats teachers are comfortable with, and they provide teachers with useful resources.

Teachers tend to use the same lesson plans repeatedly. Therefore, they count on resources being there over time. Museums need to ensure that they leave their lesson plans up, and only change them if it is necessary to update a section.

- Wetterlund, K. (2006, June) 'Museums, teachers and lesson plans', Museum-Ed Blog, retrieved November 7, 2006. http://www.museum-ed.org/component/option,com_jd-wp/Itemid,29/p,19/

Type of Resource:

Blog entry by Content Developer (Sandbox Studios) and Museum-Ed Editor, Kris Wetterlund.

Summary:

The author conducted an informal poll of teachers to find out if teachers use “lesson plans written by someone else”. Not one teacher said yes – but they went on to say that they read museum lesson plans and got ideas from them.

Key point:

This highlights that importance of asking the right questions to elicit information from teachers.

Appendix C

BEST PRACTICES FOR USABILITY

The following is a summary of three best practices for usability:

- I. Heuristics for Web Communication
- II. Nielsen's ten usability heuristics
- III. Research-based web design & usability guidelines

I. **Outline for Heuristics for Web Communication** (Coney & Steehouder, 2000; Farkas & Farkas, 2000; Williams, 2000; Spyridakis, 2000)

1. *Displaying information on the Web* (guidelines for visuals):
 - how to design and arrange display elements
 - how to ensure that text is readable
 - how to use pictures, illustrations, icons and motion
2. *Designing Web Navigation* (guidelines for navigation and orientation):
 - how to design orientation information on each page
 - how to coordinate navigation devices
 - how to design site-level orientation information
3. *Designing and evaluating the display of information on the web* (guidelines for text comprehension and text quality):
 - how to select, design, and organize content
 - what style to use
 - what makes Web pages credible and trustworthy
4. *Designing and evaluating personas online* (discusses the typical rhetorical roles of the implied author and reader of the Web pages and their rhetorical roles)
 - how rhetoric is used to describe author roles and reader roles
 - what kind of relationship exists between author roles and reader roles

II. **Nielsen's ten usability heuristics** (Molich & Nielsen, 1990; Nielsen, 1994; Nielsen & Molich, 1990)

1. *Visibility of system status*
 - The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.
2. *Match between system and the real world*

- The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.

3. *User control and freedom*

- Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

4. *Consistency and standards*

- Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

5. *Error prevention*

- Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.

6. *Recognition rather than recall*

- Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

7. *Flexibility and efficiency of use*

- Accelerators – unseen by the novice user – may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

8. *Aesthetic and minimalist design*

- Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

9. *Help users recognize, diagnose, and recover from errors*

- Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

10. *Help and documentation*

- Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

III. **Outline of Research-based web design & usability guidelines** (Koyani, Bailey, & Nall, 2003)

1. *Provide Useful Content*

- 1.1. Establish User Requirements
- 1.2. Understand and Meet User's Expectations
- 1.3. Involve Users in Establishing User Requirements
- 1.4. Set and State Goals
- 1.5. Focus on Performance Before Preference
- 1.6. Consider Many User Interface Issues
- 1.7. Be Easily Found in the Top 30
- 1.8. Set Usability Goals
- 1.9. Use Parallel Design
- 1.10. Use Personas

2. *Optimizing the User Experience*

- 2.1. Do Not Display Unsolicited Windows or Graphics
- 2.2. Increase website Credibility
- 2.3. Standardize Task Sequences
- 2.4. Reduce the User's Workload
- 2.5. Design for Working Memory Limitations
- 2.6. Minimize Page Download Time
- 2.7. Warn of 'Time Outs'
- 2.8. Display Information in a Directly Usable Format
- 2.9. Format information for Reading and Printing
- 2.10. Provide Feedback When Users Must Wait
- 2.11. Inform Users of Long Download Times
- 2.12. Develop Pages that Will Print Properly
- 2.13. Do Not Require Users to Multitask While Reading
- 2.14. Use Users' Terminology in Help Documentation
- 2.15. Provide Printing Options
- 2.16. Provide Assistance to Users

3. *Accessibility*

- 3.1. Comply with Section 508 (specific to US government web sites)
- 3.2. Design Forms for Users Using Assistive Technologies
- 3.3. Do Not Use Color Alone to Convey Information
- 3.4. Enable Users to Skip Repetitive Navigation Links
- 3.5. Provide Text Equivalents for Non-Text Elements
- 3.6. Test Plug-Ins and Applets for Accessibility
- 3.7. Ensure that Scripts Allow Accessibility
- 3.8. Provide Equivalent Pages
- 3.9. Provide Client-Side Image Maps
- 3.10. Synchronize Multimedia Elements

- 3.11. Do Not Require Style Sheets
- 3.12. Provide Frame Titles
- 3.13. Avoid Screen Flicker

4. *Hardware and Software*

- 4.1. Design for Common Browsers
- 4.2. Account for Browser Differences
- 4.3. Design for Popular Operating Systems
- 4.4. Design for User's Typical Connection Speed
- 4.5. Design for Commonly Used Screen Resolutions

5. *The Homepage*

- 5.1. Enable Access to the Homepage
- 5.2. Show All Major Options on the Homepage
- 5.3. Create a Positive First Impression of Your Site
- 5.4. Communicate the website's Value and Purpose
- 5.5. Limit Prose Text on the Homepage
- 5.6. Ensure the Homepage Looks like a Homepage
- 5.7. Limit Homepage Length
- 5.8. Announce Changes to a website
- 5.9. Attend to Homepage Panel Width

6. *Page Layout*

- 6.1. Avoid Cluttered Displays
- 6.2. Place Important Items Consistently
- 6.3. Place Important Items at Top Center
- 6.4. Structure for Easy Comparison
- 6.5. Establish Level of Importance
- 6.6. Optimize Display Density
- 6.7. Align Items on a Page
- 6.8. Use Fluid Layouts
- 6.9. Avoid Scroll Stoppers
- 6.10. Set Appropriate Page Lengths
- 6.11. Use Moderate White Space
- 6.12. Choose Appropriate Line Lengths
- 6.13. Use Frames when Functions Must Remain Accessible

7. *Navigation*

- 7.1. Provide Navigational Options
- 7.2. Differentiate and Group Navigation Elements
- 7.3. Use a Clickable 'List of Contents' on Long Pages
- 7.4. Provide Feedback on User's Location
- 7.5. Place Primary Navigation Menus in the Left Panel
- 7.6. Use Descriptive Tab Labels

- 7.7. Present Tabs Effectively
- 7.8. Keep Navigation-Only Pages Short
- 7.9. Use Appropriate Menu Types
- 7.10. Use Site Maps
- 7.11. Use 'Glosses' to Assist Navigation
- 7.12. Breadcrumb Navigation

8. *Scrolling and Paging*

- 8.1. Eliminate Horizontal Scrolling
- 8.2. Facilitate Rapid Scrolling While Reading
- 8.3. Use Scrolling Pages for Reading Comprehension
- 8.4. Use Paging Rather Than Scrolling
- 8.5. Scroll Fewer Screenfuls

9. *Headings, Titles, and Labels*

- 9.1. Use Clear Category Labels
- 9.2. Provide Descriptive Page Titles
- 9.3. Use Descriptive Headings Liberally
- 9.4. Use Unique and Descriptive Headings
- 9.5. Highlight Critical Data
- 9.6. Use Descriptive Row and Column Headings
- 9.7. Use Headings in the Appropriate HTML Order
- 9.8. Provide Users with Good Ways to Reduce Options

10. *Links*

- 10.1. Use Meaningful Link Labels
- 10.2. Link to Related Content
- 10.3. Match Link Names with Their Destination Pages
- 10.4. Avoid Misleading Cues to Click
- 10.5. Repeat Important Links
- 10.6. Use Text for Links
- 10.7. Designate Used Links
- 10.8. Provide Consistent Clickability Cues
- 10.9. Ensure that Embedded Links are Descriptive
- 10.10. Use 'Pointing-and-Clicking'
- 10.11. Use Appropriate Text Link Lengths
- 10.12. Indicate Internal vs. External Links
- 10.13. Clarify Clickable Regions of Images
- 10.14. Link to Supportive Information

11. *Text Appearance*

- 11.1. Use Black Text on Plain, High-Contrast Backgrounds
- 11.2. Format Common Items Consistently
- 11.3. Use Mixed-Case for Prose Text

- 11.4. Ensure Visual Consistency
- 11.5. Use Bold Text Sparingly
- 11.6. Use Attention-Attracting Features when Appropriate
- 11.7. Use Familiar Fonts
- 11.8. Use at Least 12-Point Font
- 11.9. Color-Coding and Instructions
- 11.10. Emphasize Importance
- 11.11. Highlighting Information

12. *Chapter 12—Lists*

- 12.1. Order Elements to Maximize User Performance
- 12.2. Place Important Items at Top of the List
- 12.3. Format Lists to Ease Scanning
- 12.4. Display Related Items in Lists
- 12.5. Introduce Each List
- 12.6. Use Static Menus
- 12.7. Start Numbered Items at One
- 12.8. Use Appropriate List Style
- 12.9. Capitalize First Letter of First Word in Lists

13. *Screen-Based Controls (Widgets)*

- 13.1. Distinguish Required and Optional Data Entry Fields
- 13.2. Label Pushbuttons Clearly
- 13.3. Label Data Entry Fields Consistently
- 13.4. Do Not Make User-Entered Codes Case Sensitive
- 13.5. Label Data Entry Fields Clearly
- 13.6. Minimize User Data Entry
- 13.7. Put Labels Close to Data Entry Fields
- 13.8. Allow Users to See Their Entered Data
- 13.9. Use Radio Buttons for Mutually Exclusive Selections
- 13.10. Use Familiar Widgets
- 13.11. Anticipate Typical User Errors
- 13.12. Partition Long Data Items
- 13.13. Use a Single Data Entry Method
- 13.14. Prioritize Pushbuttons
- 13.15. Use Check Boxes to Enable Multiple Selections
- 13.16. Label Units of Measurement
- 13.17. Do Not Limit Viewable List Box Options
- 13.18. Display Default Values
- 13.19. Place Cursor in First Data Entry Field
- 13.20. Ensure that Double-Clicking Will Not Cause Problems
- 13.21. Use Open Lists to Select One from Many
- 13.22. Use Data Entry Fields to Speed Performance
- 13.23. Use a Minimum of Two Radio Buttons

