KQED *QUEST*

Final Evaluation Report

Rockman et al
Independent · Insightful · Informative

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Executive Summary

KQED's *QUEST* is a multi-year, multiple-media project seeking to influence the Bay Area's discussions about and activities related to science, the environment, and nature, with a particularly local focus. Rockman et al (REA), a San Francisco-based research and evaluation organization, conducted an evaluation of *QUEST* programming and activities over the course of several years. The evaluation examined general *QUEST* audiences, formal and informal educators' use of *QUEST*, and KQED's development and maintenance of a partnership among a number of Bay Area science and environmental organizations. The results of REA's evaluation activities are presented here in a series of five reports for general audiences, educators, and partners.

Overall Evaluation

Over the course of three years, this evaluation discovered that KQED *QUEST* successfully serves a wide variety of audiences with different backgrounds, needs and interests. Across these diverse groups, a number of common interests emerged, such as: environmental issues, local concerns and organizations, high quality content, and current science information. During the grant period, the *QUEST* Interactive team expanded its web presence, offering the expanding online audiences new ways to interact with the content while simultaneously producing content for radio and television broadcast. The Education staff spread both *QUEST* content and digital media technology skills to science educators and students throughout the Bay Area. Throughout the process, the *QUEST* team has taken information gleaned from evaluation and implemented changes and enhancements – from mid-session tweaks to educator workshops to the adjustment of partner relationships and participation.

General Audiences

In Year 1, REA administered two audience surveys to gather baseline, current participation, and media use information from KQED audience members. To further understand audience members' engagement with and interest in science, environmental, and nature activities over time, REA recruited a subset of respondents from the Year 1 surveys to participate in a longitudinal audience panel over the course of six months in Year 2. In Year 3, the evaluation shifted to the growing number of audience members accessing and using *QUEST*'s online content and resources. The data from the KQED *QUEST* Online Audience Survey found in the Online Audience Report complements the picture of KQED audiences' interests in and interactions with science gathered in prior years of the evaluation.

Who are Online Audiences?
The majority of Online Audience members (69%) live in the Bay Area. They represent a broad range of ages (50-50 split, 18-44 and 45-65+) and a good gender mix (M=59%,

W=41%). These online audience members tend to be well educated; thirty percent have a Master's or professional degree.

How do Online Audiences interact with new media?
These online audience members differ quite a bit from the KQED general audience in their use of new media. While the majority of general audience members surveyed in Year 2 were not using new media, most of these Online Audience members reported using a wide variety of new media technologies and engaging in Web 2.0 activities. Moreover, their attitudes toward these technologies were quite positive.

How do Online Audiences interact with QUEST online?
Like the general KQED audience members, Online Audience members seek out *QUEST* content because they appreciate the uniqueness and quality of the content. They access this content online for convenience, and nearly one quarter visit the site a few times a week or more. When there, they are far more likely to seek out video pieces than any other content types.

Educators

The goals of the educator evaluation were twofold: to gather rich data regarding how educators implemented what they learned in a variety of KQED *QUEST* training workshops and outreach activities and to gather preliminary data on the impact *QUEST* educational activities have had on teaching and learning. To do so, REA employed a mixed-method evaluation approach that included observations of *QUEST* workshops, pre- and post-workshop educator surveys online surveys, and a series of in-depth case studies. Year 3 specifically focused on (a) an understanding of educators accessing QUEST's online content and resources, (b) the 2008-2009 *QUEST* Science Education Institute, and (c) real-world applications of *QUEST* content and digital media technologies. This summation report includes separate reports for each of these areas.

Who are Online Educators?
More than half of Online Educators teach high school students (59.5%) in public schools (56.8%), and between 40 and 50% teach science courses. Online Educators tend to be mid-career: 35.1% had been teaching for 4-9 years and 45.9% for 10 or more. Approximately three-quarters (73%) of the respondents are women (median age range 45-54), and over two-thirds (67.6%) live in Bay Area. A majority (53%) have attended some form of technology training/professional development, including 36% who attended a KQED training.

How do Online Educators interact with new media?
Like the general Online Audience members, these Educators use a wide variety of new media technologies and express extremely positive attitudes toward them. As Tables 1 and 2 below show, most Online Educators report accessing music/radio and TV online between a few times a month and a few times a week, 60% have created web pages, and nearly three-fourths have shared something they created with others online.

How do Online Educators interact with QUEST?
A number of Online Educators indicated that they regularly check the *QUEST* site for new content. Further, while one-fifth have not used QUEST with their students, more than 1/3 do so *at least* a few times a month. When Online Educators do use QUEST with students, they are most likely to use video segments (62.2%), followed by Educator Guides (45.9%). Online Educators find *short, stand-alone video segments featuring cutting-edge content with associated educator guides* the most useful.

Science Education Institute Key Findings

- Program Educators felt that both their ability to use new media and knowledge of 21st Century skills increased as a result of their participation.

- Nearly all participants shared their newfound knowledge with their colleagues.

- As a result of participation, Program Educators reported increases in the use of a wide variety of digital media and *QUEST* resources with their students.

- Most participants felt that new media and *QUEST* content engaged their students and that using these resources added value to their classrooms.

Partners

KQED/*QUEST* staff initially focused on the development of the partnerships. Incorporating feedback from partner members gleaned through the evaluation, both KQED/QUEST staff and the partners themselves took a number of noteworthy steps to strengthen and reshape organizational relationships, processes, and collaborative program activities. As a result of focused, proactive outreach by *QUEST* staff, partners adopted a much more positive and collaborative project mindset. *QUEST* partner meetings became venues for learning new media skills and initiating new projects with QUEST and other partners. With a strong and working partnership model in place, the partner evaluation for Year 3 shifted to how member organizations were implementing the media and technology skills learned in partner workshops.

Workshop participants gained both new skills and ideas for how to implement new media technologies on their organization's websites. Partners appreciated the sharing of ideas and the time for hands-on practice, which gave many the confidence to implement what they learned. Many organizations did add widgets and Google maps to their sites after the workshops. Ultimately, the partners looked forward to additional training sessions.

KQED *QUEST* Online Audiences
Evaluation Report

Introduction and Background

In Year 1, REA administered two audience surveys to gather baseline, current participation, and media use information from KQED audience members. To further understand audience members' engagement with and interest in science, environmental, and nature activities over time, REA recruited a subset of respondents from the Year 1 surveys to participate in a longitudinal audience panel over the course of six months in Year 2. In Year 3, the evaluation shifted to a survey of the growing number[1] of audience members accessing and using *QUEST*'s online content and resources. The data from the KQED *QUEST* Online Audience Survey complements the picture of KQED audiences' interests in and interactions with science gathered in prior years of the evaluation.

Table 1
Where Online Audiences Found Survey Link

Location of Survey Link	%
KQED Web link	*62.0*
General KQED page	16.3
KQED Education page	2.5
KQED Science Education page	3.8
QUEST page	40.0
KQED Communication	*20.0*
QUEST Newsletter	11.3
KQED Science Twitter	8.8
QUEST Secondary Source	*5.0*
QUEST on YouTube	2.5
QUEST on iTunesU	2.5
Other Source	*13.0*
Colleague/Friend	2.5
Non-KQED site	10.0

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[1] As of October 2009, the Web site receives approximately 55,000 visits per month. Users access *QUEST* audio and video content online an average of 100,000 times per month (a figure that can range from 50,000 one month to 500,000 another).

This survey was made available to online users at two points – January 26-February 24, 2009 and August 10-September 15, 2009 – during Year 3 of the evaluation. A total of 80 Online Audience members responded to the survey. Links to the survey were posted on a number of KQED and *QUEST* web pages as well as sent out via newsletter and Twitter. As Table 1 indicates, nearly two-thirds of Online Audience respondents were visiting a KQED Web page when they found the survey link, and 40% of those respondents were visiting *QUEST*.

The 10% who came to the survey from non-KQED sites indicated they were linked to *QUEST* from places such as the California Academy of Sciences Nightlife page, Pine Street Foundation, the Center for Whale Research, and one from a Norwegian site called Naturfag, which has embedded and linked to the *QUEST Nanotechnology Takes Off* video.

The goal of the surveys was to gain information regarding the ways in which Online Audiences access and use *QUEST*, as well as their interests in and attitudes toward digital media. The sections present this information, contextualized by information about general KQED audiences and digital media use by the American public.

Who are they?

As Figures 1 and 2 show, the majority of Online Audience members (69%) live in the Bay Area. They represent a broad range of ages (50-50 split, 18-44 and 45-65+) and a good gender mix (M=59%, W=41%). These online audience members tend to be well-educated; thirty percent have a Master's or professional degree.

Figure 1
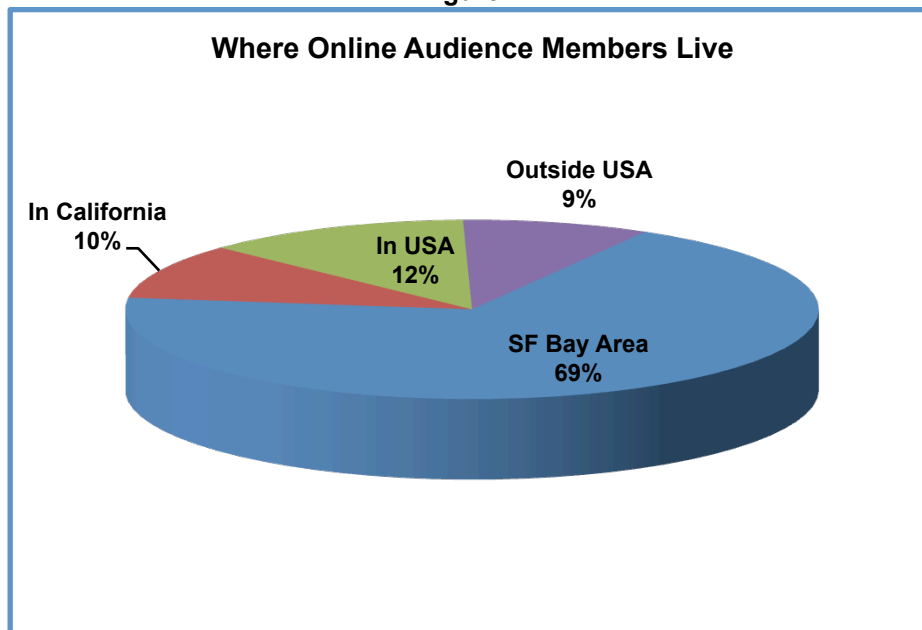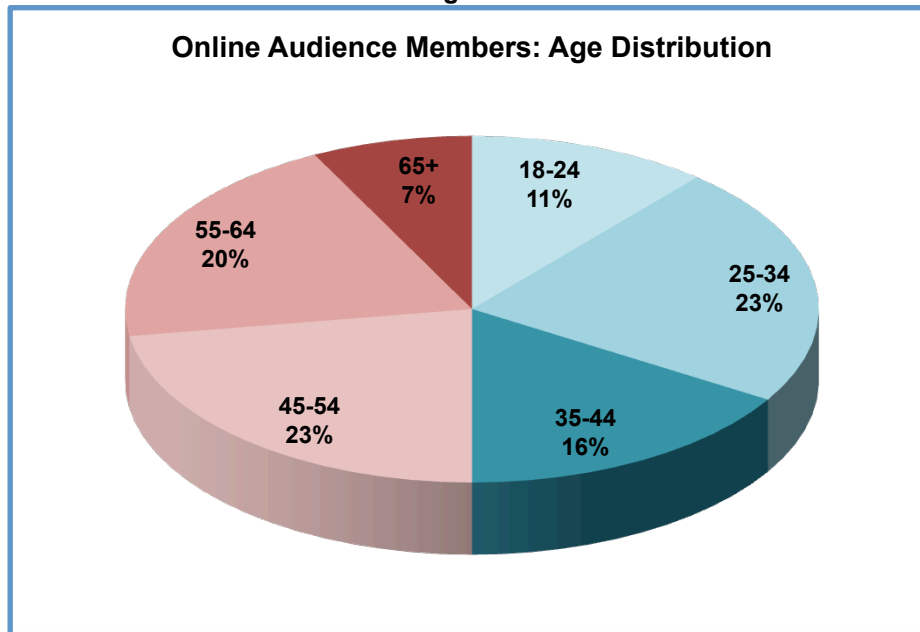
Where Online Audience Members Live

Outside USA 9%

In California 10%

In USA 12%

SF Bay Area 69%

Figure 2

Online Audience Members: Age Distribution

How do they interact with new media?

These online audience members differ quite a bit from the KQED general audience in their use of new media. While the majority of general audience members surveyed in Year 2 were not using new media, most of these Online Audience members reported using a wide variety of new media technologies and engaging in Web 2.0 activities. Moreover, their attitudes toward these technologies were quite positive.

The Online Audience Survey asked respondents about their use of a number of digital media. These questions were adapted from the Pew Internet and American Life Project surveys[2], an initiative that studies the role of the Internet in people's lives. Table 2 below presents the results from this *QUEST* survey alongside Pew data from 2007 (the most recent available for these items).

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[2] Please note that the Pew information is presented for comparison purposes, only. Methods of survey distribution, types and numbers of respondents, and the dates on the surveys varied greatly. The *QUEST* survey had a small and narrow distribution with a total of 80 respondents. The Pew surveys gather information from a large, representative sample of the U.S. adult population, and their results are generalizeable. A summary of Pew's media use trends can be found at <http://www.pewinternet.org/Trend-Data/Online-Activites-Total.aspx>.

Table 2
Engagement in New Media Activities Compared to Pew Survey Data

New Media Activity	QUEST Audiences		Pew 2007
	Daily	At All	(At All)
Download Music	19.0%	89.9%	37.0%
Online/Alt TV	19.0%	89.9%	20.0%
Online Music/Radio	34.2%	93.7%	31.0%
Share creation online	n/a	63.8%	21.0%
Post comments	n/a	76.3%	22.0%
Create own webpage	n/a	53.8%	14.0%
Create webpage for others	n/a	38.8%	13.0%
Remixed material	n/a	31.3%	11.0%

This comparison indicates that the *QUEST* Online Audience members differ not only from general KQED audiences but also from the general U.S. population in their new media use. The vast majority of *QUEST* Online Audience members have downloaded music and watched and listened to media through online and new media sources. In fact, the percentage of *QUEST* Online Audience members who reported accessing audio and video content online *daily* is approximately the same as the percentage of the Pew survey respondents who reported having done so *ever*. Online Audience members are also far more likely than the Pew general respondents to have engaged in sharing and creating their own content online: more than half have created their own web pages.

In *A Typology of Information and Communication Technology Users[3]*, Pew has used their database of media use to profile a number of new media user categories. The *QUEST* Online Audience best fits with Pew's "Elite Tech User," in which Pew places approximately 31% of American adults. These individuals are the most active new media users, described in the report as follows:

> The **elite users** of ICTs [Information and Communication Technologies] consist of
> four groups that have the most information technology, are heavy and frequent
> users of the internet and cell phones and, to varying degrees, are engaged with user-

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[3] Horrigan, John B. *A Typology of Information and Communication Technology Users.* Washington, DC: Pew Internet & American Life Project, April 2007. http://www.pewinternet.org/Reports/2007/A-Typology-of-Information-and-Communication-Technology-Users.aspx, accessed on October 7, 2009.

generated content. Members of these groups have generally high levels of satisfaction about the role of ICTs in their lives, but the groups differ on whether the extra availability is a good thing or not.

Like most Elite Users, *QUEST* Online Audiences hold quite positive attitudes toward those media, as presented in Figure 3.

Figure 3
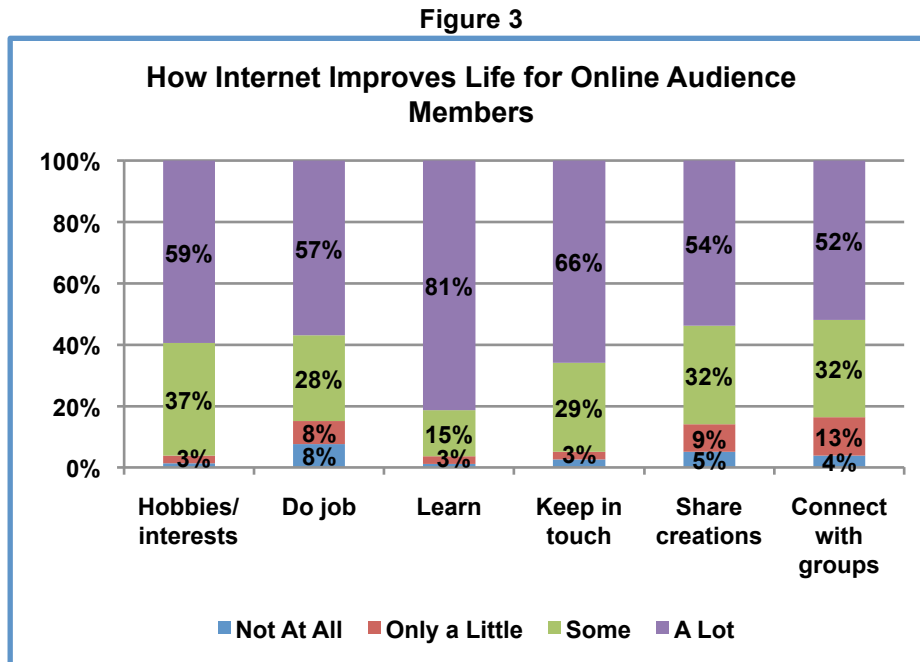
Most Online Audience members feel that the Internet has improved (*some* to *a lot*) their ability to pursue their hobbies and interests (96.2%), do their jobs (84.8%), learn new things (96.3%), keep in touch with friends and family (94.9%), share their creations with others (85.9%), and connect with groups they are members of (83.5%).

These data indicate that the Internet and digital media technologies play a central role in these individuals' lives. They rely on new media for a variety of purposes throughout their personal and professional lives, including their use of *QUEST*.

How do they interact with QUEST *online?*

Like the general KQED audience members, Online Audience members seek out *QUEST* content because they appreciate the uniqueness and quality of the content. They access this content online primarily for convenience. As Figure 4 below shows, nearly one quarter visit the site a few times a week or more. When there, they are far more likely to seek out video pieces than any other content types.