- 13.24. Provide Auto-Tabbing Functionality
- 13.25. Minimize Use of the Shift Key

14. Graphics, Images, and Multimedia

- 14.1. Use Simple Background Images
- 14.2. Label Clickable Images
- 14.3. Ensure that Images Do Not Slow Downloads
- 14.4. Use Video, Animation, and Audio Meaningfully
- 14.5. Include Logos
- 14.6. Graphics Should Not Look like Banner Ads
- 14.7. Limit Large Images Above the Fold
- 14.8. Ensure website Images Convey Intended Messages
- 14.9. Limit the Use of Images
- 14.10. Include Actual Data with Data Graphics
- 14.11. Display Monitoring Information Graphically
- 14.12. Introduce Animation
- 14.13. Emulate Real-World Objects
- 14.14. Use Thumbnail Images to Preview Larger Images
- 14.15. Use Images to Facilitate Learning
- 14.16. Using Photographs of People

15. Writing Web Content

- 15.1. Make Action Sequences Clear
- 15.2. Avoid Jargon
- 15.3. Use Familiar Words
- 15.4. Define Acronyms and Abbreviations
- 15.5. Use Abbreviations Sparingly
- 15.6. Use Mixed Case with Prose
- 15.7. Limit the Number of Words and Sentences
- 15.8. Limit Prose Text on Navigation Pages
- 15.9. Use Active Voice
- 15.10. Write Instructions in the Affirmative
- 15.11. Make First Sentences Descriptive

16. Content Organization

- 16.1. Organize Information Clearly
- 16.2. Facilitate Scanning
- 16.3. Ensure that Necessary Information is Displayed
- 16.4. Group Related Elements
- 16.5. Minimize the Number of Clicks or Pages
- 16.6. Design Quantitative Content for Quick Understanding
- 16.7. Display Only Necessary Information
- 16.8. Format Information for Multiple Audiences
- 16.9. Use Color for Grouping

17. Search

- 17.1. Ensure Usable Search Results
- 17.2. Design Search Engines to Search the Entire Site
- 17.3. Make Upper- and Lowercase Search Terms Equivalent
- 17.4. Provide a Search Option on Each Page
- 17.5. Design Search Around Users' Terms
- 17.6. Allow Simple Searches
- 17.7. Notify Users when Multiple Search Options Exist
- 17.8. Include Hints to Improve Search Performance
- 17.9. Provide Search Templates

18. Usability Testing

- 18.1. Use an Iterative Design Approach
- 18.2. Solicit Test Participants' Comments
- 18.3. Evaluate Web Sites Before and After Making Changes
- 18.4. Prioritize Tasks
- 18.5. Distinguish Between Frequency and Severity
- 18.6. Select the Right Number of Participants
- 18.7. Use the Appropriate Prototyping Technology
- 18.8. Use Inspection Evaluation Results Cautiously
- 18.9. Recognize the 'Evaluator Effect'
- 18.10. Apply Automatic Evaluation Methods
- 18.11. Use Cognitive Walkthroughs Cautiously
- 18.12. Choosing Laboratory vs. Remote Testing
- 18.13. Use Severity Ratings Cautiously

Appendix D

SUMMARY TABLE: METHODS USED TO EVALUATE A MUSEUM WEBSITE

The following table summarizes the benefits and limitations of the different evaluation methods outlined in Cunliffe et al., 2001; Harm & Schweibenz, 2001:

EVALUATION METHOD	BENEFITS	LIMITATIONS
DIRECT OBSERVATION/ USER TESTING (actual users test the usability of the web site ¹³ ; includes “think-aloud” method and Paolillo’s method)	<ul style="list-style-type: none"> • Relatively cheap and fast • Can identify usability problems with few users • Useful in identifying problems related to user needs and captures users’ subjective impressions • provides large amounts of qualitative data that shows how users use the web site • shows the reactions of actual users • identifies what users really want as opposed to what you think they want 	<ul style="list-style-type: none"> • The context, tasks, and motivation to conduct the task may be artificial; subjects might not be representative of actual users • labor intensive
LOG ANALYSIS (the collection and analysis of web access logs ¹⁴)	<ul style="list-style-type: none"> • Cost effective • Data is quick and easy to analyze • Data can be collected continuously • Captures changes in user behavior over time, what information users are accessing 	<ul style="list-style-type: none"> • It can be difficult to identify visitors and define sessions • Not always accurate at capturing data; data captured is limited (captures what the user did, but not why the user did it) • Difficult to identify usability problems
ON-LINE QUESTIONNAIRE	<ul style="list-style-type: none"> • Useful in gathering demographic, technical and visit information • Relatively inexpensive, simple, 	<ul style="list-style-type: none"> • Sample is self-selecting • Large sample size needed • Information elicited is not always reliable (i.e., they do

¹³ Harm, I. & W. Schweibenz (2001) ‘Evaluating the Usability of a Museum Website’, in D. Bearman & J. Trant (Eds.) *Museums and the Web 2001 Proceedings*. CD ROM. Archives & Museum Informatics, 2001.

<http://www.archimuse.com/mw2001/papers/schweibenz/schweibenz.html>

¹⁴ Cunliffe, D. Kritou, E. & Tudhope, D. (2001). ‘Usability evaluation for museum websites’, *Museum Management and Curatorship*, 19(3), 229-252.

	<p>and fast</p> <ul style="list-style-type: none"> • Provide useful information on actual user behavior; which can be used for the long-term development and maintenance of a site 	<p>not corroborate with users actual experiences)</p>
<p>USABILITY INSPECTION METHODS (the website is compared against a set of guidelines or heuristics¹⁴)</p>	<ul style="list-style-type: none"> • Does not require users • Considered a more rigorous method • Are often both design- and evaluation-oriented • Useful in identifying content and usability problems • Some heuristics are relatively simple and fast to use • detects usability problems that are not observed with the other evaluation methods 	<ul style="list-style-type: none"> • Expensive (if experienced evaluators are used) • Often identifies usability problems that actual users do not perceive as problematic • Some heuristics are complex and might be difficult for non-experts to use • experts can not ignore their own knowledge of the subject

Appendix E

RECOMMENDED BEST PRACTICES FOR THE DESIGN OF LESSON PLANS DERIVED FROM GYLLENHAAL ET AL. (2003)

1. Goals and Objectives for lesson plans design.

1.1. Major Goals

1.1.1. Although one goal will be to write high quality on-line lesson plans, the expectation should *not* be to have teachers use these plans “as is” in their classrooms.

1.1.2. Rather, the overall goal should be to help *teachers* write great lesson plans by providing them with resources they need in a convenient and accessible form.

1.2. More Detailed Objectives

1.2.1. **Finding from the Web.** Help teachers find lesson plans given the various ways they locate on-line resources.

1.2.2. **Navigating the site.** Make it easy for teachers to navigate to exactly the resources they need once they reach the Institute’s web site.

1.2.3. **Quality resources.** Create resources that are credible, easy for teachers to use, and will produce outcomes closely related to teachers’ own goals.

2. Design of Individual Lesson Plans

2.1. Elements Aimed Primarily at Teachers

2.1.1. **Branding.** Every page of the Web site, whether viewed on screen, printed from the Web, or downloaded as a PDF file, should display:

2.1.1.1. **Institute’s and the specific museum’s name** and home page URL

2.1.1.2. **The project’s name** and home page URL

- 2.1.1.3. **The activity or lesson plan's name** and URL
- 2.1.2. **Descriptive title.** The title should describe both the topic or subject area e.g., fish) and the primary concept or concepts taught through the activity e.g., adaptation, streamlining). Whenever possible, both the page title and the title displayed on the menu of activities should include both the topic and the concept.
- 2.1.3. **Tagline.** Include a summary phrase or sentence directly under the title. This sort of tagline will be even more important on the Web, particularly if it appears in search results and as the first phrase read by teachers after the page title.
- 2.1.4. **Grade level.** The suggested grade level should appear near the top of every lesson plan and, if possible, in both internal and external search results. When formulating grade levels, be cautious about or aware of:
- 2.1.4.1. **Overly broad** grade-level assignments—"K-8" was described as a "red flag" by some teachers.
- 2.1.4.2. **Mis-assigned** grade levels—teachers describe activities as assigned to the wrong grade level when they seem either too advanced or too simplistic for that teachers' own students.
- 2.1.4.3. **Appropriate phrasing** of the grade-level assignments (in ways that limit the possibility that teachers will take offense when the assignments don't match their perceptions of their own students).
- 2.1.4.4. **Ways to adapt activities for more or less advanced students.** Consider including ideas about how to adapt activities to different levels (teachers might revisit the lesson plan later and incorporate the different levels the second time around).
- 2.1.5. **Objectives for individual lessons.** Include short, clearly stated objectives at the beginning of every plan.
- 2.1.6. **State and national standards.** Link classroom activities, on-line activities, and other resources to **both state and national standards**. These include:
- 2.1.6.1. **Science-related standards.**

- 2.1.6.2. **Literacy standards** (especially in elementary grades).
- 2.1.6.3. **Other, non-science subject-area standards** (especially in elementary grades).
- 2.1.6.4. **Technology standards** (although this may become important to teachers a few years down the road).
- 2.1.7. **Time to complete the plan.** Include:
 - 2.1.7.1. **Time assignments** for individual activities, although be careful not to be unrealistic—seek teacher input on appropriate times for various grade levels.
 - 2.1.7.2. **Details** about advance preparation time, day of activity setup time, class time, cleanup time—and possible variations in the time for different age and ability levels—which might be included on a separate Web page linked to the short summary statement on the main activity page.
- 2.1.8. **Materials.** Include lists, being careful to formulate lists that meet the following criteria:
 - 2.1.8.1. **Complete lists.** Make sure the lists are complete—if the jars need their lids, then say so on the materials list!
 - 2.1.8.2. **Common materials.** Make sure the materials are widely known and commonly available—downstate teachers may not recognize names of Lake Michigan fish, and their local supermarkets may not carry whole ones.
- 2.1.9. **Vocabulary.** Worth including, although they won't be used by all teachers. Words could be detailed on a linked page, which might include both a word list with definitions and a word search, a crossword, or another simple activity to help students practice their new words.
- 2.1.10. **Procedure.** Describe the complete procedure on the main activity page. That's because teachers:
 - 2.1.10.1. **Skim first.** Teachers need to first skim and then study the procedure when they're deciding whether to adopt the activity or lesson.

- 2.1.10.2. **Print intact lessons.** Some teachers will want to print the page with all major features intact. They would either keep the printout at their side during the lesson (in case there were any questions they couldn't answer) or put the printout in their files to refer to whenever they did the activity again.
- 2.1.10.3. **Formats for procedure documents.** There will also be situations where it would be useful to include a detailed procedure as a separate printout—for instance, if older students will need to follow written instructions to complete an activity or lab. In this case it would seem useful to include the printout in several formats, including: **HTML** (for convenient on-line reading); **PDF** (when formatting is important); and **MS Word or RTF** (so that teachers can easily adapt the procedure to their own needs).
- 2.1.11. **Background information for teachers.** Because many teachers lack subject-area expertise, background information is an extremely vital aspect of the teacher guides. Background information should be separated from other aspects of a lesson plan—as, for instance, the hypertext equivalent of a sidebar.
- 2.1.12. **Graphics that support the lesson plan.** Consider ways to include:
- 2.1.12.1. **Diagrams** that support and explain the activities detailed in the lesson plans.
- 2.1.12.2. **Photographs** that show the “real thing,” since their students had rarely experienced the real thing firsthand.
- 2.1.12.3. **Animations** that illustrate key scientific concepts in a clear and engaging way.
- 2.1.12.4. **Interactive graphics** that students can manipulate on-screen to explore a concept in depth.
- 2.1.12.5. **Formats for display.** Some teachers will want to print graphics to show their students, or to show graphics to a large group on a screen. Therefore, consider including: **Smaller versions** of the graphics incorporated into the overall flow of the main activity or lesson plan page; **Printer-friendly versions** of the graphics linked to the main page (in several formats); and **Screen-friendly versions** of the graphics linked to the main page (either formatted for a common screen size or programmed to automatically fill a number of screen sizes).
- 2.1.13. **Handouts for students.** Develop on-line versions of data sheets and other handouts.

- 2.1.13.1. **Formats for handouts.** Because some teachers will need to modify the handouts, it would seem useful to include the printable handouts in several formats, including: **HTML** (for convenient on-line reading); **PDF** (when formatting is important); and **MS Word or RTF** (so that teachers can easily adapt the procedure to their own needs).
- 2.1.13.2. **Follow-up activities.** Consider developing short follow-up activities to print out for the students, like word searches, crossword puzzles, and so forth. (Some teachers use these sorts of activities to fill short time intervals at the end of a period or between major activities.)
- 2.1.14. **Related on-line resources for teachers.** Whenever possible, the on-line activities and lesson plans should include links to related websites with background information and related activities.
- 2.1.15. **Lists of print resources for teacher use.** Consider listing several types of print resources in the teacher section:
- 2.1.15.1. **Background information** for teachers' use.
- 2.1.15.2. **Trade books for student use**, to help teachers extend the activity for student literacy.
- 2.1.15.3. **References cited**, which may increase the credibility of the site for some secondary teachers.
- 2.1.16. **Comments from teachers who used the activity.** Consider providing the following types of information, in the teachers' own words whenever possible:
- 2.1.16.1. **Success stories.** Short descriptions of how teachers successfully adapted the activities to their own classrooms.
- 2.1.16.2. **Less successful uses of the activities.** Teachers' own descriptions of some of the problems they encountered when using the activities— and, if possible, how they solved the problems.
- 2.1.16.3. **Extensions to the activities.** Descriptions of how other teachers had gone beyond what was included in the on-line lesson plan.

2.1.17. **Technical support for teachers.** Teachers may require two types of technical support for installing and trouble-shooting plug-in programs:

2.1.17.1. **At school.** Some teachers are allowed to install plug-ins on their own, and some are required to enlist tech support staff to do the installation. Developers should consider ways to support teachers in both situations—and then do user testing of both approaches.

2.1.17.2. **At home.** Teachers accessing on-line activities from home may need to install plug-ins on their own, or with the help of their partners, friends or older children. Program developers should include clearly worded, user-tested directions and advice for installing these programs along with links to the appropriate websites.

2.2. Elements Primarily for Student Use

2.2.1. **On-line activities for student use.** When developing activities for students, remember that:

2.2.1.1. **Supplements.** At least in 2002, many teachers considered on-line activities to be supplemental to more traditional classroom lessons. They are used as introductions, follow-ups, or supplements to classroom activities.

2.2.1.2. **Older students.** At least in 2002, upper elementary and secondary teachers seemed more likely to use on-line activities with their students. High-school teachers seemed, by far, to be most comfortable with on-line activities.

2.2.1.3. **Real world data.** High school teachers, in particular, wanted real-world data for their students to analyze.

2.2.1.4. **Off-line activities.** Because classroom access to the web is still a problem in some classrooms, developers should explore the possibility of developing activities that can be downloaded and used off-line.

2.2.2. **Background information for students.** Because teachers said they had a hard time finding appropriate on-line readings for their students, consider developing readings for students at appropriate grade levels.

- 2.2.2.1. **Formats for student information.** Information could be included as **HTML** (for convenient on-line reading); **PDF** (when formatting is important in printouts); **MS Word or RTF** (so that teachers can easily adapt the readings to their own needs).
- 2.2.3. **Graphics for student use.** Developers should consider giving students direct access to the major graphics linked to the teachers' lesson plans (described above). These could be included in or linked to the background information.
- 2.2.4. **Related on-line resources for students.** Appropriate links for students could be appended to the students' background information pages.
- 2.2.5. **Lists of print resources for student use.** Lists of appropriate print resources for students could be appended to the students' background information pages. These could include:
- 2.2.5.1. **Background information** for students.
 - 2.2.5.2. **Related fiction books** for students.
 - 2.2.5.3. **References cited**, modeling good practice for older students.
- 2.2.6. **Technical support for students.** Students accessing the on-line activities from home may need to install plug-ins on their own or with the help of parents. Program developers should include clearly worded, user-tested directions and advice for installing these programs along with links to the appropriate websites.

Appendix F

TEACHERS' COMMENTS ON SMITHSONIAN LESSON PLANS

The following are a list of teachers' comments on the lesson plans posted on www.smithsonianeducation.org, compiled Summer, 2008.

Center for Folklife and Cultural Heritage – 1 comment

- *Borders/Fronteras* (Av. ☆☆☆)
 - "I use this resource with the 8th grade immigration unit. We discuss the concepts of immigration, identity, belonging and how the border can be an influential factor. I is very useful that site present cross disciplinary activities."
 - Ofelia, a Teacher, in Alexandria, VA (☆☆☆☆☆)

Cooper-Hewitt, National Design Museum – 10 comments

- *The Total Package (9-12)* (Av. ☆☆☆☆☆)
 - "While reviewing this lesson, I can also see how this impacts decisions made by businesses that want to be more environmentally friendly. The mini dump looks like a great way to demonstrate to the students the amount of waste our country is generating on a daily, weekly, or monthly basis. I plan to use this lesson in my own classroom.

Assign the students a project to contact their local landfill or recycling plant to learn about ways to recycle at their school or their community. They could also follow up with letter to their local legislature about ways the community could start recycling."

 - Phil, a Teacher, in Grove City, OH (☆☆☆☆☆)
- *Musical Math-terpiece: The Art of Piet Mondrian* (☆☆☆☆)
 - "I am big fan of Mondrian, and to come across such a lesson plan to use was a joy. I have not used the lesson plan yet but I am going to use it once I start my student teaching. My main goal was to find a plan that incorporated other subject areas such as this plan did. The activity of getting the students to not only do a Mondrian-style painting but as well to lay out a grid system on a computer program to make an artwork, in my eyes, is a wonderful step forward in integrating technology into art making. I personally went through this plan and tried it out myself and absolutely loved it. Not only do you get a feel for the original way in which Mondrian created his style on canvas, but you get to experience how you can create such works through computer graphic programs."
 - Jullian, a Student, in Tommonsville, SC (☆☆☆☆☆)

- “As a middle school math teacher, I see students all the time who don't understand the relevance of the real world or how math applies to subjects other than, well, math.

I love this lesson plan because it links math to art and music, two areas which are outside the framework of what students normally see math.

I amended this lesson plan to include other artists who used mathematical ideas in their pieces, such as Esher, DaVinci, and Pei.”

- Vanessa, a Teacher, in Lanham, MD (☆☆☆☆)

- *Candy Land* (Av. ☆☆☆☆)
 - “This project was a lot of fun for the students. It gave them the practice to draw 3 -D images and use designing techniques, and packaging and marketing ideas.”
 - Barb, a Principal, in Adams, ND (☆☆☆☆)
- *Green Stuff: Designing an Earth-Friendly Room* (Av. ☆☆☆☆)
 - “For this lesson I was really impressed with the worksheet as well as the different links that were provided. The students were able to learn along with having a ton of fun.”
 - Roberta, in Portales, NM (☆☆☆☆)
- *Smart Growth: Reshaping Communities (9-12)* (Av. ☆☆☆☆)
 - “I use the Smart Growth Unit as an Introduction to a design project that my students complete at the end of Housing and Interiors (grades 10-12 in family Consumer Science). Our town has a new senior citizen housing project which utilizes Smart Growth and Universal Design. My students measure a housing unit, draw it in a CAD program (3D Home aRchitect) and present design boards for display in the complex for the senior citizens.”
 - Deborah, a Teacher, in Morehead City, NC (☆☆☆☆)
- *Work Hard and Work Smart: Designing for Athletes (9-12)* (Av. ☆☆☆☆)
 - “The idea for this project is one that students should enjoy. Each group member should be able to find a role that they would enjoy. While the student prompt was great, the teacher materials were a bit weak. Having a rubric included, instead of suggesting that one be created by the teacher would have been more useful. Most teachers will modify any lesson plan that they find, but they would like more of a starting point. My students would laugh at me if I suggested that they use Yahoo!igans; maybe a list of websites? The design of the webpage makes reading the lesson difficult; one almost needs to print it from the beginning. I however plan on sharing this with our technology education teacher who loves to do creative projects with her students.”
 - Marge, a Librarian, in Easton, MD (☆☆☆☆)
- *An Exploration of Automotive Design* (Av. ☆☆☆☆)