Figure 4

How Often Online Audience Members Access KQED/ QUEST

Daily
4%

Never
13%

A few times a week
19%

A few times a year
32%

A few times a month
32%
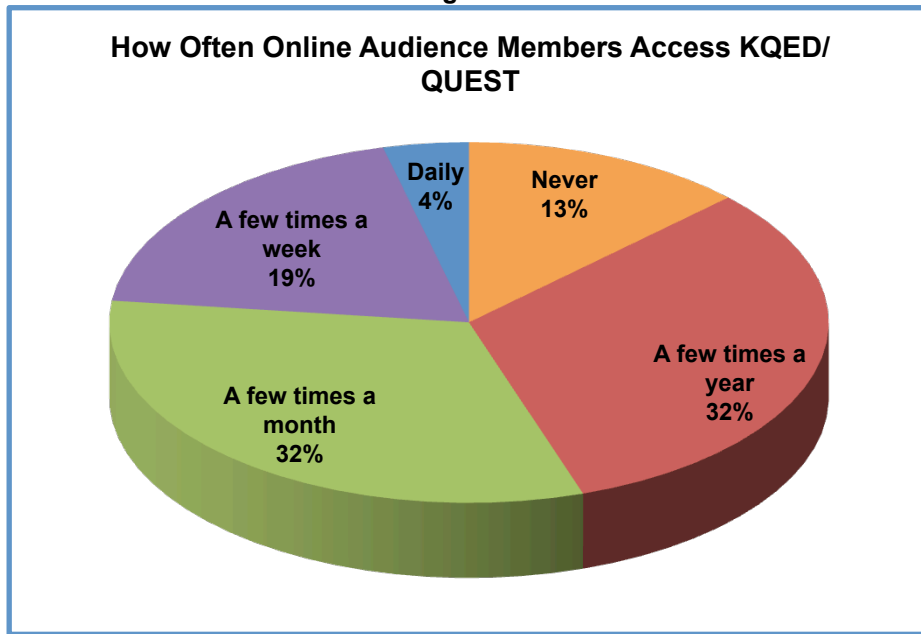
When Online Audience members were asked why they were visiting KQED/*QUEST* on they day they took the survey, the most common responses were that they were following a link from another site or their RSS blog feed (*QUEST* and other) or they were looking for/interested in the *QUEST* content. A number indicated they were checking the TV schedule. (Referral sites and institutions included: SF Ocean Film Festival, Climate Watch, UCSC News, Modern Sailing Club, Café Scientifique event, and World Changing.com.)

Figure 5

Online Audience Members' Ratings of QUEST Quality (n=71)

Fair
8%

Good
30%
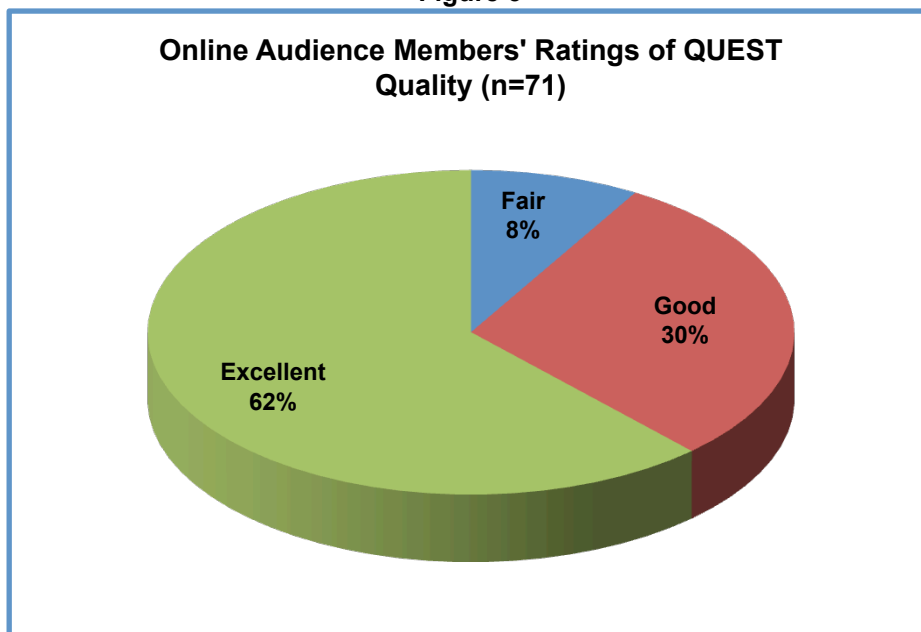
Excellent
62%

As Figure 5 above indicates, close to two-thirds of Online Audience members rated *QUEST*'s quality as *excellent*. Furthermore, the content of *QUEST*'s programming is the number one force that drives them to *QUEST* content online. When asked why they seek out *QUEST* online, 93% indicated it was because of the content, particularly its uniqueness, and 57% mentioned convenience, for example:

> *Seek the unsought. Learn the unlearned. Know the unknown.*

> *I use most online media for convenience. I might add that QUEST is fairly unique in the media to which I do subscribe....*

Throughout the evaluation of *QUEST* audiences, two factors have proven constant across age, gender, interest in science, and with both Educators and non-Educators:

(1) *QUEST* videos are the most frequently used type of content; and
(2) environmental issues garner the most interest.

As Figure 6 shows, nearly three-fourths of the Online Audience members seek out video pieces, far more than the other types of media available. Still, one-third listen to audio segments, and roughly one-fourth are using the blog and Explorations.

Figure 6
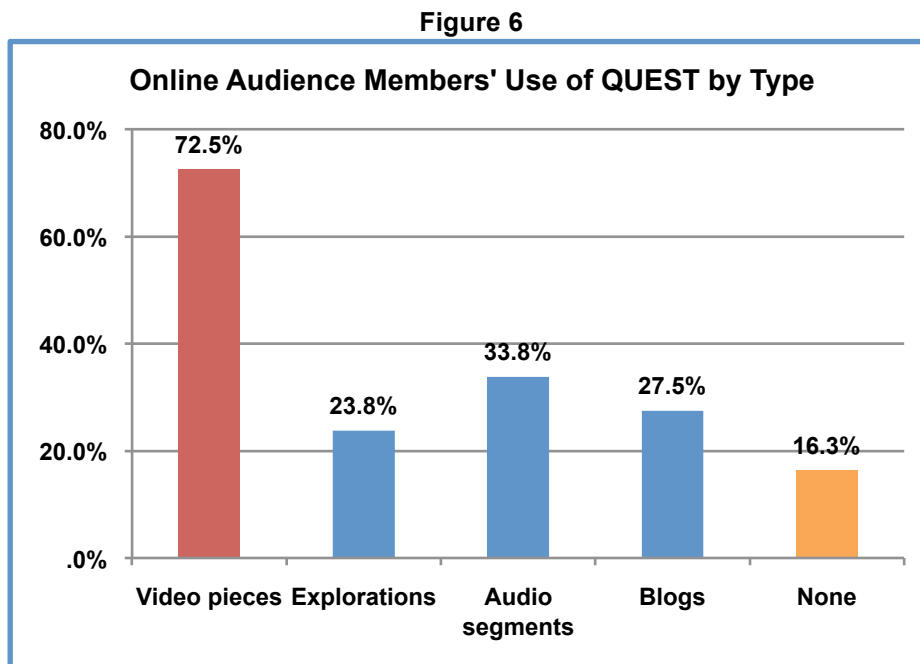
As mentioned, these Online Audiences differ quite a bit from the general KQED audience in their use of *QUEST* digital media. Data from the Panel Study conducted in Year 2 indicate that use of *QUEST* online was fairly low among that group. Interest, however, was high. Approximately two-thirds of panelists said they accessed online audio and/or video content and would continue to do so or *that they were interested in doing so in the future*.

Moreover, while only a handful of panelists had used *QUEST* Explorations, 83% indicated they were interested in doing so.

After the environment (87.5%), Online Audiences were most interested in Biology (75%) and Health (61.3%) stories. In general, though, these individuals were interested in a wide range of science topics, as shown in Table 3. (For a list of "other" interests, see the Appendix.)

Table 3
Online Audiences' Content Area Interests

Content Area	%
Astronomy	50.0
Geology	48.8
Biology	75.0
Health	61.3
Chemistry	45.0
Physics	46.3
Engineering	48.8
Weather	47.5
Environment	**87.5**
Other	17.5

Since the Online Audience members are quite comfortable with technology and regular users of online media, it should be no surprise that they reported few challenges to using *QUEST* online. As Figure 7 below indicates, for half of respondents, their challenge was finding time to do so.

Figure 7

Challenges Audience Members Face When Using KQED/QUEST Online (n=54*)

Does not include those who faced no challenges (n=26)

Bar chart values: Lack of tech skills 7.4%, Lack of bandwidth 14.8%, Finding content 24.1%, Lack of time 50.0%, Lack of interest 13.0%, Other 24.1%
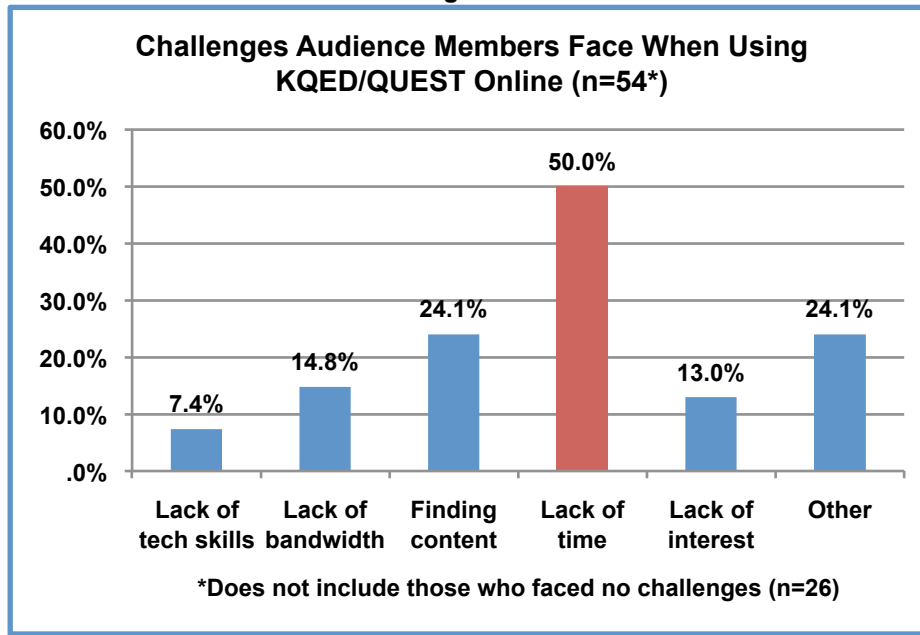
When asked how *QUEST* could serve them better, Online Audience members offered a range of ideas about content and new and interactive features. While a few criticized the content (mostly for not being high level), many took the opportunity to express their satisfaction with *QUEST*. (The Appendix presents a list of comments organized by type: complimentary feedback, critical feedback, content suggestions, and feature suggestions.)

Conclusions

KQED's own web metric data, as well as national research such as the Pew Internet and American Life Project, indicate that the online media audience is steadily expanding. While the Pew data presented in this report are "only" from two years ago, it is likely that the percentages of people using online media have already increased. In fact, analysis of prior years' Pew data indicates approximately a 2% rise per year for most items. Moreover, media and research organizations are still figuring out how best to understand these audiences. Pew continues to adapt their typology of new media users, now focusing on clusters of activities (e.g., Digital Collaborators).

The *QUEST* team continues to provide offerings for and uses research to understand its new media audiences. These audiences present both new challenges and new opportunities. Given that the online audiences do not match KQED's traditional broadcast audience, content needs to appeal to broader groups of individuals. At the same time, *QUEST* has the opportunity to reach new audiences with their content. These online audience members are interested in similar content areas, but they prefer to search out the content they want to see/listen to when it is of interest or use to them, a process referred

to as "pull, not push." *QUEST* Interactive has made this use possible by placing a great deal of content online, not only on their website but also through outlets such as YouTube and iTunes. Additionally, KQED has made this content available to be reposted or appropriated by the editors of a wide variety of science, nature and technology blogs and websites around the world (such as the *Naturfag* site referenced by one survey respondent). All of these activities serve to make *QUEST* available to a diverse online audience, expanding the program's reach beyond the local broadcast audience.

Another challenge that arises when addressing diverse audiences has to do with the level (i.e., complexity, difficulty) of the *QUEST* content. While some audience members have expressed concern that the content is or will become too "dumbed down," others like the tone, and some find it to be too high level (for instance, some teachers with respect to their students). While it is impossible to hit the appropriate level for all groups, the results generally point to *QUEST* satisfying audiences. Still, the *QUEST* team may want to consider leveraging online opportunities to address this issue. Supplemental materials could add more depth for those seeking high-level information and/or provide simplified explanations for use with younger/less expert audiences.

Of course, digital media offer new opportunities to engage audiences beyond basic content. The *QUEST* team is already taking advantage of opportunities to engage audiences in the creation of content and contribution to blogs, etc. Data from the panel study from Year 2 of this evaluation indicate that *QUEST* may be able to engage those not typically interested in science through their community creation and production activities.

Appendix of Open-Ended Responses for Online Audiences

"Other" Content Areas of Interest:
All nine areas, restoration in environment, Tech.
Alt energy (solar), recycling, wildlife, SF Bay, research findings
Archaeology, Paleontolgy
Biology: plant propagation especially
Computing
Genetics, Evolution
Mathematics
Optics
Policy
Sailing
Science in education & politics
species other than homo sapiens
statistics
technology (application of science)
technology interact'g w/ nature.
Water, land use
When *QUEST* does it, it's all interesting
Wildlife Conservation/Education

How QUEST Can Better Serve Online Audiences:

Feedback

Complimentary

continue doing what you're doing!

great job!

I really like the Twitter updates for KQED. I'll check out KQED Science Twitter as well.

I'm happy with it.

It is great how it is.

Keep it up!

Keep on doing what you're doing.

Keep up the good work! new videos and in-depth material to help educate the world :D

Looks good to me :-)

No way, its fine.

Not sure; good so far.

so far, so good

Stick to what you're doing, I love all the content that's available.

thanks for what you are now doing

Critical

I am less than impressed by Quest. 1- the radio program is infrequent. 2 both TV and radio are chatty, weaving in sci. industry, community (govt) but does not strike any good scientific story. Quest should work at being more distinctive. I'm sorry but I end up comparing Quest to NY Times Science on Tues. and there is a content gap. A little less chatting, quipping, and sesame street type of animation and a little more serious teaching, please.

keep making programs that your audience is really into and involved with. Sometimes the tone of the purchased programs and news sound like it's opinions and efforts are watered down to appeal to the "average person" and lack spark and fire.

Limits on reruns of segments

Sometimes it is a bit dumbed down.

Suggestions

Content

by providing educational social/cultural diversity programming

Cover local issues and suggest ways the public can effect change through volunteering

Create a Quest show for the internet that focuses on a single theme affecting an area of science.

For the Quest website & show: If you're going to be geared toward a general audience, you could at least teach them why understanding the difference between science and the application of science (eg technology or engineering) is important; and teach and re-teach the scientific method: Observation/Research, Hypothesis, Prediction, Experimentation, Conclusion, Iteration.

Have more user-contributed science stories and videos. Have episodes showing collaborative user generated science, and explaining resources available.

Have more video features that focus on the scientists not just the science.

I'd like to see more educational programs, particularly on environmental issues and how to cut back on waste.

I'd like to see more educational programs, particularly on environmental issues and how to cut back on waste.

More shows, more content.

More video segments (how to projects, current scientific events, reports from scientists/searchers).

Features

add advanced search functionality

I would like to buy the DVDs and send to my sister for her family. Are they available?

Let me know how best to communicate with you. What do you read the blog? Do you have e-mail?

More content via podcast. They're great. Thanks.

More interactive features that are slick, fun, well-made, in-depth.

open up the digital media to allow open source choices. don't clutter the page. provide links to substance, not flickr. great show; please do not dumb it down.

Thanks for asking! I really like both the TV and radio versions of Quest, and now I am on the web site. Can we do projects somehow? I would love to be involved in some kind of science activity.

upload higher quality videos and make more content available on youtube

While I live in the bay area and could, theoretically, enjoy content via traditional media like tv or radio, I access the content 100% via the internet. I'd like a way to pledge to the quest part of kqed specifically to focus my contributions where my interests are.

KQED *QUEST* Online Educators
Evaluation Report

Introduction and Background

Most of the educator data collected for this evaluation came from surveys, observations and interviews of various KQED/*QUEST* training workshops. Year 3's Online Educator Survey focused on educators who were independently visiting and using *QUEST* resources online—through both the KQED website and secondary sources such as YouTube and iTunesU. This survey was posted in conjunction with the general Online Audience Survey and included many of the same questions. The Educator Survey, however, emphasized uses of *QUEST* content and digital media resources in teaching and with students.

This survey was made available to online users at two points – January 26-February 24, 2009 and August 10-September 15, 2009 – during Year 3 of the evaluation. A total of 37 Online Educators responded to the survey. Links to the survey were posted on a number of KQED and *QUEST* web pages as well as sent out via newsletter and Twitter. Nearly two-thirds of Online Educator respondents were visiting a KQED Web page when they found the survey link, and more than half of those respondents were visiting *QUEST* (See Table 1.)

Table 1
Where Online Educators Found Survey Link

Location of Survey Link	%
KQED Web link	*64.9*
General KQED page	2.7
KQED Education page	5.4
KQED Science Education page	5.4
QUEST page	51.4
KQED Communication	*18.9*
QUEST Newsletter	13.5
KQED Science Twitter	5.4
QUEST Secondary Source	*5.4*
QUEST on YouTube	5.4
QUEST on iTunesU	0.0
Other Source	*10.8*
Colleague/Friend	8.1
Non-KQED site	2.7

The goal of the surveys was to gain information regarding the ways in which Online Educators access and use *QUEST* with their students, as well as their interests in and attitudes toward digital media. The results presented in this report complement the pictures of both the general online audiences and the educators who attended *QUEST* trainings offered in other sections of this final collection of reports. These results are further contextualized by data from two others studies of educators using online public broadcasting science resources (for Teachers' Domain and NOVA[1]).

Who are they?

As Table 2 displays, more than half of Online Educators teach high school students (59.5%) in public schools (56.8%), and between 40 and 50% teach science courses. Approximately three-quarters (73%) of the respondents are women, and over two-thirds (67.6%) live in Bay Area. A majority (53%) have attended some form of technology training/professional development, including 36% who attended a KQED training.