- “I am a homeschool Mom and I did this lesson with my 17 year old son. It was a positive educational experience all around. We modified it somewhat to fit a homeschool setting, and it worked great. This was a great writing assignment for a young man whom is very interested in cars but not so interested in writing. It worked well.”
 - Kelly, a Parent, in Jacksonville, FL (☆☆☆☆)
- *Black, Striped, White, and Plaid: Changing Patters (PreK-3)* (Av. ☆☆☆)
 - “This was fun, especially with the first graders-what imaginations! We learned some new vocabulary with the assessment portion as well.”
 - Jennifer, a Teacher, in Starkville, MI (☆☆☆)
- *Basic Needs* (Av. ☆☆)
 - “This lesson plan is a creative way to explore past, present, and future parallels and allows students to delve back in history to see how we got where we are in our world today. Some of the resources provided (websites) were not accessible anymore which was disappointing. Also, there is no rubric or grading scale of any kind provided with the lesson plan. I wish there was a worksheet attached to supplement the lesson plan. I like the general idea of the lesson, though; targeted at the earlier grades in high school.”
 - Jessica, a Student, in Florence, So (☆☆☆)

Freer and Sackler Galleries – 2 comments

- *Gallery Guide: The Arts of Buddhism* (Av. ☆☆☆☆☆)
 - “Buddhism is a theme in Asian Art that can be traced across Asia and links both Eastern and Western art. This resource is excellent in that it provides just enough information for a general audience member to understand how Buddhism spread and how the imagery changed. Only suggestion is to add one more link to Buddhism in Korea and Southeast Asia and possibly Buddhism today.”
 - Pamela, an Administrator, in Sinking Spring, PA (☆☆☆☆☆)
- *The Arts of Japan Teachers’ Guide* (Av. ☆☆☆☆☆)
 - “Beautiful pictures and good information”
 - Judy, a Teacher, in Thomasville, GA (☆☆☆☆)

Harvard-Smithsonian Center for Astrophysics – 1 comment

- *The Annenberg/CPB Channel* (Av. ☆☆☆☆☆)
 - “Great resource sites linked with programs.

I've utilized workshops online to create a local group of teachers going through the "Primary Sources" workshop. We utilized our discussion time to discuss classroom applications and got permission to use that time outside the school day to receive PIR credit / CEUs.

The materials were excellent, well laid out and very convenient to use. The Geography and Social studies workshops are also excellent. Graduate credits are available."

- Gary, a Teacher, in Whitefish, Mo (☆☆☆☆☆)

National Air and Space Museum – 5 comments

- *Apollo to the Moon* (Av. ☆☆☆☆☆)
 - "I am going to use this resource to give my students a better understanding of the goals and challenges of the Apollo missions to the Moon. This will be used in our celebration of the 50th anniversary of NASA."
 - Steve, a Teacher, in Bradenton, FL (☆☆☆☆☆)
- *How Things Fly* (Av. ☆☆☆☆☆)
 - "Love this site."
 - Kenterra, in McComb, MS (☆☆☆☆☆)
- *Exploring Space* (Av. ☆☆☆☆☆)
 - "Pretty good resource. I will use this for my students."
 - Jolie, a Teacher, in Fredericksburg, VA (☆☆☆☆☆)
 - "Very informative."
 - Nicola, a Parent, in Scranton, PA (☆☆☆☆☆)
- *Women: National Air and Space Museum Gallery Guide* (Av. ☆☆☆☆☆)
 - "Quick reference is easy to read and understand. It lets us know exactly where in the exhibit to find info. Although I am not often able to visit the exhibit, the guides will allow my students the chance to get ideas for deeper research. Easy to use and understand."
 - Sara, a Teacher, in Hutto, TX (☆☆☆☆☆)

National Museum of African Art – 3 comments

- *The Fabric of Moroccan Life* (Av. ☆☆☆☆☆)
 - "I liked this site, however, I feel the information is a bit thin. I would like more background information on everything."

- Annette B., an Administrator, in Miami Beach, FL (☆☆☆☆☆)
- *Big/Small* (Av. ☆☆☆☆☆)
 - “This is a wonderful resource for teachers. I am currently an Art Education student and I know when I start teaching, I will be using your site often. Thank you.”
 - Robin, a Student, in Florence, SC (☆☆☆☆☆)
- *South Africa 1936-1949: Photographs by Constance Stuart Larrabee* (Av. ☆☆☆☆☆)
 - “This exhibition has some very stark and thought provoking images which make a nice addition to a PowerPoint or Picture Walk about Apartheid. I like the background on the photographer, which includes information on the portfolio exhibition that she did particularly for Paton's novel, called Go Well, My Child.”
 - Denee, a Teacher, in Orem, UT (☆☆☆☆☆)

National Museum of American History – 15 comments

- *Becoming Aware of the Japanese Internment Camp Experience* (Av. ☆☆☆☆☆)
 - “I have used this "virtual museum" about the internment camps for several years when teaching World War II. This is an excellent resource to show the Japanese experience during the war years. I show the site using a media projector. I teach 5 classes of Social Studies a year and am always amazed how each class reacts to the resources. Some classes are more interested in the propaganda. Some focus more on how the people prepared to go to the camps. Some want to study more the results of being there. These resources provide a wealth of information for these interests. We also read about the librarian that sends books and letters to children in the camps. We compare the camps to concentration and labor camps in Europe.”
 - Machele, a Teacher, in Gulf Shores, AL (☆☆☆☆☆)
 - “My 4th grade students really connected with this lesson. They began just as I expected - listing mp3 players and game systems as things that they value. As the discussion progressed, however, they began to discuss the value of pets and people.
I used this lesson as an introduction to our basal story "Baseball Saved Us" and supplemented with "The Bracelet" and "So Far From the Sea." The use of this website snagged kids like I have never seen any other year. The use of primary source docs and photos was wonderful!”
 - Marie, a Teacher, in Pueblo, CO (☆☆☆☆☆)
- *Bon Appetit! Julia Child's Kitchen at the Smithsonian* (Av. ☆☆☆☆☆)

- “I thought this was wonderful, something I can pass on to the Exhibits Coordinator at my museum. We will be having an upcoming Food Exhibit and this information will be helpful.”
 - Rebecca, in Houston, TX (☆☆☆☆☆)
- *Celia Cruz: Autobiography through Objects* (Av. ☆☆☆☆☆)
 - “I use the music clips from the website as well as the "design a performance" activity (Grades 5-8) in conjunction with the storybook "Celia Cruz, queen of Salsa" by Veronica chamber, illustrated by Julie Maren ISBN 0-14-240779-8 published by Puffin Books. Cruz's story is inspirational to young students. The Smithsonian lesson ties well to teaching about musical performance and 'stage presence'”
 - Judy, a Teacher, in Omaha, NE (☆☆☆☆☆)
- *Feeling Swing, Part 1* (Av. ☆☆☆☆☆)
 - “After reviewing this activity I was excited, knowing my students would enjoy them just as well. I am a Special Educator and with accommodations and modifications many of these activities will be useful. Aligning with VA's standards, my students will be able to engage in movement through music by various artist as well as engaging in academic studies.”
 - J., a Teacher, in Portsmouth, VA (☆☆☆☆☆)
- *History Activities: Pueblo Pots* (Av. ☆☆☆☆☆)
 - “This resource was absolutely wonderful. I am soon to be teacher in college and was trying to find some information for a lesson plan on pueblo pottery. This source not only gave me more facts to incorporate into my lesson plans, but also gave me some great ideas for activities to include for the students to participate in. I highly recommend this reading for anyone needing further information and new ideas on such subjects.”
 - Jillian, a Student, in Timmonsville, SC (☆☆☆☆☆)
- *Early Industrialization* (Av. ☆☆☆☆☆)
 - “I am a high school learning support teacher. This activity provided useful information on the early history of industrialization. I plan to use this unit to compare and contrast early industrialization with the way industry and technology have progressed and are being used today. I'm hoping to use it in a cross-curricular/whole language style unit to add to our present textbook activities. Students will be given real life activities, such as comparing a repair bill from the 1800's to a repair bill in today's society. It has been very useful in giving extra ideas to build a more interactive and realistic curriculum so that students will be able to relate how early history and inventions have affected their daily life. It made me want to update my curriculum and gave me a jump start as a teacher.”
 - Tracy, a Teacher, in Johnstown, PA (☆☆☆☆☆)

- “This was eye opening.”
- Joseph, a Teacher, in Chicago, IL (☆☆☆☆)
- *Exclusion Orders* (Av. ☆☆☆☆☆)
 - “I thought that this was a great website resource. I would use it in the classroom. The school were I am at has a smart board called a mimio board. I could display the information including the speech, collection search, resources, and reflections. This method would cut down on paper in the classroom. The students would be able to walk a mile in their shoes and gain an appreciation for their freedoms that they sometimes take for granted. This is an important lesson because it teaches the students that America had it's dark moments during the second great war. It also uses primary sources very effectively to teach the material as opposed to simply using a textbook or paper. It touches that students that learn from every type of style. It also could provoke greater depth of knowledge questions rather than simply spitting back facts. The deeper questions cause the students to gain an appreciation for the Japanese people and also for every ethnic group. It is a wonderful resource”
- Russell, a Teacher, in Southaven, MS (☆☆☆☆☆)
- *History Activities: Slave Life and the Underground Railroad* (Av. ☆☆☆☆☆)
 - “This resource will be used to help my students understand what slavery was like for those who suffered under it. I especially liked the document activity with the runaway poster. I also liked the literature connections.”
- Steve, a Teacher, in Bradenton, FL (☆☆☆☆☆)
 - “This would be a great website to use for a computer center activity when studying these themes.”
- Sharon, a Teacher, in Lawrenceville, NJ (☆☆☆☆)
- *Separate Is Not Equal: Brown v. Board of Education Classroom Activity Guide* (Av. ☆☆☆☆☆)
 - “I will use this resource! I am a student at the University.”
- Audrey, in Tempe, AZ (☆☆☆☆☆)
- *Edison Invents!* (Av. ☆☆☆☆☆)
 - “This activity is a wonderful activity that addresses the technology standard, one of the strands for light, an inquiry strand, and gives background information over a noted scientist. The article on Edison was short enough to hold students attention and contained many interesting facts as well as pictures. The light bulb activity needs more supporting materials if you are wanting a ready-made lesson (data tables, graphs, etc.). These items can be teacher or student created during the lesson. Students were excited to follow in the footsteps of Edison by creating a working bulb.”
- Marsha, a Curriculum Specialist, in Defiance, MI (☆☆☆☆☆)

- *Mirror Molecules* (Av. ☆☆☆☆)
 - “Most students & their parents shy away from chemistry because it's thought you have to be a high-level scientist! This lesson takes some of the hard edge off this mindset with fun ways to learn! Thanks.”
 - Lynne, a Teacher, in Mooreville, NC (☆☆☆☆)
- *Autobiography through Objects* (Av. ☆☆☆☆)
 - “This site is excellent. This source is so informative. Lots of activities.”
 - Dominique, a Teacher, in Desoto, TX (☆☆☆☆)

National Museum of Natural History – 27 comments

- *Food Web: Hold the Anchovies* (Av. ☆☆☆☆)
 - “A powerful lesson on a weather pattern changing event is directly related to changes in the marine food web and the impact of the food web change on people who live near the Pacific Ocean. Statements made are based upon data presented with hot links. Students are lead step by step through a process that transforms an intimidating data set into a meaningful graph. I can't believe my fortune, finding this complete lesson between my environmental science unit and my weather unit!”
 - George, a Teacher, in Spokane Valley, WA (☆☆☆☆)
- *In Search of the Giant Squid* (Av. ☆☆☆☆)
 - “The online exhibition allows the class to read, research, examine, and discover new ideas on the subject of animal environment and the oceanic community of people and animal ecosystems.

This was fascinating to this urban class of students who did not know what a squid was and how it looked.

We also learned about various products used by us on a daily basis that have an element of the OCEAN FLAVOR in them. My students and I are drawing pictures of the tanningia and the giant squid to show their difference in appearance and in size. This is great because it allows students to attach their image of the squid and the ocean environment with what they saw and what they learned from the site.

Both sites will also encourage student writings and making comparisons and contrasts.”

 - Netosh, a Teacher, in Washington, DC (☆☆☆☆)
- *Losing Ground* (Av. ☆☆☆☆)

- “Excellent resource, fast and easy to demonstrate, clear results. As a further extension (if time permits), also demonstrate using another box with grass (live grass, not clippings) since many farmers now plant certain grasses or clovers while the ground ‘rests.’”
 - Cheryl, a Teacher, in Huntington, IN (☆☆☆☆☆)
- *Striking a Balance (6-8)* (Av. ☆☆☆☆☆)
 - “Thanks”
 - Diane, a Teacher, in Cherokee, IA (☆☆☆☆☆)
 - “Good activity that includes every student being involved and able to contribute. The only problem may be the use of popcorn since my 6th graders always want to sample any food item (despite its location on the ground).”
 - Judy, a Teacher, in Brandywine, MD (☆☆☆☆☆)
- *Here Come the Sunflowers!* (Av. ☆☆☆☆☆)
 - “Overall good information about the sunflower plant.”
 - Jo Ann, a Teacher, in Mohall, ND (☆☆☆☆☆)
 - “This is a nice and simple resource to use because all the necessary information is there for you. I did not have to do any extra research on the sunflower before starting to talk to my students about the plant. It was also nice to have an activity for them to do with the same flower they planted.”
 - Heidi, a Teacher, in Fredericksburg, VA (☆☆☆☆☆)
- *Lewis & Clark: Mapping the West* (Av. ☆☆☆☆☆)
 - “This website was excellent for providing visual aids of maps to show students. We have been talking a lot about mapping the west being the reason for Lewis and Clark’s journey and it was so helpful to have some examples and interactive pieces to show the kids to keep them engaged...great website!!”
 - Michelle, a Teacher, in Blaine, WA (☆☆☆☆☆)
 - “I thought this was a very good lesson. It went nicely with our Lewis and Clark unit and the students were able to map out their route and more.”
 - Chris, a Teacher, in Bismarck, ND (☆☆☆☆☆)
- *The Dynamic Earth* (Av. ☆☆☆☆☆)
 - “This resource allowed and encouraged our sixth, seventh, and eighth grade students to grasp the overwhelmingly abstract concept of this planet’s resources, both historically and currently. From this position, they can now appreciate the need for conservation methods and improve their focus on being good stewards of this planet.”
 - Kathryn, a Teacher, in Lutz, FL (☆☆☆☆☆)

- “I work with ESL students who need visual and auditory support. In addition, the resource provides printable and downloadable materials. I will be able to create some simple centers for the students to review and practice vocabulary, concepts, and details about the solar system.”

- Beverly, a Teacher, in Hyattsville, MD (☆☆☆☆☆)

- “This is amazing! I am so excited to have found this wonderful resource. Thank you, thank you, thank you! I learned something new going through all the text, videos, and clicking on the different rock types to get a closer look.

My only criticism was that it was difficult to navigate at first. I might have preferred a larger screen, with more text per page compared with scrolling through the multiple pages for each topic and multiple sub-topics for each overarching topic. However, once I figured out all the features, it was just amazing how much was available. This is fantastic!”

- Heather, an Administrator, in Tahoe City, CA (☆☆☆☆☆)

- *Lakota Winter Counts* (Av. ☆☆☆☆☆)

- “I’m excited to use this series of activities in my ESL American Studies class next term. The primary materials are both interesting and accessible to my students, and it’s a great way to concretely personalize Native American curricula for my foreign (Japanese) students. It is also the missing link I’ve been looking for in teaching Westward Expansion.”

- Jhana, a Teacher, in Spokane, WA (☆☆☆☆☆)

- “I am planning to use this source in the future. We have completed our unit and I am researching for next year. I wish I had seen this before. I would love to do a Masters degree in using Museums and their collections for teaching.”

- Sally, a Teacher, in Hilton Head Island, SC (☆☆☆☆☆)

- *Anthropology Teaching Activities: Archeology in the Classroom* (Av. ☆☆☆☆☆)

- “This is a great lesson to use to show students how to conduct a scientific archaeological dig. Students use higher level thinking skills to analyze artifacts and evaluate information.”

- Lisa, a Teacher, in Stockbridge, GA (☆☆☆☆☆)

- *Be a Food Detective (6-8)* (Av. ☆☆☆☆☆)

- “Brings together knowledge of ingredients with knowledge of crop production in different areas!”

- Andrea, a Teacher, in Jacksonville, FL (☆☆☆☆☆)

- *Birds Bibliography* (Av. ☆☆☆☆☆)

- “Excellent resource!
Allowed us to dig deeper in a subject that we greatly enjoyed! Thank you!”

- Sherri, a Teacher, in Murrayville, GA (☆☆☆☆☆)

- *Just Passing Through* (Av. ☆☆☆☆)

- “Coming from Lake Tahoe, the topic of soil erosion and nutrient pollution is very important because of the impact on water clarity. Some interesting extensions that could be added could include how the type of soil impacts soil erosion, the type of fertilizers used, and the impacts on water pollution. To make this important topic hit home, some of the tools that soil scientists used (Munsen soil color chart, etc.) could be presented to show that there is an entire field of science dedicated to this topic. Impacts on agriculture would also be very relevant. Adding a list of web links and possible extensions would make this activity and resource more useful.”

- Heather, an Administrator, in Tahoe City, CA (☆☆☆☆)

- *Striking a Balance (9-12)* (Av. ☆☆☆☆)

- “This activity struck me as not only being possibly effective for high schoolers, but also elementary/middle if you toned it down a bit. What I especially liked was the option for change in the instant replays, asking the students to consider what they observed in previous run-throughs and to change something that would give a different result possibly that also occurs in the natural world. A very good activity to teach predation, food webs and chains, and energy transfer.”

- Marie, a Student, in Tonawanda, NY (☆☆☆☆)

- *Ocean Planet* (Av. ☆☆☆☆)

- “After reviewing the online exhibition entitled, Ocean Planet, I thought this site would be exciting for my third grade class of eager young scientists.

Although, I've never sailed nor fished, I hold great admiration for those who do! I've watched "The Perfect Storm", "Moby Dick", and "Twenty Thousand Leagues Under the Sea", as well as other film/documentaries/stories about brave fishermen. But these movies are always about modern fishermen and about "men". I was aware of the traditional Inuit and African women who hold this craft as an art form and spiritual form.

While reading the captions and information on the squid, I discovered, we really don't know much about oceanic animals as we appear to...we have a long ways to go. There have been much folklore about these ocean creatures; unfortunately the myths and tales have given them a monstrous appearance.

Thanks SI and NASA for making learning fun.”

- Netosh, a Teacher, in Washington, DC (☆☆☆☆☆)

- “This is an outstanding unit of lessons about our Ocean Planet. I have used this in college pre-service teacher prep. Students love it and find it very informational! I love it for the pictures and the activities. don't try to print it off in color from the web- you'll use a lot of orange ink!”