Table 2
Overview of Online Educators

Educational Setting	%	Grade(s)	%	Subject(s)	%
Public school	56.8%	K-5	40.5%	Lang Arts	16.2%
Private school	10.8%	6-8	40.5%	Math/CS	21.6%
Informal Ed	10.8%	9-12	59.5%	Earth Sci	45.9%
Homeschool/parent	2.7%	Post-Sec	16.2%	Life Sci	48.6%
Adult ed	5.4%	Adult	21.6%	Physical Sci	40.5%
Other	13.5%			Social Science	13.5%
				Humanities	21.6%
				Other Subjects	35.1%

One may expect teachers using online media to be relatively young/early career, but that is not the case. These Online Educators tend to be mid- to late-career: 35.1% have been teaching for 4-9 years and 45.9% for 10 or more, and the median age range is 45-54. Two other studies of educators using online science media resources report similar results. Most of the educators who participated in a pilot study of KQED's Teachers' Domain resources during the 2007-2008 school year had been teaching for 5-10 years (36%) or

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[1] Hipps, J. (2008). *Evaluation of the KQED's Localization of the Teachers' Domain.* San Francisco, CA: WestEd. *NOVA Teachers Web Site National Survey Results.* (2007). Boston, MA: WGBH Research.

10+ years (42%). Moreover, a national survey of NOVA Teachers Web users reported that 20% of their respondents had been teaching for 11-20 years.

How do they interact with new media?

Like the general Online Audience members, *QUEST's* Online Educators use a wide variety of new media technologies and express extremely positive attitudes toward them. As Figures 1 and 2 (below) show, most Online Educators report accessing music/radio and TV online between a few times a month and a few times a week, 60% have created web pages, and nearly three-fourths have shared something they created with others online.

Figure 1

Educators' Online Media Activities

	Never	Few times a year	Few times a month	Few times a week	Daily
Listen to Music/Radio Online	14%	8%	22%	32%	22%
Watch TV Online	19%	8%	22%	38%	11%
Download Music	16%	11%	46%	19%	5%

Figure 2

Online Media Creation Activities

Activity	Percentage
Remix Material	37.8%
Create Webpage for Others	43.2%
Create Webpage for Self	59.5%
Post Comments to Website	62.2%
Share Own Creation	73.0%
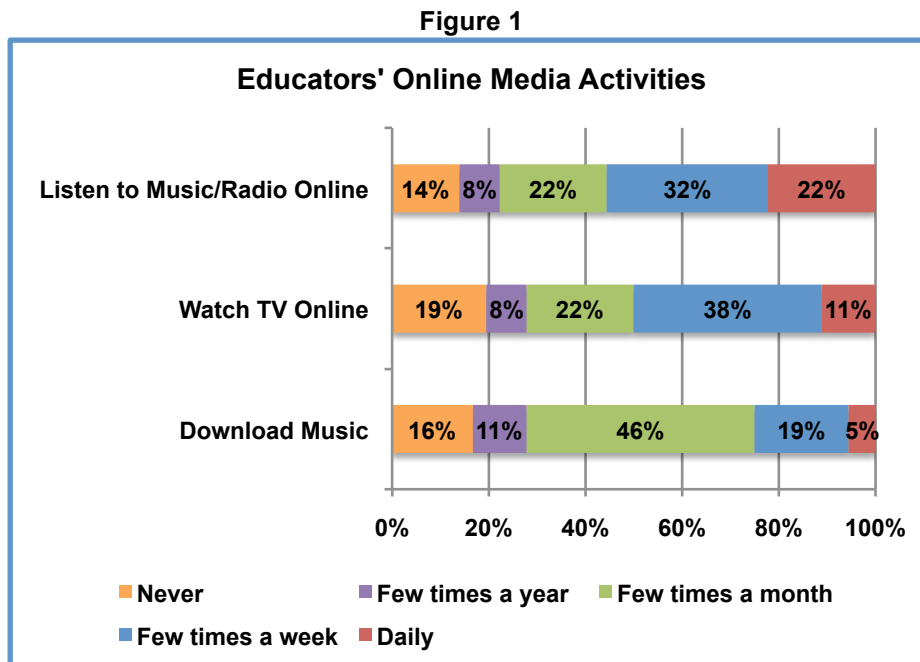
These Educators also use many forms of media with their students. In fact, at least 50% use the following media: TV, online video, websites, online maps, and downloaded lesson plans (See Figure 3).

Figure 3

Educators' Use of Digital Media in Teaching

Media	Percentage
Radio	43%
Online Audio	27%
TV	57%
Online Video	62%
Websites	65%
Wikis	24%
Blogs	14%
Online Maps	57%
Photosharing	22%
Online Bookmarking	11%
Online Collaboration Tools	30%
Downloaded Lesson Plans	51%
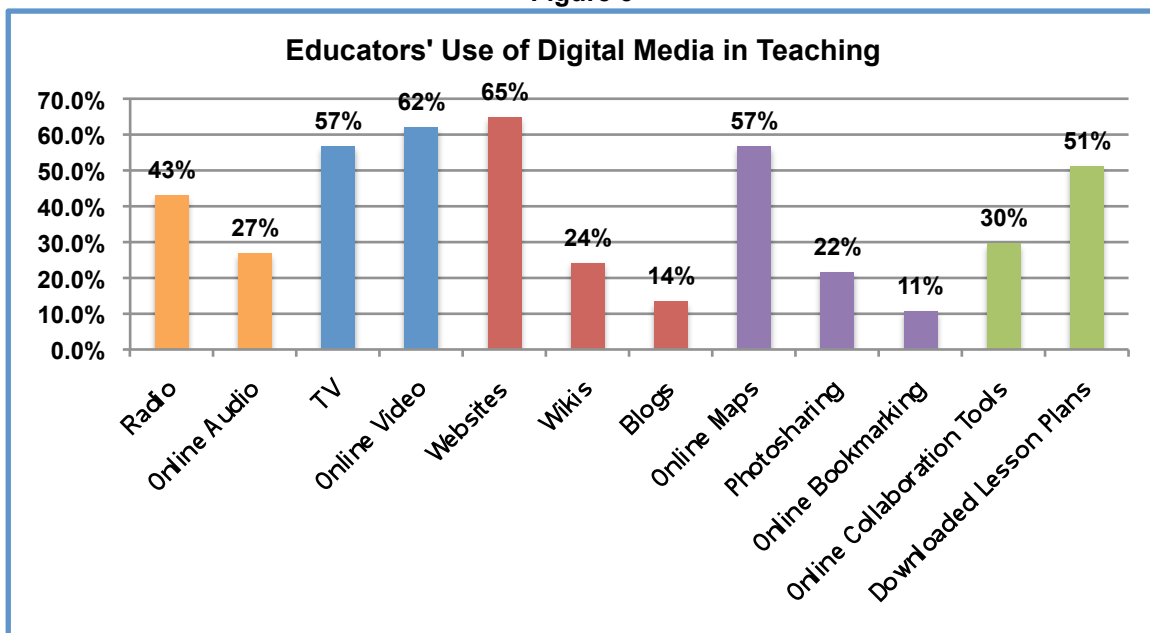
These Online Educators' top three media used with students – websites, video and lesson plans – are the same ones cited by the 2008-2009 Science Education Institute participants. NOVA Teachers' Web survey respondents also indicated that video and teachers' guides were the most useful aspects of that site. This data corresponds to the reasons Online Educators seek out science content online, as well. By far, the most common reason was to find background information and/or lesson content.

Online Educators were asked to rate a series of statements regarding their attitudes toward using technology in their teaching. Figures 4a and 4b (below) present the results of these questions.

Across the board, Online Educators express quite positive attitudes. Approximately 90% feel that technology enhances student learning and brings concepts to life and that students need to learn to use technology. Some Educators did express concern that technology takes time away from learning and/or distracts students from learning content, though.

Figure 4a

Educators' Attitudes Toward Technology
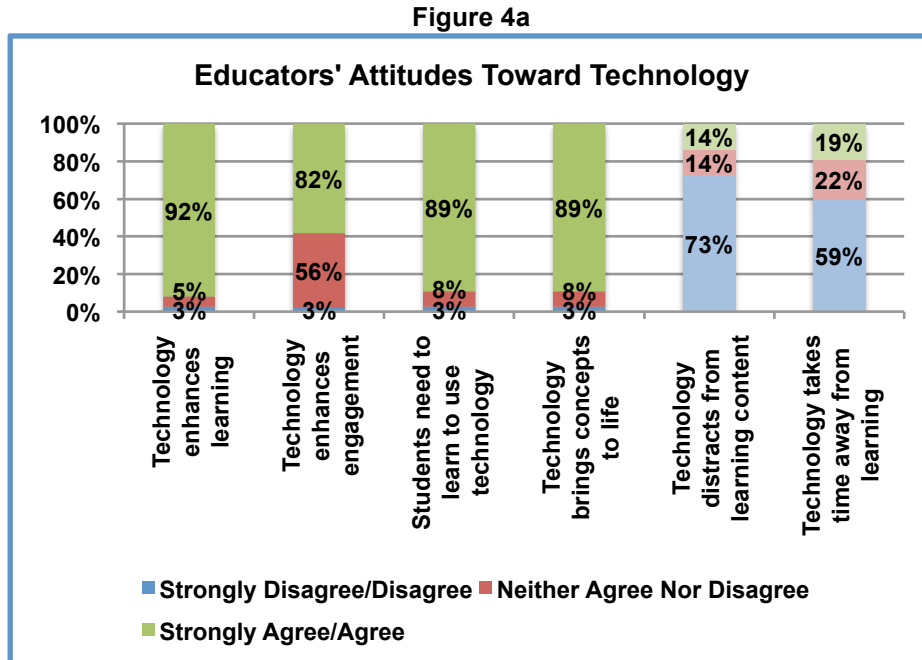
Most Online Educators (89%) believe that technology helps them do their jobs, and only one did not feel it was important for them to learn how to use technology. In contrast to these positive attitudes, only one-third felt their schools had adequate tech support.

Figure 4b

Educators' Attitudes Toward Technology

Stacked bar chart with y-axis from 0% to 100% in 20% increments.

- **Educators need to learn to use technology:** Strongly Agree/Agree 97%, Neither Agree Nor Disagree 3%
- **I am comfortable using technology:** Strongly Agree/Agree 89%, Neither Agree Nor Disagree 8%, Strongly Disagree/Disagree 3%
- **My school has adequate technology support:** Strongly Agree/Agree 33%, Neither Agree Nor Disagree 24%, Strongly Disagree/Disagree 43%
- **Technology improves my ability to do my job:** Strongly Agree/Agree 89%, Neither Agree Nor Disagree 8%, Strongly Disagree/Disagree 3%

Legend: ■ Strongly Disagree/Disagree ■ Neither Agree Nor Disagree ■ Strongly Agree/Agree

As Figure 5 shows, access and time were by far the challenges faced most often by Online Educators when using technology. Coinciding with those who felt their schools did not have enough tech support, nearly half indicated they did not have enough access to technology at school. Overall, though, the percent of Educators who felt they faced each challenge was small, and six respondents felt they faced no challenges.

Figure 5

Challenges Educators Face in Using Technology*

- Educator's lack of interest: 0.0%
- Students' lack of home access: 32.3%
- Lack of access at school: 48.5%
- School's lack of ability: 9.7%
- Students' lack of ability: 6.5%
- Educator's lack of ability: 12.9%
- Lack of planning time: 38.7%
- Lack of class time: 35.5%
- Other challenges: 16.1%

x-axis: 0.0% 10.0% 20.0% 30.0% 40.0% 50.0% 60.0%

*N=31; Excludes 6 who faced "no challenges"
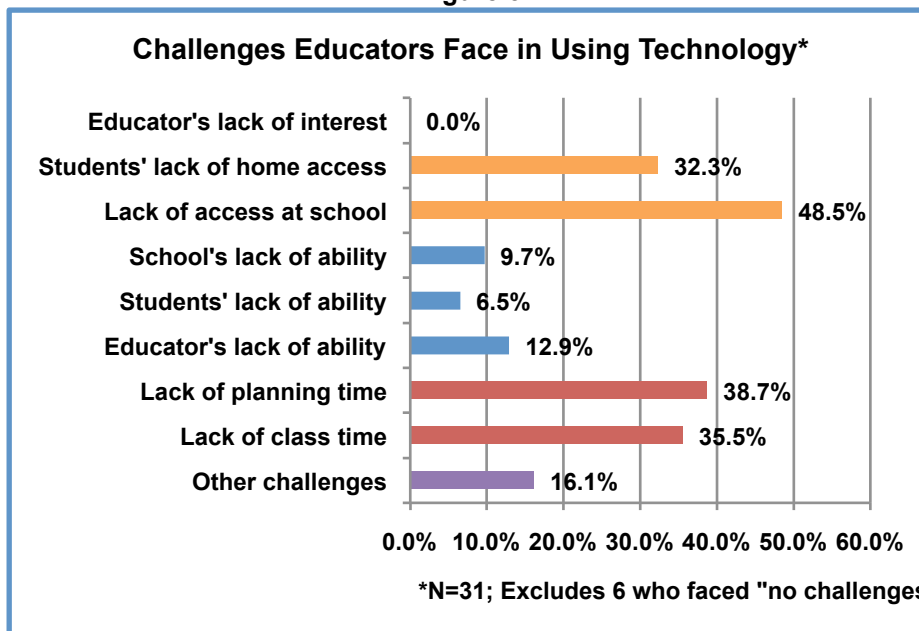
How do they interact with QUEST?

Throughout the evaluation, *QUEST* audiences have consistently expressed the belief that the *QUEST* content is high quality, and the Online Educators are no exception (M=4.52 on a 5 point scale that ranged from 1=very poor to 5=excellent (excludes 4 "don't know")).

Relying on that level of quality, a number of Online Educators indicated that they regularly check the *QUEST* site for new content. Further, as Figure 6 illustrates, while one-fifth have not used QUEST with their students, more than 1/3 do so *at least* a few times a month.

Figure 6
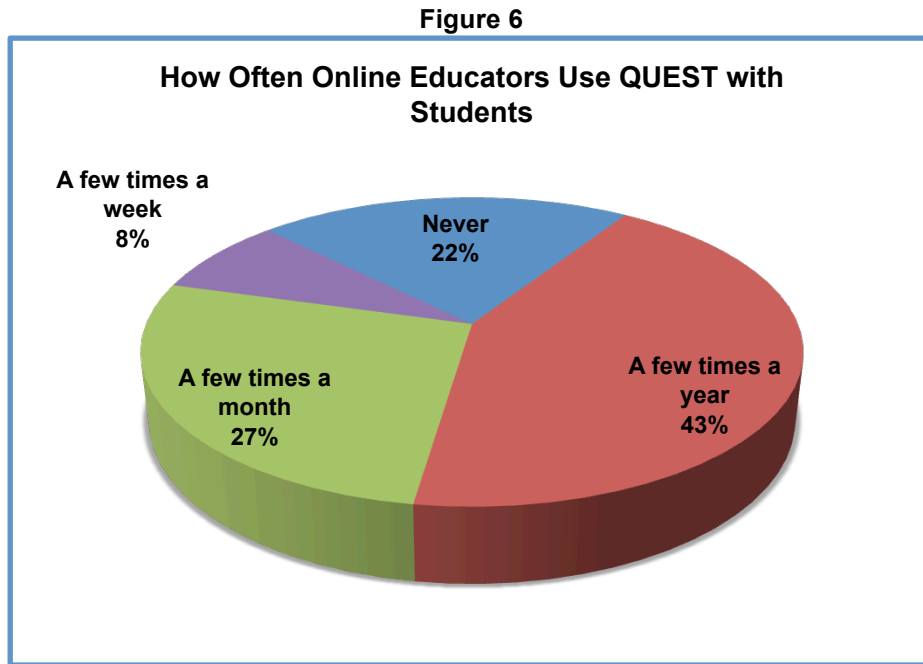
This regular use of *QUEST* content with students by Online Educators is higher than has been reported elsewhere in this evaluation. Moreover, participants in the Teachers' Domain study reported using *any* streaming audio/video content with students at about the same rate (25%) as these Educators use *QUEST*.

Figure 7 below shows that when Online Educators do use QUEST with students, they are most likely to use video segments (62.2%), followed by Educator Guides (45.9%).

Figure 7

Online Educators' Use of QUEST with Students

Category	Percentage
None	21.6%
Educator Guides	45.9%
Explorations	5.4%
Blogs	5.4%
Audio Segments	18.9%
Video Pieces	62.2%
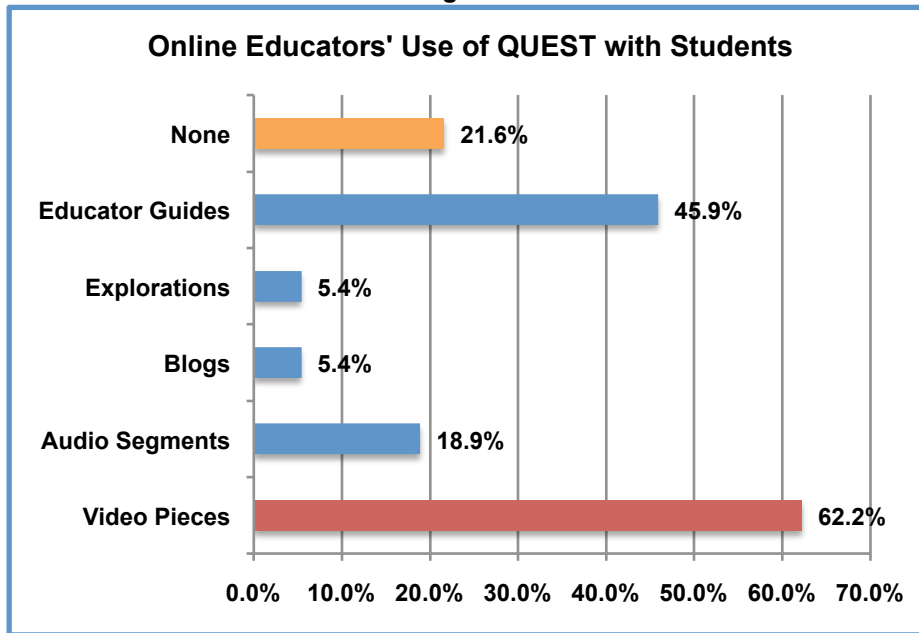
This data was supported by the Online Educators' indications of which types of *QUEST* science content they find most useful, with 70% selecting videos (See Figure 8).

Figure 8

Most Useful QUEST Science Content Types

Content Type	Percentage
Audio-only	5%
Audio w/photos	35%
Video	70%
Photos -only	16%
Blog posts	11%
Explorations	30%
Short stand-alone	57%
Long w/segments	38%
Long in-depth	22%
Local content	38%
Cutting edge content	60%
Educator Guides	51%
Supplemental info	46%
Tech "how to" guides	38%
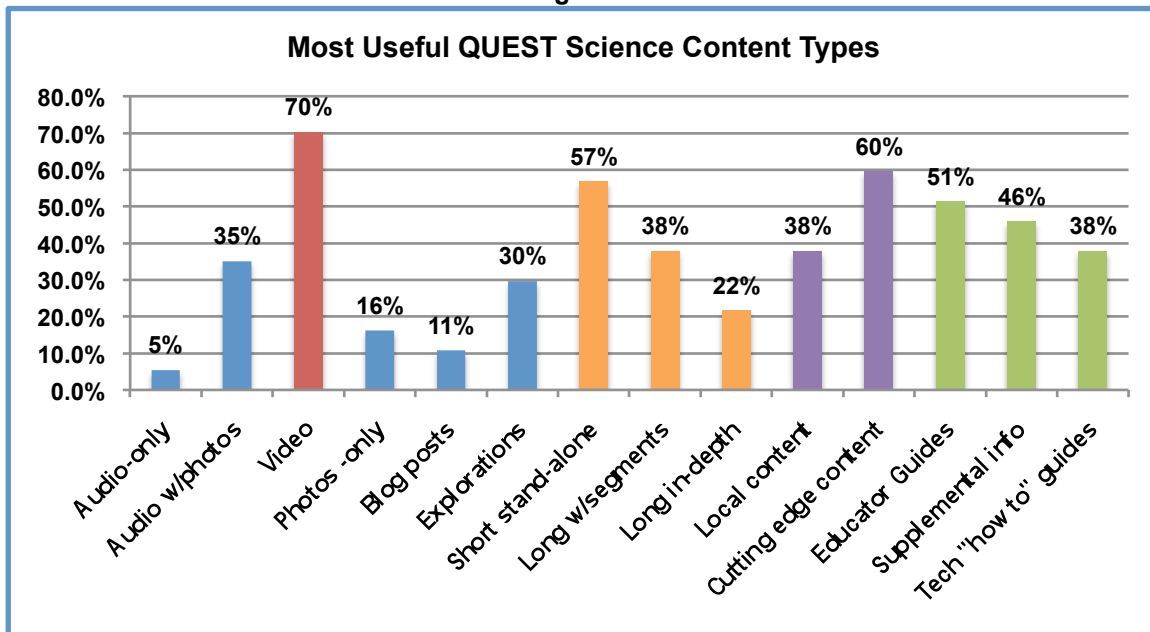
Figure 8 categorizes types of content not only by medium (blue) and materials (green) but also by format (orange) and type (purple). Looking across these categories, one can

determine that Online Educators find *short, stand-alone video segments featuring cutting-edge content with associated educator guides* the most useful. This finding has proven robust across evaluations of *QUEST* educators, as well as with those taking part in the Teachers' Domain and NOVA Teachers' Web studies. Indeed, 75% of the NOVA teachers reported a preference for NOVA programs broken into short segments.

Conclusions

Overall, the *QUEST* Online Educators are quite happy with the content and supplemental materials offered. They are part of a group of educators who believe it is important to incorporate technology and digital media in their teaching, one of *QUEST's* goals. As these and similar educational users are studied, a picture begins to emerge. Educators look to online content to supplement their teachings with up-to-date and engaging content that can illustrate concepts and bring in a real-world connection. Still, a number of questions need to be addressed.

The data indicate that most educators using online media are mid- to late-career. While younger educators may be expected to be more comfortable with new media than their more experienced counterparts, it may be that the latter group has more time and resources to explore these offerings. It may also be that these educators feel more pressure to remain relevant to students, one reason given for using digital media.

There is not yet a great deal of data regarding how online content is being used although this evaluation has provided some examples. While there is not enough data to say for sure, the regular or consistent use of *QUEST* content in lessons – as opposed to a one-time event – seems to be emerging as a trend. Both the quantitative data here and the case studies demonstrate this type of use.

KQED *QUEST* 2008-2009 Science Education Institute
Evaluation Report

Introduction and Background

QUEST is a multi-year, multiple-media project seeking to influence the Bay Area's discussions about science, the environment, and nature, with a particularly local focus. As part of that mission, KQED launched a Science Education Institute and Program for the 2008-2009 school year. The Program brought together approximately 40 educators from a variety of Bay Area school districts. Educators participated in a two-day training Institute, either at the Alameda County Office of Education (ACOE) or the San Mateo County office of Education (SMCOE) in August 2008. Program Educators also met for a Mid-Year Sharing session and additional training (optional) in January 2009, and some attended a wrap-up event in May 2009. In addition to these meetings, *QUEST* Education Project Supervisor Jessica Neely scheduled individual or team meetings with the Program Educators to support implementation of *QUEST* content and digital media throughout the school year.

To evaluate the effectiveness and outcomes of participation in the Science Education Institute and Program, Rockman et al (REA) administered a Background Survey and Media Diagnostic (July 2008), observed and conducted debriefing sessions at the end of each Institute and workshop day (August 2008, February 2009, and May 2009), and administered a Follow-Up Survey at the end of the Program year (June-July 2009). Forty-three Educators filled out the Background Survey, and 39 continued to participate in the year-long Program. The Follow-Up Survey garnered a 59% response rate (n=23).

While the Follow-Up Survey response was lower than we had hoped, it is not entirely unexpected one-year after the initial training workshop. It may reflect a number of factors. First, participation in program activities did fall off throughout the year, and only a small number of Educators attended the end-of-year event. Second, the survey went out after the end of the school year, when it is often difficult to get teachers' attention. Third, early on there was some confusion among participating Educators on the scope and requirements of the Program. A number believed they were signing up for the two-day Institute, only, and did not realize there was a yearlong commitment. Finally, it is likely that the economic difficulties and job uncertainty facing California educators contributed to the lower participation and responses.

This report presents the results of these observations and surveys. Given the small number of respondents to the Follow-Up Survey, the results need to be approached with some caution. They do not represent a full picture of activities and outcomes for all participants, but they do provide trends in outcomes and implementation.

Key Findings

- Program Educators felt that both their ability to use new media and knowledge of 21st Century skills increased as a result of their participation.

- Nearly all participants shared their newfound knowledge with their colleagues.

- As a result of participation, Program Educators reported increases in the use of a wide variety of digital media and *QUEST* resources with their students.

- Most participants felt that new media and *QUEST* content engaged their students and that using these resources added value to their classrooms.

Institute Participant Overview

Participants. Sixteen teams of Educators, made up of middle and high school science and math teachers, technology specialists, and department chairs from 12 Bay Area school districts, participated in the Program. Prior to attending the summer Institute, Educators filled out a Background Survey and Media Diagnostic (n=43). Tables 1 and 2 on the following pages present an overview of these Educators' background information.

The majority of Program Educators were classroom teachers (n=35). Quite a few served in additional (and multiple) capacities, as well. Those who selected "Other" as their role included content specialists, regional leaders, and other specialists. While many participants taught multiple grades and multiple subjects, most generally worked with students in grades 6 through 12, and almost half taught Biology or Life Sciences.

With one exception, the teachers specified the type of teaching certificate they held. These ranged from 31 teachers who held single subject certificates in a range of sciences to a handful who held certificates in multiple subjects, special education, physical education, and NCLB certification. In addition to their credentials, this group of participants had substantial teaching experience. More than half (n=23) had been teaching for 10 or more years.

Table 1
Participant Demographics (n=43)

Category	Response	N	%*
Role	**Classroom Teacher**	**35**	**81.4**
	Department Chair	13	30.2
	Technology Specialist	6	14.0
	Other	7	16.3
Grade	K-5	21	7.0
	6	10	23.3
	7	11	25.6
	8	11	25.6
	9	26	60.5
	10	27	62.8
	11	29	67.4
	12	27	62.8
Subject	**Biology/Life Science**	**21**	**48.8**
	Physics/Physical Science	13	30.2
	Environmental Science	13	30.2
	Earth Science	11	25.6
	Chemistry	9	20.9
	Math	8	18.6
	General/Integrated Science	5	11.6
	Marine Science	2	4.6
	Art	2	4.6
	Other	13	30.2

* Total is more than 100% as participants could select more than one response.

Table 2
Participant Background (n=43)

Category	Response	n	%*
Education	**Bachelor's Degree**	**42**	**97.7**
	Master's Degree	27	62.8
	PhD/Professional Degree	2	4.7
	Teaching Credential	**32**	**74.4**
	Other	5	11.6
Years Teaching	1-3	5	11.6
	4-6	11	25.6
	7-9	4	9.3
	10-15	8	18.6
	16-20	7	16.3
	More than 20	8	18.6

* Total is more than 100% as participants could select more than one response.

Professional development. In the Background Survey, Program Educators were asked how often and what types of professional development sessions they attend on an annual basis. Nearly all Educators typically attended each type of session – hands-on workshops, presentations from outside experts and demonstrations of lessons and/or teaching strategies – at least 1-2 times per year (See Figure 1 below.). But, participants attended hands-on workshops *more frequently* than the other types; almost half of participants (n=20) reported attending a hands-on workshop three times a year or more.

Other types of professional development participants reported attending included meetings with a mentor, web-based professional development, Gene Connect, and CEU Units for license renewal.

Figure 1

Annual Participation in Professional Development
(n=43)
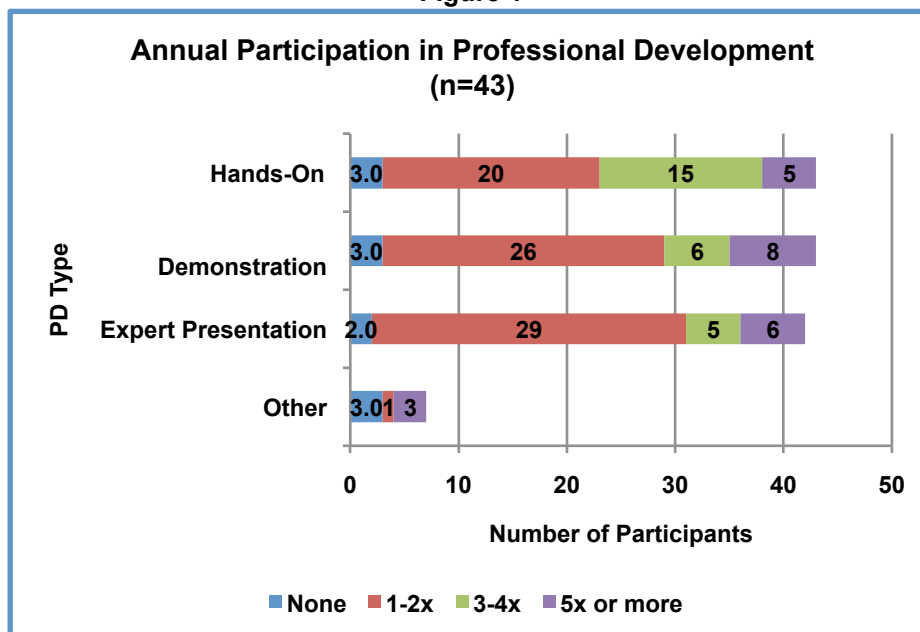
Prior to the Science Education Institute, only 12 of the 43 participants reported that they had attended a KQED workshop. Of those, a few had attended a *QUEST* workshop while others attended media workshops for other programming. More than half of participants learned about the *QUEST* Science Education Institute and Program through a colleague (n=26) while 12 heard about it through a KQED mailing. A handful (n=4) found out about the Institute through a newsletter or listserv. (In the Follow-Up Survey, Educators were asked for feedback regarding their interest in future *QUEST* trainings. Those data are presented in Appendix A.)

The remainder of this report presents the goals and outcomes of participation in the Science Education Institute and Program for 2008-2009. The goals and expectations are derived from Institute and workshop observations by REA staff, conversations with the *QUEST* team, and Program Educator responses to the Background Survey. The reported outcome measures for both Educators and their students come from responses to the Follow-Up Survey.

Institute & Program Goals

The fundamental goals for the *QUEST* Science Education Institute and Program were to:

- Increase *access* to *QUEST* content by Bay Area schools and informal science education organizations to support student engagement so that relevant curriculum is taught in science classrooms and there is an increased engagement of students in

science classrooms and informal educational settings.

- Increase *resources and support* for incorporating the 21st century skills of Information, Communication, and Technology into the science classroom so there is an increased *use of* 21st century skills of these skills in the science classroom.

To meet these goals, the Program combined training workshops with collaboration and ongoing support throughout the 2008-2009 school year.

Two-day Institute. The centerpiece of this Program was an intensive, two-day training Institute designed to teach Educators how to integrate *QUEST* materials and content and digital media technologies into their classrooms. Program Educators attended this workshop either on August 11-12 at SMCOE or on August 14-15 at ACOE.

During the first part of the workshop, Educators were introduced to *QUEST*'s media content and Web site, discussed the meaning and importance of 21st Century skills, and joined the Institute space in Ning (a social networking Web application). Educators then had the opportunity to attend two of the following three break-out sessions:

- Media basics – how to access and stream/download *QUEST* content via the *QUEST* Web site and iTunes; an introduction to podcasting and social bookmarking (e.g., Delicious);

- Blogging – *QUEST* blog & integration; how to use blogs in the classroom; and

- Digital photography – how to post photos to and use Flickr; *QUEST* Flickr resources.

On Day 2 of the Institute, participants were introduce to additional PBS resources (e.g., PBS Teachers Domain, Jean-Michel Cousteau Ocean Adventures), discussed the meaning and importance of media literacy as part of 21st Century Skills, and learned about how they could use Google Maps and *QUEST* Explorations with students. Much of Day 2 was devoted to group project work. Educator teams were asked to design a project for the upcoming school year using *QUEST* content and digital media tools.

At the end of each day, REA staff conducted debriefing sessions in which participants were asked what was going well, what had stood out for them that day, and what suggestions they had to improve the Institute. When possible, this feedback was implemented immediately by *QUEST* staff. For instance, Educators at the SMCOE session said they wanted more hands-on time with the technology and planning with their colleagues. So, on Day 2 of that workshop and on both days of the ACOE session, additional group work time was added. Comments made in the debriefings confirmed that participants appreciated both this additional group work time and the fact that their feedback was implemented a great deal.

Collaboration and sharing. Another key goal of the Program was for the Educators to take what they learned at the Institute and share it with their colleagues. To help meet this goal,

QUEST required that each school assemble a team of Program Educators. Those teams were encouraged to work together throughout the school year to implement lessons and activities based on what they had learned in the Institute workshop. Moreover, many of these participants were lead teachers and technology specialists at their schools, which put them in a position to teach their colleagues about using *QUEST* materials and digital media.

As Figures 2 and 3 demonstrate, these goals of sharing and collaboration were met.

Figure 2

% Who Shared Knowledge with Colleagues (n=23)

Figure 3
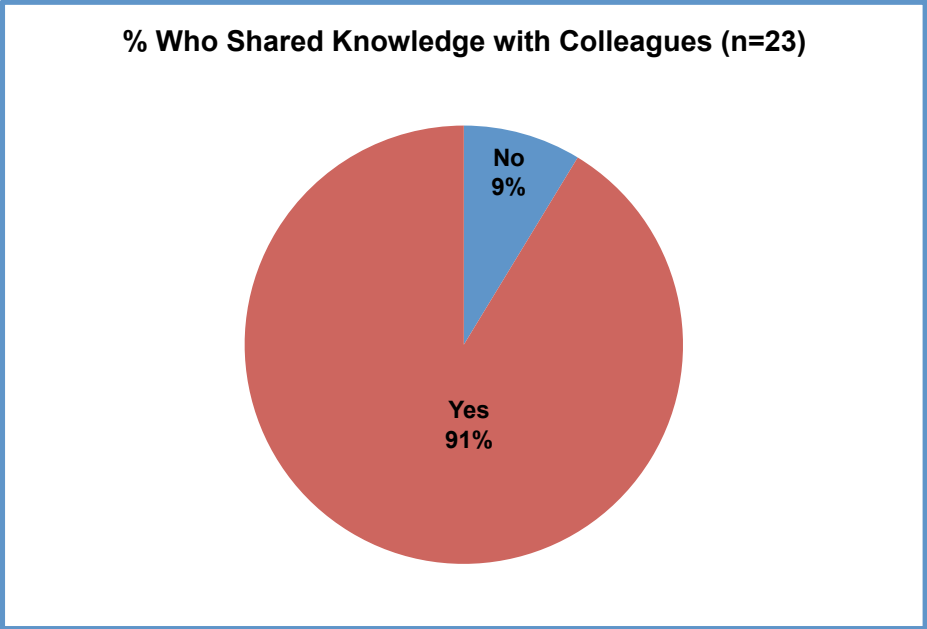
% Who Met with Institute Team During Year (n=23)
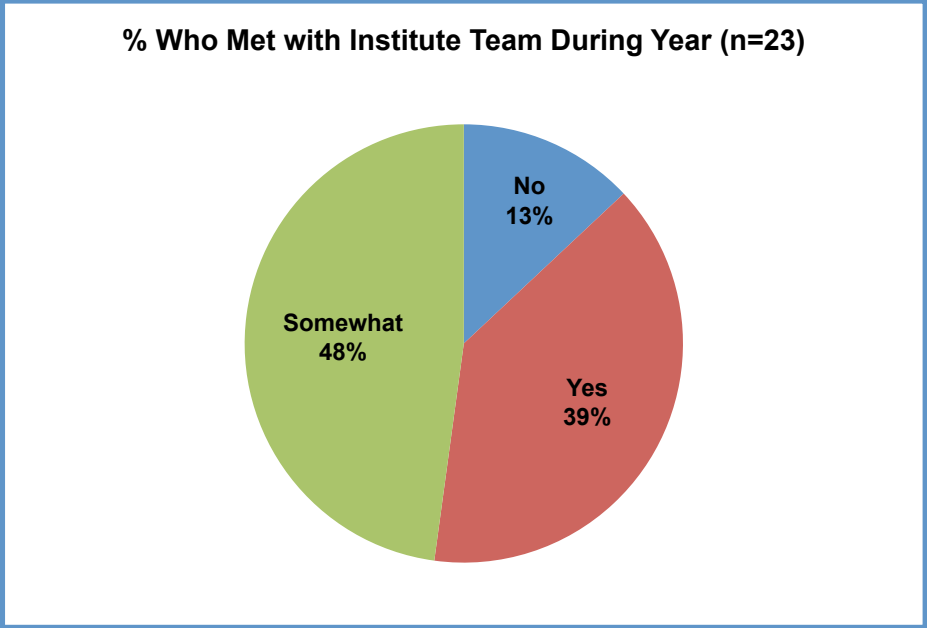
Nearly all (91%) Educators who responded to the Follow-Up Survey shared their newfound knowledge with their colleagues. And while some teams managed to meet and work together throughout the school year more successfully than others, only 3 participants indicated that their team did not meet at all.