- Dr. Rena, a Teacher, in Atlanta, GA (☆☆☆☆)
- *Anthropology Teaching Activities: Ethical Dilemmas* (Av. ☆☆☆)
 - “The case studies were too specific. They should involve more generalized situations. Furthermore, I did a search for materials in the grades 4-8 range. This would be appropriate for high schoolers, not elementary students.”
 - Mark, a Teacher, in Comayagua, Honduras (☆)
- *Flora of Puerto Rico and the Virgin Islands: The Stahl Watercolor Collection* (Av. ☆☆☆)
 - “As a student of botanical illustration, I would prefer that the herbarium specimen or photo of the plant would be shown against the watercolor painting. I also found the site a little hard to navigate if I was unfamiliar with this type of work.”
 - Elaine, a Teacher, Pittsburgh, PA (☆☆☆)
- *Grizzly Survival* (Av. ☆☆☆)
 - “Very good.”
 - Van, a Parent, in Meadow Bridge, WV (☆☆☆)
- *Ocean Planet Lesson Plans* (Av. ☆☆)
 - “I enjoyed using this resource in class - the students were engaged and we were able to work together easily.”
 - Karen, a Teacher, Camden, NJ (☆☆☆☆☆)
- *The Food Connection* (Av. ☆)
 - “I was interested in using this with one of my classes, but the Pyramid is out-of-date.”
 - Kathy, a Teacher, in Minot, ND (☆)
 - “I don't know when this lesson plan was submitted, but changes in the food pyramid make this lesson out-of-date, at least for the diagrams.”
 - Tricia, a Librarian, in Centennial, CO (☆)

National Museum of the American Indian – 1 comment

- *Ancient Mexican Art* (Av. ☆☆☆☆☆)
 - “Nice thought of including Mexican history...”
 - Ariadna, a Teacher, in Mexico, Me (☆☆☆☆☆)

National Portrait Gallery – 6 comments

- *American Women* (Av. ☆☆☆☆☆)

- “I homeschool my 7th grade daughter, and she enjoyed the scavenger hunt style of this worksheet. It is a great celebration of women during National Women’s month. Also, we plan to visit the National Portrait Gallery next week so that she can see the works of art live and in person.”
 - Barbara, a Parent, in Woodbridge, VA (☆☆☆☆)
- *The Amistad Case* (Av. ☆☆☆☆)
 - “This is a decent summary to use in a class where you might be watching a film or staging a quick debate. It would make a nice reading comprehension activity. The language is uncomplicated and is suitable for 7th or 8th grade. However, there is a glaring omission of Roger Baldwin, the lead defense attorney.”
 - Dina, a Teacher, in Shelton, CO (☆☆☆☆)
- *Portraits of Presidents* (Av. ☆☆☆)
 - “This is a wonderful resource to include in any unit on raising awareness of Presidents. I intend to use this before the end of the year to help my 3rd graders understand the importance of researching former presidents and perhaps helping to compare/contrast formers leaders.”
 - Susan, a Teacher, in Melrose, MA (☆☆☆☆)
 - “This program is so well written and complete, you can create a full term of programs with the information. Especially useful during election and inaugural years, a wonderful way to introduce and reinforce early Presidential education.”
 - Stormy Lynn, a Curriculum Specialist, in Branson, MO (5 stars)
 - “This makes a great unit study on the presidents. I like that all the portraits are included at the end of the materials. We had a great time using the materials and making the board game.”
 - Aynsley, a Parent, in Burke, VA (☆☆☆☆)
 - “I loved the way the resource was set up, in that it allows the viewer to click on the president of choice. I teach first grade and the information given would be too advanced for my students. It would be good to have some coloring sheets, dot-to-dot, matching, masks, etc. that could be downloaded and copied. In Wash. DC where I teach, the power standard for the 3rd advisory is titled "Happy Birthday, Mr. President." Our text books contain only the basic information, so additional resources would be very beneficial. The standard for this is 1.3. Students identify the current president of the US, describe what presidents do, and explain that they are elected by the people. We are to teach to that power standard for 9 weeks, so needless to say, we need lots of activities. I found the Smithsonian website easy to navigate and very helpful and interesting.”
 - Barb, a Teacher, in Waldorf, MD (☆☆)

National Postal Museum – 4 comments

- *Postcards: The Write Stuff* (Av. ★★★★★)
 - “This activity can be integrated with any subject area. This was used with the ancient culture of Rome. Students created postcards using images from clip art and the web along with text crediting image if necessary. They "sent" their card to a friend telling of their travels within the Empire, which gave them lots of choices since the Roman Empire was so vast. Interesting images representing natural, capital and human resources came up as well as the contributions within architecture and science. Great activity. Preparation was minimal! I'm looking forward to expanding the post card concept to math (if they can tell about a concept they show they know it) and other areas not usually associated with post cards.”
 - Charlene, a Teacher, in Annandale, VA (★★★★★)
 - “Good history of the postcard. This lesson can be used in many areas. In the visual arts, I would have students to create their own postcards and not use pre-made blank cards. Who said a post card has to be rectangular? Also, it is fun to make postcards as original works of art and mail them to friends. This would be a great thing to do with a sister school.”
 - Deborah, a Teacher, in Arlington, MA (★★★★★)
- *Activity Zone* (Av. ★★★)
 - “What a great resource to build a thematic unit on mail (addressing, writing, sending letters).”
 - Stephanie, a Parent, in Thomaston, GA (★★★★★)
 - “As a reading teacher I can see great classroom potential, not so much in the game itself, but the content. Opportunities abound for lessons/discussions/writing for comprehension, the genre of biography, history, comparing and contrasting, critical thinking, and more.”
 - Dan, a Teacher, in Efland, NC (★★★★★)

National Science Resources Center – 1 comment

- *Weather* (Av. ★★★)
 - “Lots of wonderful supplies and information.”
 - Jessica, a Teacher, in Edinburg, ND (★★★)

Smithsonian American Art Museum – 3 comments

- *Campfire Stories with George Catlin: An Encounter of Two Cultures: A Guide for Teachers* (Av. ★★★★★)
 - “Excellent materials that can be adapted to grade levels 3-12. Especially good material for 5-12 Social Studies. Students may use the ideas and materials for developing Washington State's Classroom-Based Assessment projects which require students to develop an idea with artifacts, primary and secondary documents as basis for their ideas.”
 - Bonnie, in Puyallup, WA (★★★★★)
- *Save Outdoor Sculpture! Children's Page* (Av. ★★★★★)
 - “I teach special education and my students have high interest in visual and hands-on art, but don't always have the reading skills to learn about the artists.”
 - Tracy, a Teacher, in Annandale, VA (★★★★★)
- *The West as America* (Av. 4 stars)
 - “The entire lesson is well organized. Each painting allows for deep conversations about the time period. I did these lessons with my 2nd and 3rd grade class. This works really well if the Guided Language Acquisition Design strategies we use currently to assist our ELL. The questions lend themselves well to ethical questions of race.”
 - Richard, a Teacher, in San Jose, CA (★★★★★)

Smithsonian Anacostia Community Museum – 1 comment

- *Remembering Slavery* (Av. ★★★★★)
 - “I have used the WPA slave narratives in my teaching for over 20 years. The book Remembering Slavery and the web site make these narratives much more accessible for high school students. In addition, the lesson ideas and study guides accompanying the web site offer useful strategies for engaging learners with the materials.”
 - Patricia, a Teacher, in Nashville, TN (★★★★★)

Smithsonian Center for Education and Museum Studies – 33 comments

- *Art to Zoo: Dinosaurs Were Real! (1976)* (Av. ★★★★★)
 - “What a neat way to expose young children to this topic.”
 - Julie, a Teacher, in Littiz, PA (★★★★★)
- *Smithsonian in Your Classroom: The Music in Poetry* (Av. ★★★★★)
 - “I use this resource with university students enrolled in "Elementary Music for the Classroom Teacher." The students are familiar with meter in poetry --

stressed and unstressed syllables. Following the poetic patterns supplied in the Smithsonian lesson, the students write ballads about storybook characters/plots which can be then sung to the familiar tune 'Amazing Grace.'"

- Judy, a Teacher, in Omaha, NE (☆☆☆☆☆)

- *Stories of the Wrights Flight* (Av. ☆☆☆☆☆)
 - o "Great for homeschool use! With gas prices climbing ever higher it is nice that SI exhibits can be accessed and studied right from the home! The supporting lessons are perfect to check for learning and teach process as well as content!"
 - Laura, a Parent, in Partlow, VA (☆☆☆☆☆)
- *Smithsonian in Your Classroom: Introduction to the Nature Journal* (Av. ☆☆☆☆☆)
 - o "These activities not only employ the use of valuable science process skills such as observation and communication, they foster stewardship of nature and the environment. The activities are authentic and motivating, allowing for differentiation of instruction and utilization of multiple intelligences. Students were diligent in their representations, thorough, and expressive. This lesson led to student led research and the ability of all students to shine!"
 - Patricia, a Teacher, in Berlin, MD (☆☆☆☆☆)
- *Smithsonian in Your Classroom: Plants and Animals: Partners in Pollination* (Av. ☆☆☆☆☆)
 - o "I used part of this resource to integrate into a project. My 7th graders were interested and engaged once they realized their connection to pollinators. I intend on using most of the materials in my classroom next year. Well Done Smithsonian! Thank you!"
 - Traci, a Teacher, in Couperville, WA (☆☆☆☆☆)
- *Art to Zoo: Africa Behind and Beyond the Headlines (1980)* (Av. ☆☆☆☆☆)
 - o "This lesson has excellent information, well presented - students will enjoy reading about the Mali Dogon people rabbit mask - and then making their own! Mask craft is achieved using readily available items. Can be used in primary through junior high classrooms."
 - Jeanne, a Teacher, in Santa Barbara, CA (☆☆☆☆☆)
 - o "I am teaching a senior high school class regarding the impact of changes in South Africa as they pertain to the novel "Cry, The Beloved Country." I would have preferred more info. about the effect of foreign interventions in the region."
 - Chris, a Teacher, in Redwood City, CA (☆☆☆☆☆)

- “This is a great resource to use during a unit of African History and Geography. It is comprehensive and I love the map activity. It puts the continents' historical changes and struggles into perspective.”
 - Lipia, a Teacher, in Washington, DC (☆☆☆☆)
- *Smithsonian in Your Classroom: Revolutionary Money* (Av. ☆☆☆☆)
 - “This is an excellent resource to use with gifted students during a study of the Revolutionary War. The content is interesting to students who are ready to move beyond the basics and need enrichment beyond the regular curriculum.”
 - Anne, a Teacher, in Pittsburgh, PA (☆☆☆☆)
 - “The value of using Revolutionary Money in the classroom is three fold: students apply critical thinking skills, learn about primary resources, and connect ideas of propaganda during wartime. There are so many ways to use this resource that I find it's most valuable when I let the student discussion drive the learning. As students closely examine the money samples, they begin to ask questions, notice unfamiliar words and differences in monetary values. I often find that my students notice small elements that I had forgotten about from previous lessons. Students can connect their knowledge of modern money to their investigation of the samples of Revolutionary War era money. These are primary sources that students can understand more easily than digesting a letter or other document. Finally, after learning about the threats on tax collectors and the anger in the colonies during the push for independence - students are quick to see connections in the printed money. Overall, this is [... comment cuts off]”
 - Cynthia, a Teacher, in Atlanta, GA (☆☆☆☆)
- *Smithsonian in Your Classroom: World War II on the Home Front: Civic Responsibility* (Av. ☆☆☆☆)
 - “This lesson works well with our 6th grade World War II Unit. We researched online to find more posters. The students chose several posters and recreated them in Art class as large banners.”
 - Machele, a Teacher, in Gulf Shores, AL (☆☆☆☆)
 - “Excellent resource. Easy to integrate into US History course. Engaging activities.”
 - Gary, a Teacher, in Whitefish, MO (☆☆☆☆)
 - “Smithsonian in Your Classroom: World War II on the Home Front: Civic Responsibility is an exceptional resource. I shared this publication with my American History 11 students, and the colorful posters and interesting information captured the attention of class members. The content definitely enhanced our study of World War II.”
 - Cindy, a Teacher, in Sylacauga, AL (☆☆☆☆)