Educators' goals. The Program Educators also came to the Institute with goals in mind. As Table 3 shows, the goals shared by nearly all Educators involved increasing their knowledge and resources. More than three-quarters of Educators also shared a number of student-related goals, including increasing engagement and improving achievement. Other goals for the workshop ranged from learning new skills to working with progressive teachers.

In terms of using media in their classrooms, almost all participants were interested in learning about resources available to use in the classroom (n=39) and learning how to integrate digital media and technology tools into the science classroom (n=38). About two-thirds were also interested in finding activities related to teaching media making to students (n=28) and one-third was interested in learning about pedagogical reasons for using digital media and technology tools in the classroom.

Table 3
Participant Goals for Workshop (n=43)

Goal	n	%
Learn about new educational resources	**40**	**93.0**
Enhance current knowledge	38	88.4
Get fresh ideas	36	83.7
Engage students	33	76.7
Improve student achievement	33	76.7
Integrate technology into their school/classroom/program	32	74.4
Learn new skills	30	69.8
Improve teaching strategies	30	69.8
Network with colleagues	29	67.4
Build a professional team	25	58.1
Share successes	19	44.2
Offer feedback to inform a new project	17	39.5
Other: Work with progressive teachers	1	2.3

Both the *QUEST* team and Educators came to the Science Education Institute and Program with a number of goals. *QUEST* wanted to increase the use of its materials in science education and expand 21st Century skills for both teachers and students. Educators wanted to learn about resources and how to incorporate technology into their classrooms so that they could increase student engagement and learning. The following sections present data and outcomes related to both the *QUEST* team's and Educators' goals for the Science Education Institute and Program.

Media Use

One of the most fundamental goals of the Institute and Program was to increase the use of new media and technologies and *QUEST* resources by Program Educators. This section examines Educators' media use both before the Institute and during the school year. It reports data from both the pre-Institute Media Diagnostic, which provided the *QUEST* Educator Institute team with baseline information regarding participants' comfort levels and experience using a variety of media, and the Follow-Up Survey, which asked Educators' to report on their school year media use – both general and *QUEST* specific. Highlights from these data are presented below. For a more detailed look at the Educators' media use – both before and after the Institute – see Appendix B.

General media. Educators were asked to indicate their comfort levels with using a variety of media before attending the Institute (See Figure 4.).

Figure 4

Comfort Levels with Various Media Types (n=43)
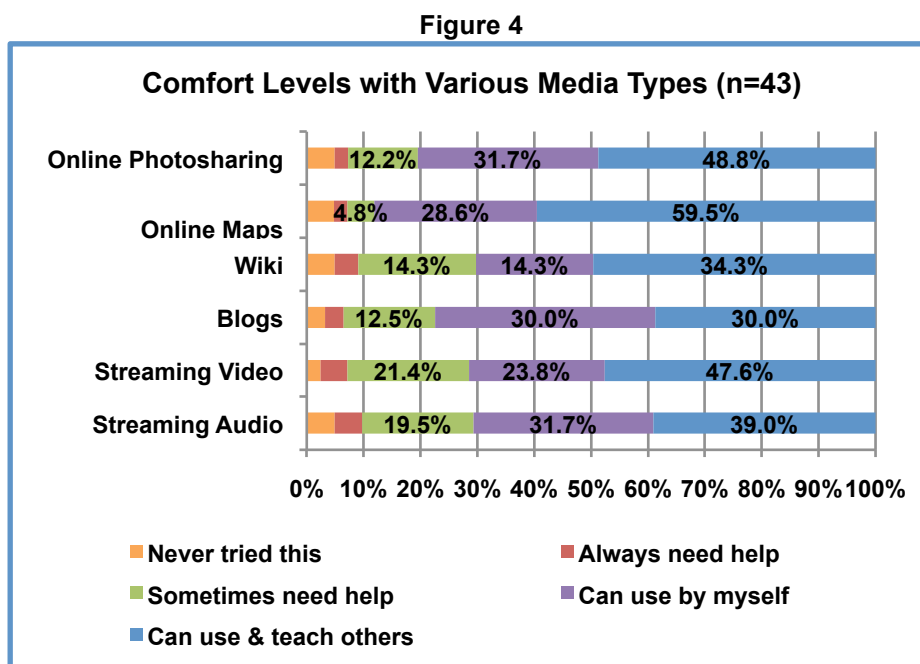
Participants were generally comfortable streaming media (both audio and video) and using online tools such as maps and photosharing, not needing any help with these media types. (Caveat: Observations by REA staff lead us to believe that the Educators were comfortable *using* online maps, i.e., for directions, but not *creating* maps, a skill taught at the Institute.) They were less comfortable using wikis and blogs; one-third of participants indicated that they had never tried using a wiki, and one-quarter had never used a blog.

Participants were also asked about their media use in multiple contexts. Highlights from the pre-Institute data include:

- Personal use – The most commonly selected media for personal use were radio (90.7%) and Web sites (88.4%).

- Own learning – Participants were most likely to select Web sites (88.4%) and TV (76.7%) as the media they use for their own learning.

- Train colleagues – By far, Web sites (41.9%) were used the most to train colleagues. The only other medium selected by at least 20% of Educators was downloaded lesson plans (20.9%).

- Classroom – Educators were also most likely to use Web sites (86.1%) in their classrooms. Two other media were selected by more than half of participants: downloaded lesson plans (67.4%) and videos (58%).

Figure 5 offers a comparison of Educators' media use from the pre-Institute and Follow-Up surveys.

Figure 5
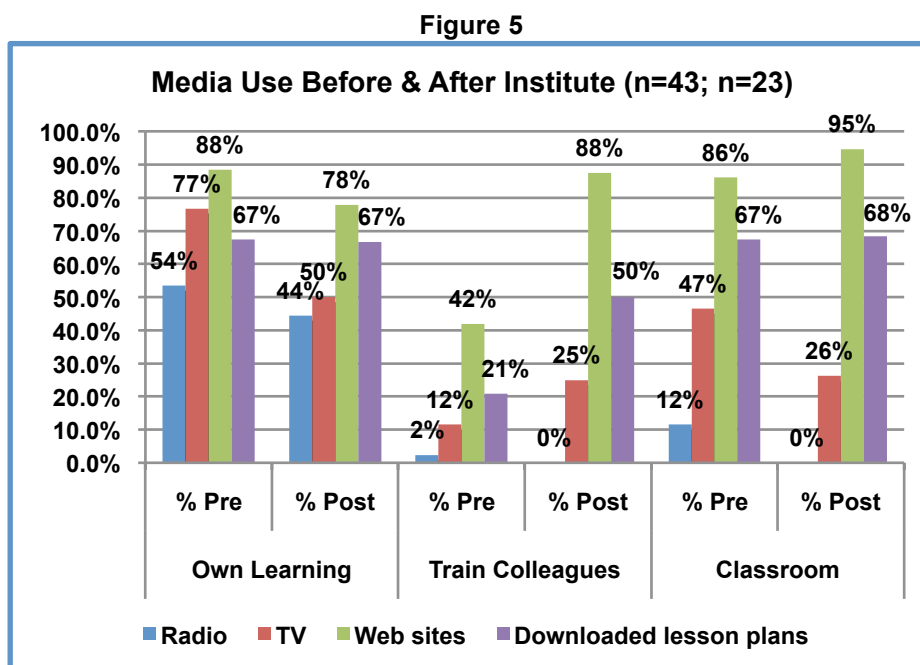
Given the small number of responses, especially for the Follow-Up Survey, this comparison must be interpreted cautiously. The clearest conclusion one can draw from it is that there was a definite increase in the use of multiple media to train colleagues after the Institute.

KQED/*QUEST* use. As Figure 6 shows, prior to participating in the Institute, just over half (n=22) reported using KQED media for educational purposes, and a majority (68.9%) were familiar with *QUEST*. While most were familiar with KQED and *QUEST*, only a minority had used various types of *QUEST* content, particularly with students (14%).

Figure 6

Familiarity with QUEST (n=43)

Category	% Participants
Viewed QUEST web site	69.8%
Heard of QUEST	69.8%
Watched QUEST TV	37.2%
Accessed QUEST video	32.6%
Listened to QUEST radio	20.9%
Used QUEST with students	14.0%
Accessed QUEST audio	11.6%
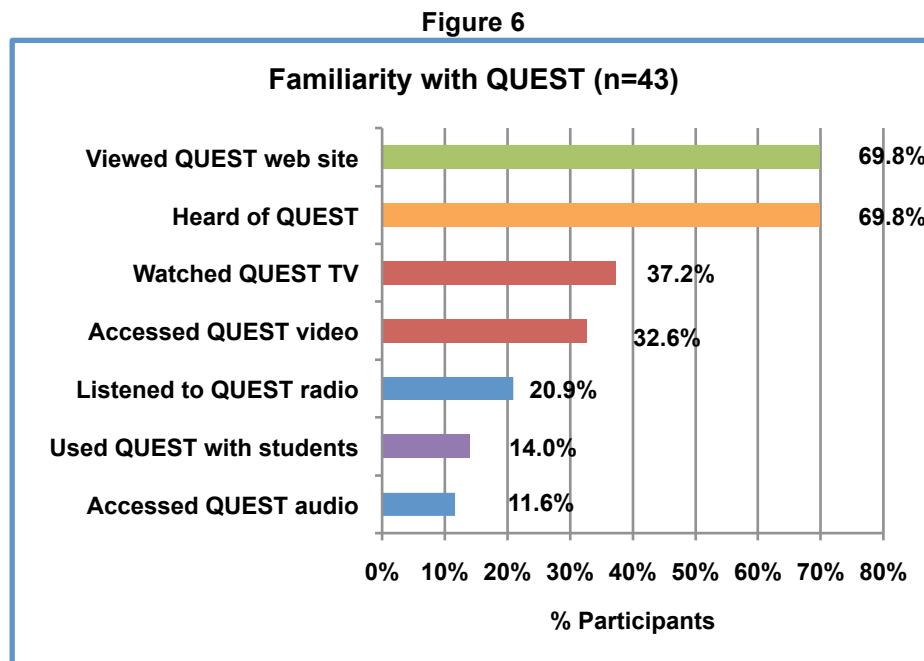
In the Follow-Up Survey, participants were asked about the amount and context of their *QUEST* media use. As Figures 7a and 7b on the next page show, participation in the Science Education Institute and Program did increase the Program Educators' use of the media and technology. Over the school year, the Educators who responded to the Follow-Up Survey used the full variety of *QUEST* content and resources for their own learning, in their classrooms, and to train colleagues.

Across contexts, the highest reported use was for streaming video. This result corresponds with data gathered in other *QUEST* media use studies indicating that educators find video pieces to be the most useful. Given this data, it is particularly significant to note that these Program Educators used *each* type of *QUEST* media and technology they learned about during the Institute in their classrooms and for their own learning.

Figure 7a

Context of QUEST Media Use (n=23)

	Radio	DVD	Streaming video	Blog
Own Learning	26%	17%	39%	22%
In Classroom	22%	17%	57%	9%
Train Colleagues	0%	0%	22%	4%

■ Own Learning ■ In Classroom ■ Train Colleagues

Figure 7b

Context of QUEST Media Use (n=23)

	Explorations	Ed guides	Flickr	Teachers' Domain	iTunes
Own Learning	17%	13%	22%	22%	17%
In Classroom	22%	13%	13%	30%	26%
Train Colleagues	13%	4%	13%	4%	0%

■ Own Learning ■ In Classroom ■ Train Colleagues
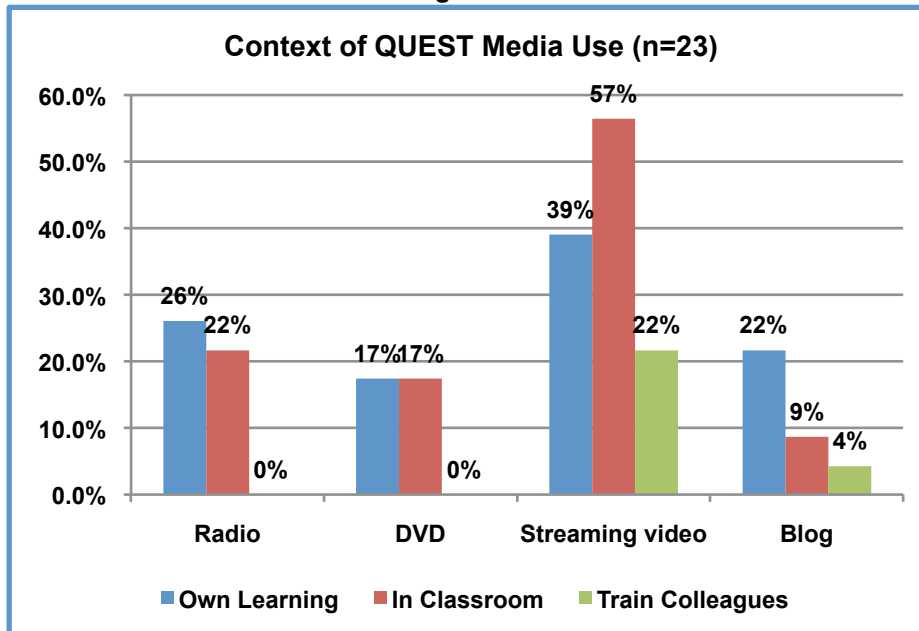
Outcomes on Practice, Skills & Knowledge

While the previous section presented an overview of Educators' media use, this section explores Educators' assessment of how participation in the Institute and Program affected (1) their media and technology practices, skills and knowledge and (2) their students' learning and engagement.

Educators. Corresponding with their expanded use of media in their classrooms reported in the previous section, the majority of Educators felt that participating in the Institute and Program had changed their use of both *QUEST* (M=3.61; 5 point scale) and general (M=3.05) media. In fact, more than half of the Educators reported that the Institute changed their *QUEST* media use moderately or quite a bit (See Figure 8.).

Figure 8

Change in Media Use (n=23)

Category	Not at all	Very little	Somewhat	Moderately	Quite a bit
QUEST Media	4.3%	8.7%	30.4%	34.8%	21.7%
General Media	9.1%	13.6%	50.0%	18.2%	9.1%
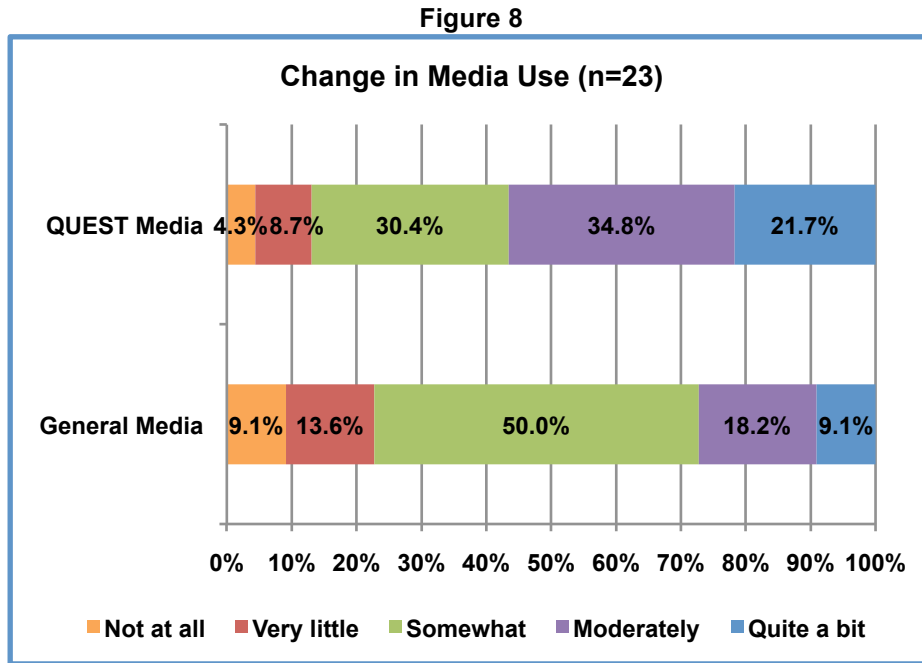
In the Follow-Up Survey, Educators were also asked why and in what ways their media use changed as a result of participating in the Institute and Program.

Figure 9

Change in Knowledge (n=23)

Category	Not at all	Very little	Somewhat	Moderately	Quite a bit
21st Century Skills	8.7%	13.0%	52.2%	13.0%	13.0%
Using Media	4.3%	4.3%	43.5%	39.1%	8.7%
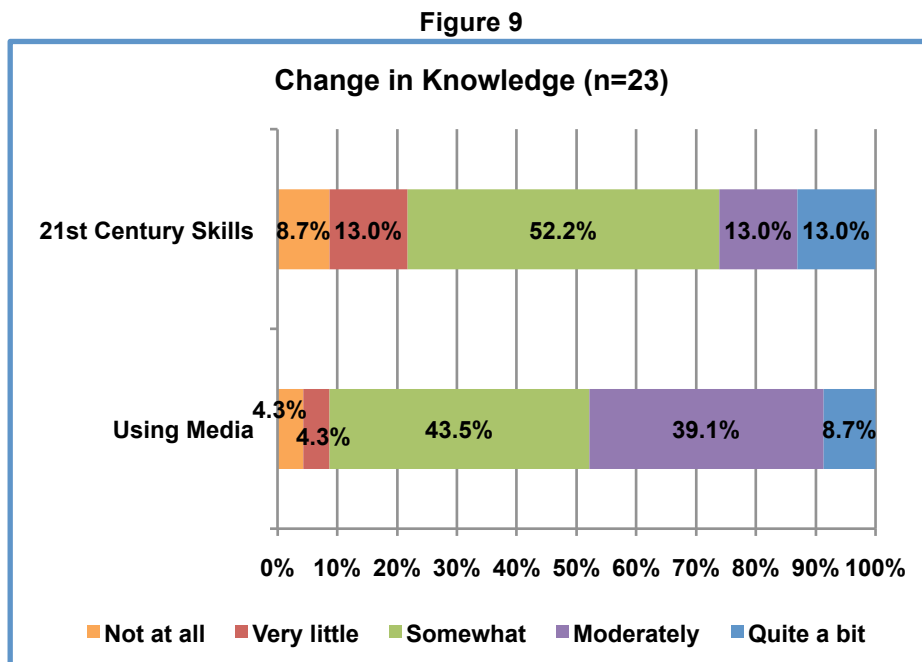
As Figure 9 above indicates, Educators felt that the Institute changed their knowledge of how to use media in the classroom (M=3.43; five point scale) and 21st Century skills (M=3.09). Nearly half (47.8%) felt their knowledge of how to use media changed *moderately* to *quite a bit.*

Educators who said their knowledge had changed *somewhat* to *quite a bit*, commented that they gained new resources, skills, and creative ideas for using media with their students and that they felt inspired and encouraged to do so. Some of their comments included (See Appendix C for all comments.):

> *I learned new applications to use with students. It encouraged me to try new technologies. The process of creating a lesson using media was simplified and I could incorporate it into future lesson plans.*

> *The QUEST Science Education Institute showed me a lot of new and creative ways to use media and technology in my classroom. I also learned a lot of new ways to use media and technology in my classroom from other students in the institute who shared their experiences.*

These Educators learned both from the Institute content and from each other – two primary goals of the Institute and Program. Many Educators incorporated this newfound knowledge into their classrooms. As with the quantitative data, Educators' descriptions of their favorite or most successful uses of *QUEST* showed that they implemented a wide range of media, including podcasts, blogs, videos, Explorations, and digital storytelling. Here are a few examples (See Appendix C for all comments.):

> *I had a classroom BLOG and I used QUEST Blog and video as articles that the students could read or watch and BLOG on.*

> *My most successful use of QUEST was the use of a radio segment, for which I types up a transcription and which I then played for students - as a model for how to do current event projects.*

> *I loved showing short segments of QUEST videos it gave the students another way to access the information and brought up local concerns. The water quiz was a real hit.*

> *The most successful experience I had was showing my students the resources, and giving them the opportunity to choose stories/ topics that interested them, to review and summarize them on their own time as part of building a portfolio.*

Students. Meeting a number of the *QUEST* team's goals, Program Educators found interesting and useful ways to incorporate *QUEST* media and the skills they learned at the Institute in their classrooms. Ultimately, both the *QUEST* team and the Educators wanted this media use to have a positive affect on students' engagement and learning.
Thus, Educators who used *QUEST* in their classrooms (n=18) were asked to assess these student outcomes. As Figure 10 below demonstrates, Educators did believe that the use of

QUEST materials had an effect on student learning (M=3.22; five point scale) and engagement (M=3.67).

Figure 10

Peceptions of Effects on Students (n=18)
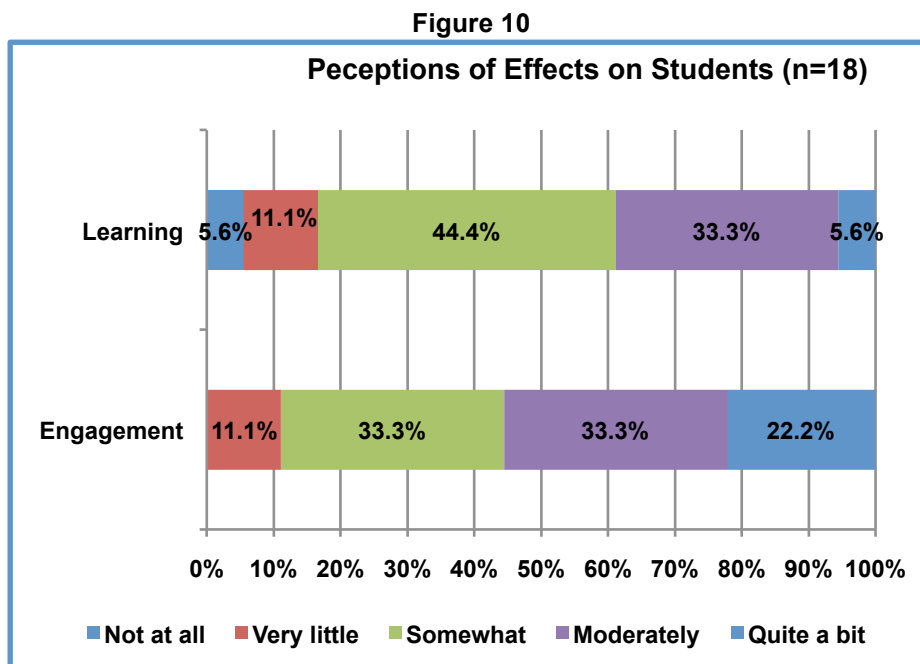
Among Educators who felt their students' engagement was affected *somewhat* to *quite a bit*, the most common reason was the local content provided by *QUEST*, the ability to bring the science topics *closer to home*, as one commented. A few felt that the "cool factor" of new technology was most engaging, including one who said: *The blog was a lot of fun for the kids. Really intelligent answers. Students are always more engaged if you have graphics or video.*

While overall positive, Educators comments regarding student learning were a bit more mixed and indicated some uncertainty over what students are learning from media and technology. One Educator did not feel students retained information (based on quiz results) and another stated: *It is difficult to assess how well they understand concepts by watching videos, but I know it helps keep them engaged and alert.* Others commented that students were able to retain information from video segments and/or that *QUEST* content clarified issues for them, for instance: *The video Chasing Beetles, Finding Darwin fit in perfectly with our evolution unit and really clarified the effects of geographical isolation and how natural selection can lead to evolution.*

Of those who did *not* feel that learning and engagement were increased, one Educator commented: *I didn't connect the QUEST material with specific learning outcomes; need to do that better in future.* This comment may suggest that student learning depends on the ways in which new media and *QUEST* materials are incorporated into lessons. As with any lesson, media content and activities need to be tied to specific goals and/or learning outcomes. All Educators who used *QUEST* felt that it added value to the classroom (M=4.52; five point scale), and 62% felt it did so quite a bit. Some Educators' comments support the idea that it

is important to consider how media can be incorporated to add value to the classroom, for instance (See Appendix C for all comments.):

> *Media doesn't replace traditional methods of instruction, but it can supplement it. Media can add interest to a topic or bring in real world examples. This is what makes QUEST media so powerful, the examples are real and local. The kids can relate. (which is why I hope to use more of the QUEST materials in the future!)*

> *Media has to be used actively, not passively (ie, plug in a video and hope kids learn vs guided questions and discussion of topic and video). When used actively, very high value, unfortunately tendency is to use passively with students to give teacher time to get ready for next part of the lesson.*

Conclusions

Overall, the 2008-2009 *QUEST* Science Education Institute and Program met its goals of increasing knowledge and use of digital media and *QUEST* resources in science and math classrooms. Program Educators gained new skills and knowledge, shared them with colleagues, and incorporated them in their classrooms.

While these data are quite positive, they may have been strengthened by a higher response rate to the final survey. It is expected that numbers of participants will go down over the course of a year-long program. This program had some difficulty from the start because a number of Educators were unclear of the commitment from the beginning. The *QUEST* team worked to resolve this issue immediately, but it may have contributed to some drop-off in participation toward the end of the school year.

There are a few areas that the *QUEST* team may want to address in future programs and initiatives. For instance, throughout the Institute and supplemental workshops, Program Educators expressed the desire for more examples and ideas for how to incorporate media, a set of best practices. Educators' comments and some of the data on student learning indicate these best practices should include ways to assess new media and 21st Century skills implementations and how and when they can be incorporated in meaningful and successful ways.

The *QUEST* team is aware of this issue, and developing these examples is an ongoing goal. To that end, REA is also in the process of completing a series of case studies to provide in-depth information on how educators use *QUEST* materials, problems they may encounter, and the effects on their students. This study includes a number of Institute Educators, and that data will be presented in a later report.

Access to technology in the classroom remains a significant issue that cannot be addressed by KQED alone. To help address this issue and to achieve buy-in from participating schools,

the 2009-2010 Institute includes district-level participants and larger teams from a smaller number of school districts.

Appendix A: Future KQED QUEST Trainings

In the Follow-Up Survey, Educators were asked what types of training opportunities and events they would be interested in attending in the future. This Appendix presents their responses.

With respect to the content of future trainings, participants showed the most interest in digital storytelling (n=16), followed by other PBS resources (n=12). Suggestions for other training content were: anything on Macs, blogging, and projects ready for implementation.
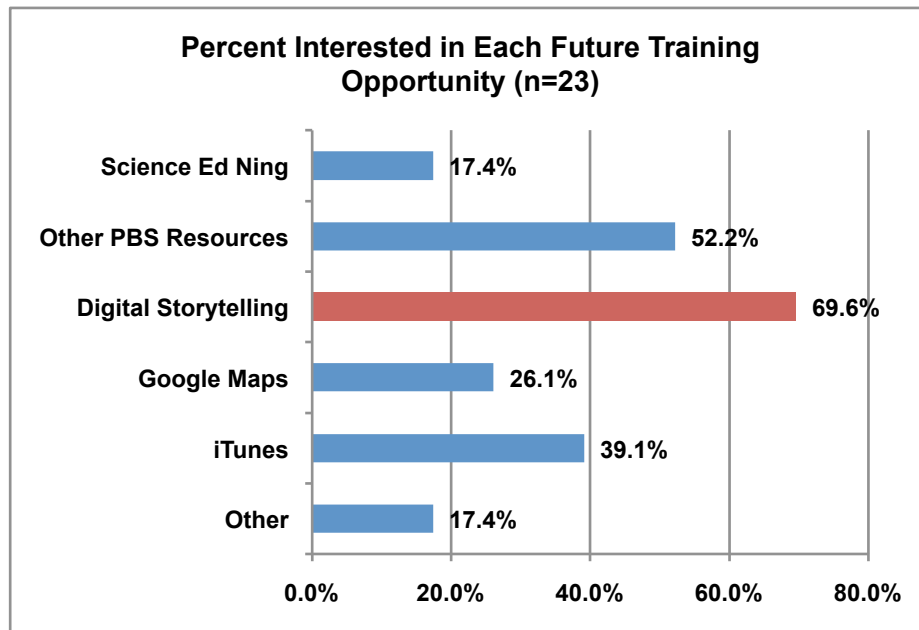
As the next figure shows, Educators' interest in training formats was spread pretty evenly among weekend, weekday workshops and webinars, with weekend workshops selected by the most participants (n=11). Of note, SMCOE and ACOE respondents gave opposite responses to this question. That is, SMCOE Educators preferred weekday workshops 2:1, and ACOE Educators preferred weekend workshops 2:1. Among the few "other" suggestions, one respondent wanted summer trainings.

Percent Interested in Each Training Format (n=23)

Format	Percent
Weekend Workshop	47.8%
Weekday Workshop	43.5%
Webinars	39.1%
Other	13.0%
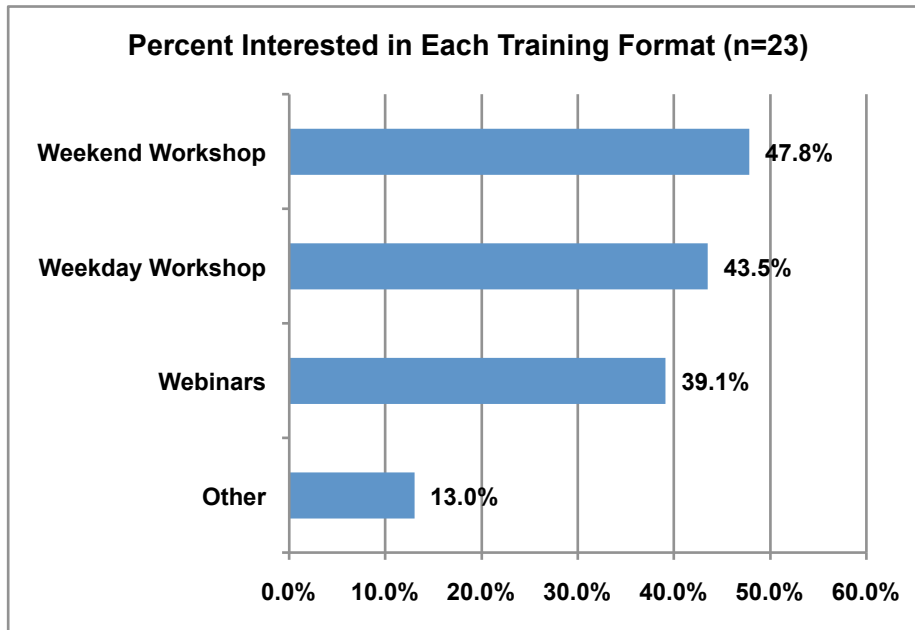
More participants (n=10) were interested in a mid-year sharing than in any other type of future event (See Figure 4 below.). This number includes just over half of ACOE Educators (n=7) but only 30% of SMCOE Educators. The top preference among the SMCOE Educators (40% selecting) was for a *QUEST* screening and producer Q&A.

Percent Interested in Each Future Event (n=23)

Event	Percent
Mid-Year Sharing	43.5%
KQED Tour	21.7%
QUEST Screening	30.4%
Other	8.7%
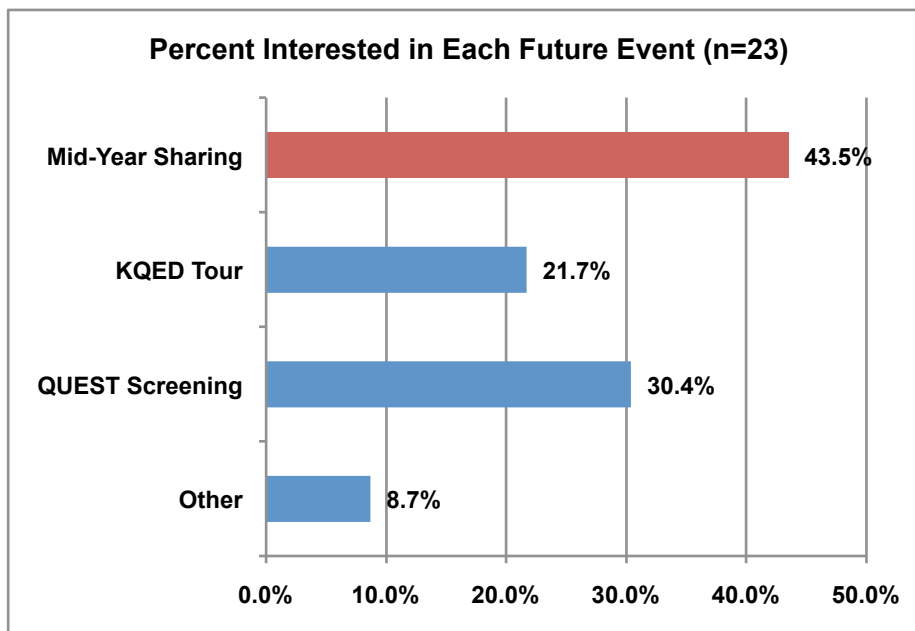
Strategies. In the Follow-Up Survey, participants were asked for suggestions on how to keep educators engaged in professional development activities. Their suggestions included:

- Immediate practice – Several participants suggested allowing time for implementation and following along (on own laptops) during workshops.

- Practical suggestions – While a couple of Educators stressed "innovative" ideas, more wanted "practical" and "classroom ready" suggestions; that is, something they could implement immediately with their students.

- Scheduling – Five participants mentioned the importance of outlining specific dates of workshops and events (preferably for the whole school year) as well as requirements for participating. One suggested parceling out a stipend with specific amounts for each training, survey, etc. One also mentioned that teachers expect their day to end at 3 pm.

- Support and connection – Several participants commented on the importance of the support they received from Jessica (particularly with respect to the ideas they were most interested in trying), as well as events like the mid-year sharing to "re-energize" them. One thought personal emails were a more effective communication tool than the Ning.

Pre-Institute Media Use

In the Background Survey and Media Diagnostic (n=43), all but two participants said that they download educational materials from the Internet. When asked about the types of materials they download for use with their classes or programs, the majority of participants reported downloading PDF files (n=40), Word documents (n=36), and video files (n=35). Less than half typically downloaded audio files (n=17). Most participants also reported that they had the capacity to watch videos online at home (n=40) and at school (n=38).

Post-Institute Media Use

Own Learning (n=23)

Category	Percentage
iTunes	17.4%
	21.7%
Flickr	21.7%
	13.0%
Exporations	17.4%
	21.7%
Streaming video	39.1%
	17.4%
Radio	26.1%

(x-axis: -10.0%, 10.0%, 30.0%, 50.0%)

In Classroom (n=23)

Category	Percentage
iTunes	26.1%
	30.4%
Flickr	13.0%
	13.0%
Exporations	21.7%
	8.7%
Streaming video	56.5%
	17.4%
Radio	21.7%

(x-axis: 0.0%, 20.0%, 40.0%, 60.0%)

Train Colleagues (n=23)

Category	Percentage
iTunes	0.0%
	4.3%
Flickr	13.0%
	4.3%
Exporations	13.0%
	4.3%
Streaming video	21.7%
	0.0%
Radio	0.0%

(x-axis: 0.0%, 10.0%, 20.0%, 30.0%)

Appendix C: Open-Ended Responses to Outcome Measures

How did the Institute change your knowledge of using media (those answering somewhat to quite a bit)?

By collaborating with a person not in my content area, it gave me a chance to think about how to use media cross-curricularly.

Creation and use of wiki pages and Google maps.

Custom user Google maps were new to me.

Definite improvement in my last field trip using QUEST videos and workshops. This was my single focus this year and it was a dramatic improvement.

Great ideas with google maps.

Helped me get more comfortable using media and showed me where to get great content.