- “Easy to use resource in US History, American Government or Language Arts Class. Very flexible resources lend themselves to various educational standards.”
- Gary, a Teacher, in Whitefish, MO (☆☆☆☆☆)
- “The posters and lessons in this unit were very helpful as an introduction to visual primary sources with 5th graders. Students were drawn to the images and were able to discuss the author, audience and purpose for the posters. We also discussed whether they thought they would be effective today.”
- Paula, a Librarian, in Seattle, WA (☆☆☆☆☆)
- “I used this resource embedded in my powerpoint on World War II propaganda. The students reacted very well to the clarity and dramatic elements of the pieces. We used them as inspiration for our own propaganda pieces as part of a culminating project on World War II and its effect on the homefront.”
- Shannon, a Teacher, in Richmond, VA (☆☆☆☆☆)
- *Smithsonian in Your Classroom: Letters from the Japanese American Internment* (Av. ☆☆☆☆☆)
 - “Fantastic hands on resource! I used the "Letters from a Japanese Internment Camp" while teaching Farewell to Manzanar. The resource gave the book depth and validity. Thank you!”
- Amanda, a Teacher, in Fort Wayne, IN (☆☆☆☆☆)
 - “The WWII internment camps are an unspoken part of US history for many students. When I discuss Elie Wiesel and his memoir with my students, I also ask them what they know about the camps in the US. Few have heard of them. This resource makes this come alive and becomes both a reading and writing lesson for them. Assignments include writing their own letters in the voice of the students and writing editorials about this shameful time in our history.”
- Sue, a Teacher, in Spotsylvania, VA (☆☆☆☆☆)
 - “I would love to learn more things about art.”
- Sarah, a Student, in Reading, PA (☆☆☆☆)
- *Apollo 11: Walking on the Moon* (Av. ☆☆☆☆☆)
 - “What a fun resource! Great activities for kids with bright colors!”
- Sharon, in Washington, DC (☆☆☆☆☆)
 - “Highly recommended for students of all ages. Great science and fun.”
- Tom, an Administrator, in Edinboro, PA (☆☆☆☆☆)
- *Art to Zoo: Fossils: Footprints Across Time (1984)* (Av. ☆☆☆☆☆)
 - “The breakdown of this resource was very helpful. We really enjoyed the experiments making fossils. I personally found it fascinating with the time lines.

Also what to look for when exploring for fossils. A good point to remember its OK to look touch and explore but remember to put back so others can enjoy.”

- Nancy, a Teacher, in Gainesville, FL (☆☆☆☆)

- *Art to Zoo: Nineteenth-Century Family Portraits: Looking into Home, Sweet Home* (Av. ☆☆☆☆)
 - “This lesson gave good suggestions for learning about our past from photos. The historical information was interesting, but used some broad generalizations. Useful resource.”
 - Tena, a Teacher, in Siloam Springs, AR (☆☆☆☆)
- *My Wonderful World* (Av. ☆☆☆☆)
 - “really good videos/pictures on this web site!! Gives the students a chance to visualize the culture along the silk road and to see how one interacted with the other.”
 - Luis, a Teacher, in Montgomery Village, MD (☆☆☆☆)
- *Collecting Their Thoughts: Explaining How Things Work* (Av. ☆☆☆☆)
 - “Excellent”
 - Carmen, a Teacher, in Toa Baja, PR (☆☆☆☆)
- *Collecting Their Thoughts: Conversing with an Object* (Av. ☆☆☆☆)
 - “I used this as a journal activity while we reviewed the punctuation rules for dialogue. However, I modified the lesson so students had to write from the point of view of 2 objects that were next to each other on the Smithsonian's HistoryWired website: <http://historywired.si.edu/index.html> (However, I didn't allow them to write from the point of view of the Playboy bunny outfit!)

The students had fun choosing objects and getting into persona. It was a much more interesting way to reinforce punctuation rules than standard worksheets.”

 - Kristin, a Teacher, in Herndon, VA (☆☆☆☆)
 - “Extraordinary: image and sculpture”
 - El moukhtan, a Student, in Safi, Mo (☆☆☆☆)
- *Smithsonian in Your Classroom: Minerals, Crystals, and Gems: Stepping-Stones to Inquiry* (Av. ☆☆☆)
 - “Thank you so much Smithsonian for creating this lesson! Being so close to the Natural History Museum allowed me to take my students into DC and enrich their learning of Rocks, Minerals and the Rock cycle with these excellent lessons that we were able to use before, during and after our trip to the exhibit! Thanks again!”
 - Jeryl, a Teacher, in Alexandria, VA (☆☆☆☆)

- “I really enjoyed the information and user-friendliness of this website, and found it to be a useful resource for myself. I do think it would be a lot for one of my students (I work in an ED center) to use though, without careful planning and guiding. All around, beautifully done and informative!”
- Kelley, a Teacher, in Washington, DC (☆☆☆)
- *Art to Zoo: A Mouse Like a House? A Pocket Elephant?: How Size Shapes Animals, and What the Limits Are (1987)* (Av. ☆☆☆)
 - “Loved this lesson. Very hands on, and a great lesson to activate students prior knowledge. I like the fact that I was able to modify it for the ESL students in the classroom. It was also wonderful that the chart comes in Spanish.”
- Sarah, a Teacher, in San Antonio, TX (☆☆☆☆)
 - “We had fun studying animals & their habitats and this provided an extension to what we were studying as to why animals are designed the way they are.”
- Jamie, a Teacher, in Whitefish, MO (☆☆☆☆)
- *Smithsonian in Your Classroom: Decoding the Past: The Work of Archaeologists* (Av. ☆☆☆)
 - “I have used lesson plan #3 of this resource for several years now. My students love to discover what the "found" objects really are. Each time they are astounding to find that they are simple everyday items.”
- Jennifer, a Teacher, in Stonewall, MS (☆☆☆☆☆)
- *Smithsonian in Your Classroom: What is Currency? Lessons from Historic Africa* (Av. ☆☆☆)
 - “It would be an interesting way to expand a lesson on economics using some critical thinking skills.”
- Sharon, a Teacher, in Lawrenceville, NJ (☆☆☆☆)
- *Art to Zoo: Airplanes and Airports: How to Take Off Without Ever Leaving the Ground (1982)* (Av. ☆☆☆)
 - “I found this to be fairly accurate, yet quite outdated. While many of the facts were true, much was not even mentioned, such as all of General Aviation and the role it plays in society. Visits to airports did not include many of the opportunities found at smaller, non-commercial airports. I probably would not use this particular resource, although I will definitely continue searching and find the website quite beneficial.”
- Patricia, a Teacher, in Cupertino, CA (☆☆☆)
- *Smithsonian in Your Classroom: Under the Spell of Spiders* (Av. ☆☆☆)
 - “While this is all interesting information, it is very small print and hard to read.”
- Summer, a Teacher, in Maineville, OH (☆☆☆)

Smithsonian Institution Archives – 1 comment

- *Smithsonian Scrapbook: Letters, Diaries & Photographs from the Smithsonian Archives* (Av. ☆☆☆☆)
 - “Very helpful!”
 - Jim, a Teacher, in Washington, DC (☆☆☆)

Smithsonian Institution Libraries – 4 comments

- *Measurement via Triangulation* (Av. ☆☆☆☆)
 - “After going through a trig section with my geometry students, this activity provided great insight on how we can use trig outside of pure theory.”
 - James, a Teacher, in Arlington, VA (☆☆☆☆)
 - “I used this activity with my 5th graders after studying the area of triangles. I was a great extension and a nice application to give them a real world experience.”
 - Cheryl, a Teacher, in Warner Robins, GA (☆☆☆☆)
- *Using Means, Medians, and Modes* (Av. ☆☆☆☆)
 - “My students were very engaged with the height information. I also had students find the height of famous athletes at age 13 to add into the mix.”
 - Sandra, a Teacher, in Huntsville, TX (☆☆☆☆)
- *Collecting and Using Data* (Av. ☆☆☆☆)
 - “I am always looking for different websites for data that can be used for graphs and the websites listed are great resources”
 - Julie, a Teacher, in Mohall, ND (☆☆☆☆)

Smithsonian Institution Traveling Exhibition Service – 3 comments

- *Corridos sin Fronteras* (Av. ☆☆☆☆☆)
 - “I always use this with my Latin American History class (10-12 grade). It's great because it exposes students to Mexican music & culture and many Corridos relate to history. My favorite is the "Punative Expedition," which is the Mexican take on the Mexican Revolution: Pancho Villa as a hero who embarrasses the US. What's neat is that I actually remember my Latin American History teacher in college playing this song for the class and we had to analyze it as a source. It's also great for students whose main language is Spanish because they can view the website in Spanish!”
 - Lauren, a Teacher, in Wheaton, MD (☆☆☆☆☆)
- *Holding Out for A Hero and Exhilarating Exhibits* (Av. ☆☆☆)

- “This is a really cool web site.”
- Kera, a Student, in Marlow, OK (☆☆☆☆☆)
- *Batting Practice and Poetry in Motion* (Av. ☆☆☆)
 - “This is a great idea. I am always looking for ways to make connections that engage my students. This can be modified to include many athletes, role models, etc. I plan to use this in my biography unit!”
- Pat, a Teacher, in Stroudsburg, PA (☆☆☆☆)