I already used web sites such as Teacher Domain. I did not know about the podcasts from QUEST, which are great.

I have learned how to use technologies like podcasting and downloading video clips to a folder to be used when I choose.

I learned new applications to use with students. It encouraged me to try new technologies. The process of creating a lesson using media was simplified and I could incorporate it into future lesson plans.

I learned to use pbwiki, flikr, and blogging in the classroom. I was able to use an activity from another teacher at the institute with my own content to have a digital final project.

I think that next year I can make use of Google maps in Earth Science.

It did show me new ways to use media. These were ideas i already had, but it helped me implement it. Through this workshop I got inspired to try a lot of new things with my students.

It encourages me to use media in the classroom, enabling me to be creative so as to integrate it in the curriculum.

It provided material with a local connection.

It showed me many resources I never knew about that came in handy for my class. I was not able to incorporate everything I could but I plan on adding pieces here and there.

My ideas changed most in the form of what students can do with media in the classroom. We introduced wiki pages and the use of google maps in the classroom, which I felt was a great addition.

showed me that it was relatively easy to use media, gave me access to some specific media tools and support for designing and implementing activities.

The QUEST Science Education Institute showed me a lot of new and creative ways to use media and technology in my classroom. I also learned a lot of new ways to use media and technology in my classroom from other students in the institute who shared their experiences.

How did the Institute change your knowledge of 21st Century Skills?

Those answering not at all to very little:

I am already a believer.

I am committed to using media in the classroom - so I was already fairly savvy and this did not really increase my knowledge of 21st century skills.

Those answering somewhat to quite a bit:

Again it inspired me to try more of these 21st Century skills. And gave me knowledge to implement them.

Again, they showed me things I never knew about.

I am knowledgeable regarding resources I was not aware of.

I understood the skills - and made the links at the institute. This was more difficult to connect in the classroom (aside from using the media) b/c we felt that it was something the department should buy into if we were moving forward with it.

I would say it expanded on them. I am currently in a MLIS program and am constantly interacting with emerging technologies - QUEST built on that experience and helped me use my new skills in a variety of ways.

It broadens my knowledge of 21st century skills, allowing me to learn new strategies to make teaching be more dynamic.

It is very apparent that students communicate very differently today then 10 or 20 years ago. I still believe it is important to teach student's communication but through more interesting mediums.

It provided ideas for using Google maps and Flick in a classroom context.

It showed me a lot of new ways to use 21st Century skills in my classroom that I didn't know how to use before.

It showed me how blogging can be used in the classroom, although I don't know that I am likely to do much of it.

more options for students to create and/or manipulate content online.

Showed me that other teacher are trying to incorporate this.

Students enjoy and respond well to technology in the classroom.

Wiki pages and Google maps

Workshops are still a little too fast for me. I need more time to try stuff out before moving on. I'm pretty slow.

What was your favorite or most successful use of *QUEST*?

Before the end of the school year, I gave a major project on the creating a powerpoint presentation to show how math, specifically the course that they are in (Algebra II, Geometry, Algebra A), is related in everyday life. Each group focused on a specific field, such as in sports, amusement parks, in business, etc. They use the web to search for information and graphics to make their presentation become more enriched.

Environmental Videos that were downloaded as podcasts on itunes

How to use podcasts as a teaching tool.

I had a classroom BLOG and I used QUEST Blog and video as articles that the students could read or watch and BLOG on.

I like to download the videos so that I can use them for enhancing and applying the topics we cover in class.

I loved showing short segments of QUEST videos it gave the students another way to access the information and brought up local concerns. The water quiz was a real hit.

I've sent you info on this earlier, but briefly: I used the Sibley Volcanic Regional Preserve video to build a better field trip. I used it with the parents and students.

making maps (google maps)

My most successful use of QUEST was the use of a radio segment, for which I types up a transcription and which I then played for students - as a model for how to do current event projects.

Our connections at school are too slow for streaming - even the downloads are very slow and cumbersome. I did use the QUEST DVD on several occasions

QUEST explorations were interesting. I got a good response from my students for some of them. Other QUEST explorations lacked items that caught students' attention.

Showing the QUEST Digital storytelling videos that were made by teens in San Francisco was a great way to open a process of teaching digital story telling to a group of students.

Some great videos, especially Chasing Beetles, Finding Darwin. I also found a few great activities at the Teacher Domain site.

The most successful experience I had was showing my students the resources, and giving them the opportunity to choose stories/ topics that interested them, to review and summarize them on their own time as part of building a portfolio.

Use of video segments to brings in local connections to science standards.

Using the teacher domain resources for my class regarding conservation of our water resources.

We did a series on Mars and I use a number of the Mars QUEST Videos: http://science.discovery.com/videos/mars-QUEST-for-life-intro.html

We shared the ""State of Thirst"" video segment with our teacher group and used the media literacy resources to show them how to incorporate this into a lesson with students.

How did *QUEST* materials affect student engagement (those responding somewhat to quite a bit)?

As mentioned earlier, having current, local events to share with students was more engaging than sharing stories from other places.

Because it was local footage and local scientists, so it made a nice impact.

I observed that all of the students in Algebra A, the lowest performing 9th graders, were on tasked when they were asked to explore the planets of the solar system. If they have difficulty following the guidelines given, they asked questions for clarification and guidance.

I observed that students were more engaged when they could see how a topic applies to everyday life.

I used the Science of Big Waves in Physics. Truthfully - it was an interesting diversion - ""cool"", but lacked real depth for Physics students. I will use it again.

I was able to emphasize the Bay Area connection with science issues.

I've only begun to use it. My students were well aware of my use of the Sibley resource and its connection to geology careers. Still have quite a way to go on this.

Now if I am looking for science content QUEST is one of the first places I look.

Students liked gaining a new skill, they did not like having another assignment.

Students were focused on the segments.

Students were interested in the short video segments on QUEST that I found about Earthquakes.

Students were more engaged when I used QUEST materials instead of lecturing or having another means of direct instruction. I specifically used a lot of QUEST segments on California's water situation and mercury in the environment.

The blog was a lot of fun for the kids. Really intelligent answers. Students are always more engaged if you have graphics or video.

The students enjoyed the QUEST video clips, and I think that they had more of an impact since they are local stories.

This is hard for me to gauge because I work with teachers and provide professional development for them, some of them reported using the QUEST media with their students.

We watched video segments on the Don Edwards Refuge and the visuals and details brought the material much closer to home.

When we did a unit on Mars the QUEST Videos really helped a lot more that what I found within United Streaming.

How did *QUEST* affect student learning (those responding somewhat to quite a bit)?

Based on quiz scores, students did not always retain simple information from the segments.

I wasn't used routinely enough to have a major impact.

It is difficult to assess how well they understand concepts by watching videos, but I know it helps keep them engaged and alert.

Students did well on the exploration of the solar system. As such when they were given a quiz on the conversion from standard form to scientific form, vice versa, of large or smaller numbers, about 80% of the said low performing students did well.

Students have told me that the visuals helped them to remember the concepts.

Students that have access to technology at home (better than what is at school) have greater access to QUEST as a learning tool.

Students went on a virtual field trip of the New Almaden Quicksilver mine and used QUEST materials to support their learning of mercury. Students were able to retain this information and did well on a quizzes/tests.

The Mars Videos helped them develop a solid understand about Mars beyond what I could offer up with my textbook material.

The only impact I observed was that they enjoyed the video segments.

the students were able to make real life connections to what we study in the class.

The video Chasing Beetles, Finding Darwin fit in perfectly with our evolution unit and really clarified the effects of geographical isolation and how natural selection can lead to evolution.

They learned new computer skills, but did not engage in science as much as I had hoped.

they understood that wetlands were right on their doorstep and they had a direct impact on them.

We had great discussions about what a geologist does. During the field trip I had students actively ""interviewing"" rocks as a geologist might do.

What skills or knowledge did students develop when using *QUEST*?

Blogging skills...although they may have already had this.

Literacy (specifically of news segment structure, as well as general); making connections .

looking at and understanding maps, making maps, searching for pictures and pasting into a new document, giving credit for photos used.

navigating websites, using google maps, gathering information for wiki pages.

New knowledge and understand Mars with the Mars videos way beyond what I had available to me within United Streaming.

None

Observation includes all of our senses science is not rote, but a collection of observations and the ideas that spring from our observations.

The videos we found most helpful focused on how the chemistry relates to the environment, such as global warming. Videos on light were also useful to make that topic more understandable.

They learned how to navigate the site

They were directed to sites which are not only educational and informative in nature but also get some fun activities as well.

Why does using media (not) add value to the classroom?

I think that my classroom is much more engaging with the use of media. And being more engaged leads to better learning.

It connects with students who are very media-based.

It engages the students.

It is a shame the discrepancy of different classrooms (containing ""Smart Boards"" VS other classrooms with nary a computer to its occupancy.

It supports and allows additional access to information

Media can add interest to the topic.

Media doesn't replace traditional methods of instruction, but it can supplement it. Media can add interest to a topic or bring in real world examples. This is what makes QUEST media so powerful, the examples are real and local. The kids can relate. (which is why I hope to use more of the QUEST materials in the future!)

Media has to be used actively, not passively (ie, plug in a video and hope kids learn vs guided questions and discussion of topic and video). When used actively, very high value, unfortunately tendency is to use passively with students to give teacher time to get ready for next part of the lesson.

Media helps students to connect with material that otherwise feels distant to them, it engages them, it helps the visual learners, it helps to spark richer discussion.

Moderately, because it is difficult for me to assess exactly how useful it is to the students.

My students really loved the QUEST Videos. They were very well produced and my students found them very interesting. I now also play them at home on our big screen tv for my school aged children.

Not only does the use of media in the classroom supplement what I teach, but it also allows me to model to the students how to effectively use media to learn or research.

Quite a bit when students can interact with it in a meaningful way to build knowledge and skills.

Students are very visual, so seeing a video clip can clarify a concept for them. Since we cannot go on field trips or talk to experts for every unit, video clips are the next best option.

Students like working on a computer, but they still don't like to think and work on science

Teaching requires a great many avenues for imparting knowledge - whether it is different learning styles, cultural diversity in the student population, or different abilities - a great variety of teaching methods need to be employed. Computer technology has been an incredible asset.

The students are more attentive, focused, interested, motivated in everyday lesson. Media also serves as supplemental materials that enrich the curriculum.

The visual and auditory impact is much greater than just reading from a book or article.

KQED *QUEST* Educator Case Studies
Evaluation Report

Introduction & Background

For Year 3, the education evaluation focused on discovering in what ways various educators were taking what they had learned in *QUEST* trainings and workshops and what was available online and using it with their students/in their programs. REA designed a set of case studies to provide rich images of what a small number of educators were doing with *QUEST* and digital media. These case studies (1) complement the picture of educators' *QUEST* use provided by survey data and (2) offer the *QUEST* team, and their educators, real world examples of how their materials can be used with students.

These eight cases represent a variety of educators and settings. Half of the cases highlight educators who attended the *QUEST* Science Education Institute (4), and the other half were drawn from those who attended *QUEST* workshops, partner (2) and individual teacher (1), as well as those using *QUEST* independently (1). The cases are presented without identifying the educators who participated. Table A1 in the Appendix lists the educators with their affiliations and the content they used.

These educators worked in a range of settings and implemented *QUEST* resources in a variety of ways. Each case highlights a different use of *QUEST* materials, examining what the educator did, how the technology or content fit within their curriculum, what issues they faced (and solved), and how they would change or expand their use in the future. Lessons learned and larger themes from across the cases are presented in the Conclusions.

Case #1: Using QUEST Video Podcasts	
Position:	Science Teacher
School/Organization Type:	Public high school
Subject(s):	Biology & AP Environmental Science
Grade(s):	9th-12th
Tech/*QUEST* Content Used:	*QUEST* video podcasts
Data Collection:	Telephone interview

Brief Description of Use/Activity:
The teacher used *QUEST* video podcasts in her class lectures or PowerPoint slides to supplement her lessons. She used the podcasts to reemphasize, reinforce, clarify, and sum up key concepts as well as to bring relevancy and a local or different angle to what she teaches. The teacher tends to use the podcasts for whole-class presentations: "I've rarely had [students] just look at [the *QUEST* content/video] on their own. I've integrated it into a classroom presentation." At times, she also had students incorporate the video segments into their presentations to the class.

Examples of Use:

- *State of Thirst: California Water Future* – The teacher used this video in a biology class during a unit on water and resource use. She showed the video after students completed a lab calculating water use for themselves, their school, family, town and the state of CA. The *QUEST* video "gave them the current take on what they did. It's supplemental, it reinforces, and brings another angle on what I taught."

- *Marine Protected Areas* – The teacher integrated this 9-minute video piece into a PowerPoint presentation on fisheries and fishing for AP Environmental Science class. "It's not a flat slide or picture. It's live action. You can see under water. It's a good grabber, too."

The teacher also used other videos, including *Ice Age Bay Area, Frogs in Decline, What's Killing the Sea Otters,* and *Stem Cell Gold Rush* to supplement other units.

Context of Use:
Environment. This educator taught AP Environmental Science for juniors and seniors and college prep Biology for freshman and sophomores at a predominately white school. She mainly used the *QUEST* iTunes video podcasts in the AP Environmental Science class because the *QUEST* content fit better with that subject.

Technology. This educator had been teaching for over 20 years. She was very comfortable with technology and believed that she had more experience with and access to technology than most teachers. This teacher was highly motivated to used technology. While the school did not have the funding to provide technology resources, the teacher proactively acquired technology through grants. In addition to an LCD projector, she has been able to get both desktop and laptop computers for her classroom.

Prior to discovering the *QUEST* podcasts, the teacher thought she had used some of the *QUEST* segments in her class; however, the availability of the digital media podcasts facilitated her use of the *QUEST* content. The podcasts offered higher video quality and seamless integration on her computer. In addition to *QUEST* content, the teacher incorporated a variety of other media – from PBS programs to YouTube videos. She believed that relevant, live videos "grab students' attention."

Motivation and Goals:
Why QUEST? The teacher thought she first found out about *QUEST* through a family acquaintance who was involved in editing it, but she also kept track of KQED offerings. She was already familiar and comfortable with the iTunes technology. This educator liked that she was able to subscribe to the science video podcasts and the automatic updates—that new *QUEST* podcasts were automatically added to her computer. She also liked being able to look at a menu of all the available podcasts and choose which ones she wanted to use. She described them as easy to access and use, high quality, digitized, and free.

Additionally, the teacher used the *QUEST* segments because of they were concise in length, current, topical, and local. She found that the *QUEST* segments were easy to incorporate into her existing curriculum and did not require much prep time: "What's been beautiful is that [the *QUEST* videos] do fit very well... The nice thing is that it doesn't take a lot of preparation." She chose to use the *QUEST* video podcasts over the other *QUEST* technology due to limited time: "What I can make time for is finding a good clip to illustrate something I want to teach."

Goals of Use. This educator used the video segments to supplement her lessons or as a summation piece for students: "Because both of those subject areas [Biology and Environmental Science] are growing exponentially knowledge-wise, having up-to-date information and video and short clips is great." More generally:

> "I like to show them towards the end of a unit to tie all the bits of pieces, concepts, and skills that I've done. It's a nice final wrap up, putting everything together in a piece that's locally based and recent. It's a nice summation for students."

Student Engagement and Learning:
The teacher found student engagement to be high throughout the class when she showed the *QUEST* podcast videos. She attributed this engagement to the fact that the videos were short, current, relevant, and local. "It's another way of learning. I can show it on the big screen, so kids really tuned into it."

The teacher did not directly assess learning from the *QUEST* podcast videos, since the videos were used as supplemental pieces. Even without directly assess student learning, the teacher thought that they definitely helped with student learning:

> "I usually showed them at the end of teaching a particular concept or lesson, and they were a great finale – taking what they had learned and applying it to a local or current situation."

Problem-Solving/Issues:
The main barrier to use that the teacher faced was limited time:

> "Time is big. Our curriculum is really full, and we move pretty fast...I would want to use more of them, and I just ran out of time...Since I already have a lesson, and the school year and school day doesn't get any longer and you want to add something in – you have to take something out or replace something. And, I was supplementing, so sometimes it's hard to make time for that."

Besides time constraints, limited student access to fast-enough Internet connection prevented the teacher from being able to use the *QUEST* video podcasts outside of the classroom, such as asking students to watch them at home or as extra credit. The teacher also noted that the content of the *QUEST* segments ("half of the pieces are environmental science related") did not allow for as many opportunities for her to use the segments in her Biology class. The teacher did not encounter any technical problems, given her high level of experience with technology.

Future Use/Changes:
This year was the educator's first using *QUEST* video podcasts, and she definitely plans to continue using them, incorporating new pieces (such as *World's Most Powerful Microscope)*. She will be teaching a course on 9th grade Earth Science (for students who may not be "as motivated about school" or college-bound), and she hopes to use videos, such as *Northern Lights*, in that class.

In the future, this educator might try using the videos at the beginning of lessons as "grabbers" to pull students in, "so do it backwards: here's an issue and here's the topic, and use it to get their attention. So, in this class where I'll have less motivated kids, I may use it that way. Previously, I've been using it with pretty motivated kids, so I didn't need to grab their attention as much."

General Comments/Other:
In terms of suggestions for future *QUEST* video podcasts and the podcasts in general, the teacher preferred the higher-level segments versus some she found a bit "dumbed down" because "I can always help explain it, rather than something that's low level. I think kids like to learn and they want to be stimulated." She would like to see even more pieces available that feature local institutions and researchers and have a biotechnology focus, particularly since so much is happening with biotech locally. She felt that seeing what local

institutions were doing was good for the students and that local researchers provided role models.

The teacher had already recommended the *QUEST* segments to a few other science teachers but was concerned that other teachers do not know about this "great, free" resource. She suggested that KQED try to get the word out about *QUEST* and the video resources and mentioned ideas for doing so, such as posting information in (1) the National Science Teachers Association monthly newsletter (NSTA Reports) or the NSTA website resources section, and (2) the California Science Teachers' California Classroom Science bulletin that goes out to all science teachers. She also mentioned having a booth at the California Science Teachers conference or a presentation at Bioforum at the California Academy of Science.