Smithsonian Latino Center – 3 comments

- *Andean Rhythms: A Children’s Workshop* (Av. ☆☆☆☆☆)
 - “This resource is great for music and art related projects in class or over the summer. My class attended the music workshop and some students played with the artists, it was awesome!!”
- Ofelia, a Teacher, in Alexandria, VA (☆☆☆☆☆)
 - “For the first time in 10 years, I found myself having to teach music to 2nd graders. This lesson met the CA 2nd grade frameworks and it helped my students understand more about the woodwinds family. They were also happy to create an inexpensive instrument of their own. Many of my students are on Hispanic heritage so this was something that they could relate to, Most of all it helped a non music teacher have a great resource.”
- Beth, a Teacher, in Hayward, CA (☆☆☆☆☆)
 - “I was very excited to see this resource in both English and Spanish. I will be incorporating this information into a summer rhythm and percussion workshop for children. I know parents will be impressed that their children will receive this information and appreciate the structure in which it is presented. Thank you for this valuable resource for educators!”
- Marianne, a Teacher, in Petaluma, CA (☆☆☆☆☆)

National Zoological Park – 8 comments

- *Beaver Valley Trivia Game* (Av. ☆☆☆☆☆)
 - “Third graders love animals and would be engaged in this activity. Could be used individually or in partners. Nice activity.”
- Susan, a Teacher, in Melrose, MA (☆☆☆☆☆)
- *Eat Like a Bird Exhibit Program* (Av. ☆☆☆☆☆)

- “THE EAT LIKE A BIRD EXHIBIT PROGRAM WILL BE A WONDERFUL EXPERIENCE FOR ANY CHILD. THE OPPORTUNITIES TO EXPLORE AND LEARN ARE INVALUABLE. LEARNING HOW DIFFERENT BIRDS ADAPT TO EATING VARIOUS FOODS AND OBSERVEING FEEDING DEMONSTRATIONS WILL PROVE TO BE A TRIP THAT STUDENTS WILL ALWAYS REMEMBER. THE STATE STANDARDS AND THE BIRD PROGRAM APPEAR TO ALIGN. THE QUESTION IS, “WILL THERE BE CHILDREN WHO CAN NOT AFFORD THIS TRIP?” THE COST IS BEYOND SOME CHILDREN IN OUR BORDERS. PAYING \$20 WILL EXCLUDE MANY CHILDREN. SOME TEACHERS WILL BE FORCED TO FIND LESS EXPENSIVE TRIPS.”
 - Kim, a Teach, in Kansas City, MO (☆☆☆☆☆)
- *Migratory Birds Coloring Pages* (Av. ☆☆☆☆☆)
 - “Learning about the birds and their migration patterns is really a lesson for me. Being a forest manager, keen on birds, gave insight to me.”
 - Manjunatha, an Administrator, in Gangtok, Si (☆☆☆☆☆)
 - “Really wonderful site. I can't wait to use the online coloring pages with my students! Very informative and interactive site.”
 - Dana, a Teacher, in Crofton, MD (☆☆☆☆☆)
 - “In-depth material for a young age group that reinforces with great activities. The coloring pictures are detailed. The entire lesson is interesting.”
 - Jenn, a Parent, in Corpus Christi, TX (☆☆☆☆☆)
 - “I love when simple activities can be accompanied by great discussions. Also the drawings are beautiful and detailed. Thanks!”
 - Amy, a Curriculum Specialist, in Aurora CO (☆☆☆☆☆)
- *Conservation and Science of North American Animals* (Av. ☆☆☆☆☆)
 - “Introducing elementary students to the reintroduction of wolves to forests is a fun topic to cover. This resources helps to do that by giving both sides of the topic so that students can understand the issues from both perspectives.”
 - Susan, a Teacher, in Melrose, MA (☆☆☆☆☆)
- *Giant Panda Curriculum Guide* (Av. ☆☆☆)
 - “As a certified teacher, now homeschooling my third grade son, I was excited to share this amazing study with him! Being half Chinese, my son was very interested in the Giant Panda. This curriculum did not disappoint us! The information and photos were informative, and also a treat to see! Learning the biology of the Giant Panda was of great interest to my son as well- he now wants to take a trip to see them in person at the zoo! He is already an advocate for conservation and endangered animals, and this lesson only furthered his fervor for the subject! This material was a giant success for us!”
 - Alissa, a Teacher, in Clermont, FL (☆☆☆☆☆)

Appendix G

TEACHERS' NIGHT FOCUS GROUP TEMPLATE – LESSON PLANS

Introduction/Warm-up

Welcome everyone! My name is Pino Monaco and this is Jennie Ito. We are from the Smithsonian Center for Education and Museum Studies. Thank you for agreeing to be a part of this focus group.

Purpose of the Focus Groups

Over the next two weeks, we are doing a number of focus groups with educators just like you who attended Teachers' Night 2008. The reason we are having these focus groups is to better understand how educators use the materials distributed at our annual Teachers' Night. Your input is very valuable and will help us improve this special event!

For those of you who are participating in a focus group for the first time, a focus group is an informal, friendly discussion. Our job is simply to facilitate the conversation. Every person's experiences and opinions are important, and there are no right or wrong answers. To ensure that everyone feels comfortable, please be respectful to others when they are speaking.

We will be tape recording the discussion, but the recording will only be used by us to analyze and summarize what all the focus groups are telling us. We will not identify anyone by name so your comments are confidential. Participation is completely voluntary so you are free to leave at any point if you change your mind about participating. Are there any questions?

Collecting the Entrance Narrative

We would like to begin by going around the table and asking you to introduce yourself.

Please tell us your first name, and what grade and subject you teach.

Let's start by discussing what you like most about your job and what you feel is the biggest challenge you face as an educator. Who would like to start?

Thank you. Now we would like to hear about your relationship with the Smithsonian. What does the Smithsonian mean to you?

As an educator, HOW have you used the Smithsonian in the past?

Teachers' Night Materials

Now we would like to discuss your experiences with Teachers' Night 2008. Specifically, we are interested in learning how you used the material you collected during Teachers' Night. We realize that you collected a lot of material but we are going to focus on a few specific items.

SHOW the items

Smithsonian Center for Education and Museum Studies – Smithsonian in Your Classroom

National Science Resource Center – Teacher’s Guide

1. How did you use this material?
2. Why did you use the material?
3. Have you seen or used materials like this before (pre-packed, lesson plans)?
4. What were you looking for?
5. Did you find what you were looking for?
6. How did this material meet your needs as an educator?
7. Now, think back to the beginning of the focus group when you described the biggest challenge you face as an educator. Did this material help you address the challenge you described? Please, elaborate.
8. How has this material helped you incorporate the Smithsonian Institution into your classroom?
9. Would you be interested in more information on *these types* of lesson plans?
10. How can this material be improved to better meet your needs?

Wrap up

Any other comments or specific suggestions on what we could include in the materials distributed at Teachers’ Night to make them more useful for teachers?

References

- Bordac, S., Brucken, C., Blanshay, L., Geft, L., & Samuels, E. (2003) 'Developing Online Teachers' Resources at the Museum of Tolerance: A Case Study in Innovation and Evolution' in D. Bearman & J. Trant (eds) *Museums and the Web 2003 Proceedings*. [CD ROM]. Archives & Museum Informatics, 2003. [2008, November 12] <http://www.archimuse.com/mw2003/papers/bordac/bordac.html>
- Borland, C. (1997) 'ArtsEdNet: Assessing an arts education website' in D. Bearman & J. Trant (eds) *Museums and the Web 1997 Proceedings*. [CD ROM]. Archives & Museum Informatics, 1997. [2008, November 12]. <http://www.archimuse.com/mw97/speak/borland.htm>
- Buffington, M. (2007, May) 'How do Teachers and Students Use Museum Websites?' Talk presented at the American Association of Museums Annual Meeting, Chicago, IL.
- Cunliffe, D. Kritou, E. & Tudhope, D. (2001). 'Usability evaluation for museum websites', *Museum Management and Curatorship*, 19
- Gyllenhaal, E. D., & Schaefer, J. (2002) 'Front-end evaluation of the On-line Teacher Resources project: Final report', unpublished manuscript, John G. Shedd Aquarium, Chicago, IL. <http://selindaresearch.com/SheddOnlineTeacherResourcesFront-End.pdf>
- Gyllenhaal, E. D., Beaumont, L., & Tyree, A. (2003) 'Formative evaluation of the On-line Teacher Resources Project: Final report', unpublished manuscript, John G. Shedd Aquarium, Chicago, IL. <http://www.selindaresearch.com/SheddOnlineTeacherResourcesFormative.pdf>
- Harm, I. & W. Schweibenz (2001) 'Evaluating the Usability of a Museum Website' in D. Bearman & J. Trant (eds) *Museums and the Web 2001 Proceedings*. CD ROM. Archives & Museum Informatics, 2001. <http://www.archimuse.com/mw2001/papers/schweibenz/schweibenz.html>
- Keevil, B. (1998) 'Measuring the usability index of your website', paper presented at the annual Special Interest Group on Systems Documentation, Quebec City, Quebec.
- Koyani, S. J., Bailey, R. W., & Nall, J. R. (2003) *Research-based web design & usability guidelines*. Washington, D.C.: United States Department of Health and Human Services. <http://www.usability.gov/pdfs/guidelines.html>
- Marty, P. & Twidale, M. (2004) 'Lost in gallery space: A conceptual framework for analyzing the usability flaws of museum websites', *First Monday*, 9(9). Retrieved November 3, 2008, from http://www.firstmonday.org/ISSUES/issue9_9/marty/

Molich, R., and Nielsen, J. (1990) 'Improving a human-computer dialogue', *Communications of the ACM*, 33(3), 338-348.

Rockman, S. (2005) 'Assessing the outcomes of interactive websites' in *Proceedings of Web Designs for Interactive Learning Conference, Website evaluation* (pp 2-11) Ithaca, NY: Cornell Lab of Ornithology and The Exploratorium.
http://www.rockman.com/publications/articles/Assessing_the_Outcomes.pdf

Wetterlund, K. (May, 2007) 'How do Teachers and Students Use Museum Websites?' Talk presented at the American Association of Museums Annual Meeting, Chicago, IL.