Lastly, the teacher expressed how thankful she was to have the *QUEST* resources and noted how unique they are:

> "I just don't want them to end. … It's just nice to have this continual source of good quality, science educational clips. … I'm just really appreciative for the resource because it's excellent. It's really usable, kids really like it, and it's great and free. … It's a niche that I haven't seen anything else like it, and I'm usually pretty up on resources. It's unique. You go look into a video catalogue, and maybe you can get a Nova for $20, but it's an hour, or another DVD is $99 or more."

Case #2: QUEST *Fridays*	
Position:	Science Teacher
School/Organization Type:	Public high school
Subject(s):	AP Environmental Science
Grade(s):	11th-12th
Tech/*QUEST* Content Used:	*QUEST* video podcasts
Data Collection:	Interview

Brief Description of Use/Activity:
The teacher used *QUEST* video podcasts in his AP Environmental Science class to supplement his lessons. They fit in with existing articles, case studies, and other materials he was already using to supplement the curriculum. Approximately every other week, they had "*QUEST* Friday" in which the students watched videos related to the course material they had covered in the past two weeks and then had a discussion about them.

Context of Use:
Environment. This educator taught Science at a large high school in a residential area of the North Bay. He used the *QUEST* video podcasts in his AP Environmental Science class because the *QUEST* content fit best with that subject. This educator had been teaching for 7 years. He was comfortable with technology, and he attended the *QUEST* Science Educator Institute.

Motivation and Goals:
Why QUEST? The teacher developed this use of *QUEST* during his attendance at the *QUEST* Science Education Institute. He liked the *QUEST* content because it was short, relevant, and most importantly, local. His found that his students could connect with this local content:

> "The images, the sound, the scientists were from local universities. They were from the drives they've taken to Berkley, or the roads, or the vacations they've gone on, or however they got to their relatives. They could recognize the sights and sounds and everything."

Goals of Use. The teacher also found video to be a medium his students were most accustomed to, and he felt that the *QUEST* videos could capture their attention in a way that traditional classroom materials could not. Videos were a way to *show* his students something they had been reading about, discussing, and doing labs on:

"If our audience was 15, 16, 17 year olds who were already used to videos, multimedia visuals, and sounds that are part of their world, why not find something to bring a part of their world into the classroom, to make it even more real for them? So that was my ultimate [goal], that's what I was thinking. No doubt videos in some ways motivate and inspire a lot of the kids to learn some stuff."

He thought the *QUEST* content was "a nice addition to our curriculum" and allowed for "deeper discussions and understanding of topics."

Student Engagement and Learning:
This teacher used the videos in a similar way to how he incorporated supplemental articles and case studies that the students read. He led discussions that would encourage the students to think about the content and make connections. He felt that *how* the videos were used was the most important factor:

"Assuming the videos are well made—and they are well made in terms of *QUEST*—I think what you do with it is just as important, if not more important. … I think the students took away that a lot of the issues we talk about in the classroom, or in the book, or globally are also very similar to the issues they're experiencing in northern California. So I think they made a connection to their own lives and to their own backyard. I think that was nice."

Regardless of medium, he encouraged his students to critically analyze the messages and not just absorb the content. With respect to the *QUEST* videos:

"We talked about how it's being presented, and who's being interviewed and who's not being interviewed, and those were some of the discussion points that we had. Whether or not they agree with it, disagree with it, major points, they made the connection from the video to their own learning, to their curriculum."

The teacher did not directly assess learning from the *QUEST* podcast videos, since the videos were used as supplemental pieces. However, students could and did cite examples from the *QUEST* videos in assigned essays on various topics.

Problem-Solving/Issues:
This teacher did not have high-speed Internet access to stream or download the videos in his classroom, so he did it at home. He appreciated the ease with which new videos would be automatically downloaded via iTunes.

Future Use/Changes:
The teacher plans to use the *QUEST* video podcasts again next year and will try to add another layer—blogging—to offer his students an additional opportunity for reflection. He would also like to visit some of the local sites mentioned in the video, but anticipate that to be a challenge. Nevertheless, he will consider it a successful year if he can plan a trip to just one of the *QUEST* sites. He remarked: "Now they've heard it, they've seen it on video, now they can actually walk on the path."

General Comments/Other:

Why 21st Century Skills? Given the amount of content available to students, this teacher found it important to provide his students with the skills and tools to look at content generated by a variety of people with a range of knowledge—from professionals to other students—and determine what is good, what is bad, and what to do with different pieces of content.

The teacher also stressed the importance of creating interest and starting discussions around a topic before introducing the videos. The videos were used to supplement the existing curriculum, not to replace it: "It's there to compliment an already existing curriculum—assuming it's a good curriculum—and it's there to allow the students to think, to have emotions, to react to things that are presented, to discuss, and to make connections."

Case #3: Sibley Exploration & Fieldtrip

Position:	Science Teacher
School/Organization Type:	Public middle school
Subject(s):	General Science
Grade(s):	6th
Tech/*QUEST* Content Used:	*QUEST* videos and Explorations
Data Collection:	Classroom observation, fieldtrip observation, email interview

Brief Description of Use/Activity:
As part of a geology unit, the educator used *QUEST* content in conjunction with a field trip to the Sibley Regional Volcanic Preserve. This project included pre-fieldtrip classroom preparation, the field trip itself, and follow-up discussions in class.

Field Trip Preparation. In preparation for a field trip to Sibley, the teacher presented a slideshow that integrated science content slides (e.g. a drawing of the earth's layers with an explanation) with photographs of the prior year's trip to Sibley. After the slideshow the teacher showed a *QUEST* video featuring a geologist talking about Sibley. The class ended with students passing around some rocks that they would become more familiar with in the following weeks. During another prep class, students also viewed a *QUEST* video, *The Hayward Fault: Predictable Peril*.

Field Trip. A group of twenty-five 6th grade students were taken on a hike at Sibley Regional Volcanic Preserve. Prior to the hike, the teacher gathered students and chaperones for a 10-minute introduction, which focused on: a) how to think and observe the natural world like a scientist; b) a short description of what they would see on the trail; and c) a review of the exhibit at the base with explicit connections to content covered in the classroom preparation. The teacher instructed students to "think about becoming a scientist. You are outside working and living with things…rocks. Interview the sounds you hear. Ask questions. Listen."

Context of Use:
Environment. This educator taught 6th grade Science at an East Bay middle school. REA observed one field trip, but all of the 6th grade students participated over a number of days. The *QUEST* content was used to help introduce students to the Preserve before they went on the field trip. Then during the field trip, the teacher used the *QUEST* Sibley Exploration, however, the Preserve had updated many of its markers, making the *QUEST* content a bit outdated.

Technology. During the *QUEST* Science Education Institute, this experienced teacher expressed skepticism toward the use of new media technologies in the classroom. At the same time, he indicated he was willing to give it a try. While he has taken students to Sibley in the past, this was the first time he incorporated *QUEST* content. The teacher had an LCD projector and computer in his classroom; however, he mentioned he had to download the video content ahead of time because he did not have a reliable connection for streaming in the classroom.

Motivation and Goals:

Generally, the educator finds the *QUEST* resources to be very timely and relevant which is why he was apt to use them. He noted, "They have stories about science happening <u>right now</u>." In addition, much of the *QUEST* material made connections to local attractions like Sibley.

For this project, the teacher was less concerned about students' learning content from the videos than that they began to understand what a geologist is and does:

> "The Sibley video was important to me because they had an opportunity to see a geologist talking and explaining the area we were to visit. The point I was driving at with the field trip is that the students were doing "field work" and that "field work" relies on observations and inference. … Seeing a geologist explain and talk helped the students understand the link between what we were doing and what he was trying to do. … I asked all of my kids "How does he know this is true" and they almost universally believe he learned it from a book. I asked why he would ever go to the volcano if the answers are in a book and it was a perfect transition to the difference between our field trip and our book."

The teacher commented that, ideally, he would have had an actual geologist come and speak to the students and/or lead the hike at Sibley. Since that was not possible, the *QUEST* video provided a way to connect students to the real world work of geologists.

Student Engagement and Learning:

During the *QUEST* video presentation on Sibley, the REA observer noted that student engagement waned. This lack of interest seemed to be based on a couple of factors. First, this class was the start of a new unit, and students had been presented with a great deal of new information. Moreover, the level of the video was a bit high for the 6th grade students. A few students called out that they couldn't follow the video and could the teacher "translate." The teacher asked a student to summarize a few minutes of the video and then he summarized the remaining segments.

With respect to the field trip, the teacher felt that the students were more engaged than they had been in prior years: examining the rocks and features they encountered, asking more questions and having a higher-level discussion. He felt that the *QUEST* video helped to foster this outcome.

The teacher noted that he had used *QUEST* videos in other units, as well, and he summed up the students' reactions to them this way: The kids were wildly interested, although the vocabulary of the video often challenged them. We had a great class discussion and I chalked up my first *QUEST* video experiment as a success."

Problem-Solving/Issues:
It was difficult for this educator to integrate the technology into his materials. For example, he would have liked to embed a video into his slideshow presentation but did not know how. He therefore felt like his delivery could not be seamless. "I use *QUEST* materials to supplement my material and it's not easy enough for me to do that right now." He had limited access to technology, particularly to a reliable, high-speed, internet connection. Still, the teacher commented that the *QUEST* videos were "easily accessible to myself and the other sixth grade teacher with a minimum set of equipment."

While this teacher felt the *QUEST* Sibley Exploration "was a creative and useful presentation of much of the walk my students would take," the recent updates by the Preserve rendered it less useful than it might otherwise have been. He was working with the *QUEST* Education team to update that Exploration based on his visits to the site.

Future Use/Changes:
As part of the *QUEST* Science Education Institute and Program, this educator received training on the use of Google Maps and Google Earth. He plans to incorporate those technologies into the project in the future. He also plans to use more *QUEST* videos and to try adding a digital storytelling element to the field trip. Finally, he would like to collaborate with other *QUEST* Educators, and he is thinking of putting together a package for other teachers who want to do a similar Sibley project.

General Comments/Other:
As mentioned, the level of the content and vocabulary tended to be too high for his 6th grade students, particularly for the ELL students. He suggested:

> "I will mention that I think the Sibley video uses considerable language that makes it difficult for 6th grade English Language Learners. Not only the academic words (e.g., tectonic), but words that English speakers take for granted (e.g., expansion—sometimes referred to as "tier two words"). The *QUEST* teacher resources identify the academic words, and I suggested that we might want to add words that might make comprehension a little easier for ELL teachers."

Case #4: Nature Digital Storytelling & Mapping	
Position:	Executive Director & Social Studies Teacher
School/Organization Type:	Public high school pathway program
Subject(s):	Social Studies (Environmental)
Grade(s):	11th
Tech/*QUEST* Content Used:	Digital storytelling, Google Maps
Data Collection:	Student training observation, interview

Brief Description of Use/Activity:
This teacher created a digital storytelling and Google Maps project around a series of student nature trips to parks and outdoor spaces throughout the region. Students worked in groups of 5-6 to create four distinct videos about the places they visited. The videos range from photographs mixed with student-written poems to clips of interviews, to information about the ecology of the locations.

The group created a Google Map for the final product. After uploading the videos to the project's YouTube page, the students placed their completed digital storytelling videos in the appropriate locations on the map.

Context of Use:
Environment. This educator taught in and directed a nature-oriented learning pathway in an urban high school with a diverse population of students. All students at this high school joined one of four pathways in their junior year, and many who joined the nature pathway had no experience with nature or open spaces beforehand. The program was grounded in environmental education and included outdoor fieldwork. It also contained a strong writing component and was designed to prepare students for college. As part of the program, students were taken on a series of two camping trips, two hikes, and habitat restoration outings every other weekend throughout the school year. Students learned about nature and the environment, ecology, geology, and other environment aspects of the places they visited. This theme was carried through Science, English and Social Studies classes.

Technology-Educator. This teacher attended a *QUEST* workshop on digital storytelling and creating Google maps. He developed the idea for this project from that workshop. While he had not worked with these digital technologies before, he had done (non-digital) film projects with students in his program in the past.

Technology-Students. According to the teacher, these students were comfortable with digital technologies, overall. However, this comfort level was as consumers, not as producers of digital content. Students had to learn production skills to complete this project.

Technical Support. Over the course of this project, KQED staff conducted two digital storytelling workshops and one Google Maps workshop with the students. In addition, KQED loaned the program a set of laptops for students. The high school also had a communication arts pathway from which they borrowed cameras.

Motivation and Goals:
Why QUEST? The teacher felt that *QUEST* material fit well with the curriculum he uses and appreciated the technical expertise KQED is able to offer educators who use *QUEST* materials. He commented, "We have, of course, the sponsorship of KQED so they can provide the equipment as well as technical expertise which is very, very valuable."

Goals of Use. Within the nature pathway, each class (junior and senior) completed a yearlong project that pulled together the skills and themes learned throughout the year. This educator had been searching for a new project for the juniors when he took the digital storytelling and Google Maps workshop. He wanted this project to require students to:

> "do the kind of connective thinking that makes it a truly pathway-like project that will allow them to articulate their learning, not just from one class but all three and incorporate the field experiences onto it and then also allow them to express what this experience has meant to them or how these experiences have changed them."

This educator also connected to *QUEST*'s goal to encourage diverse people to tell their own stories about the science and nature around them. He felt that it was important for his students, "to feel like they have ownership in these places too because, again, it's the whole idea of feeling like you belong in this country and this country belongs to you."

Student Engagement and Learning:
This nature pathway had traditionally placed emphasis on student writing. The teacher found that students really enjoyed creating digital stories and that the medium provided an avenue for students to express themselves in new ways. For some, this engagement came to life when they took poems they had written about their trips for English class and turned them into digital essays with music and images. Moreover, the teacher felt that this project gave students with various learning styles the opportunity to relate their experiences and learning through images and sounds and not just through essay writing.

The students also developed media literacy and media creation skills. During the second digital storytelling workshop, the KQED workshop instructor stressed to students "the whole idea of being mindful of what your words are and the images that are going with those words." The teacher observed that this led students to create better, that is, more compelling and coherent, videos than they the ones they created before the workshop.

Problem-Solving/Issues:
This project was a technically complicated undertaking with multiple components. The teacher encountered several issues when implementing this project with his students.

One issue was the timing of the project and the amount of time he allotted for completing the stories. By the time he introduced the digital storytelling project, students had already completed all of their field experiences. His goal was to have each group create four stories in the span of six to eight weeks, which upon reflection he considered overly ambitious: "You can't really be thoughtful and craft your image to your words that well if the teacher is going 'where's your next film? Are we done?'" In the end, each group was able to create three to four stories. However, the quality of the stories varied from group to group as well as within each group.

Equipment use and access created other issues. Each group consisted of five to six students who shared one laptop. Oftentimes one or two students would take charge and "drive" while the others looked on:

> "What tends to happen in these projects is that one or two people are actually the ones editing and doing it. The rest, even though they might have contributed a poem or had some on-camera face time, they're not as involved in the actual editing."

This educator wished he had included time for assessing the stories and "beefing up" the science content for the stories:

> "There were things that I just didn't catch. By the time I realized that what they said in this one part was wrong, factually wrong, the film was already made. I needed to catch that at some prior benchmark where they had to show me something. I just didn't have that this year. There were just too many things."

It can be difficult to keep groups of students gathered around laptops focused and on task. Both REA and *QUEST* staff members observed this issue during the Google Maps training session. Ultimately, this educator and the *QUEST* staff felt that while putting technology into the hands of students did create some chaos, the students' learning, engagement and final products made up for these issues.

Future Use/Changes:
The teacher anticipates continuing the digital storytelling project with his students and plans to make a series of changes to the process to improve the project. Among these changes will be:

- Advanced notice of the project and longer period of time for students to complete the stories. Students will be notified of the project before going on their field visits and will have the entire year to complete the project.

- More even use of the laptop and editing software among students within a group, including the possibility of assigning students to production roles for each story and rotating them.

- Built in stages and time for assessment, including a process and time for students to fact-check their stories before production begins.

- Involvement of the other teachers in the pathway, especially to help create stronger science content in the stories.

- Each film will have a different focus and learning goals. For instance, the science film will have a unique set of rubrics for assessing the quality of the piece: "I think it's going to have to be something where they explain a big concept, for example a sense of place of flux equilibrium, and then connect specific information from the trip to that theme."

General Comments/Other:
This educator felt that the digital technologies used in this project can be mastered fairly easily by students. However, he stressed the importance of learning the *craft* of storytelling, and he felt the KQED team's expertise in this area was especially useful: "So in other words, it's pretty easy to narrate with pictures but to do it really well I think that's where Leslie comes in and that's where Jessica comes in so that the storytelling can be rich and nuanced and creative."

This teacher felt quite strongly that his project was a success – kinks and all – because it was grounded in and made sense with his existing curriculum. When asked to think about how other educators could implement a similar project, he commented:

> "If it's a digital storytelling project about a place then the most important thing that you need to do first is make the relationship with that place so that you and your students have a connection to that place and an investment to that place without even the whole digital storytelling thing being necessary. So personally I wouldn't say start going to McLaren just because I have a digital storytelling project that I want to do now. I think the relationship to the place needs to be genuine first. It needs to be something that you develop curriculum for. It needs to be a place where you really do go with your students and you learn something. ... I don't think you could start with I want to do digital storytelling and then okay so now I'm going to go to Yosemite because I'm doing digital storytelling. I think that's backwards."

Case #5: Introducing Community-Based Stewardship

Position:	Recreation and Parks Management Professor
School/Organization Type:	Public university
Subject(s):	Community-based Stewardship and Science
Grade(s):	College (typically juniors and seniors)
Tech/*QUEST* Content Used:	*QUEST* video; plans for digital storytelling
Data Collection:	Telephone interview

Brief Description of Use/Activity:
This professor used and plans to continue using the *QUEST* video story *Lands End Facelift* to familiarize her upper-level students at a California state university with community-based stewardship, Lands End, and the National Parks. The teacher showed this video in order to energize students for a new set of courses being offered at the university on community-based stewardship, specifically one where students spend their Spring Break at a six-day field school working in the National Parks system with pre- and post-trip learning experiences in the classroom.

Context:
Environment. This educator was a faculty member in a Recreation and Parks Management Department. She taught a fairly new class on community-based stewardship that enrolled 30 college students, largely urban, with varying backgrounds and often no experience with community-based stewardship. These students spent Spring Break working in the National Parks.

Technology. The professor found out about *QUEST* through the Golden Gate National Parks Conservancy, a *QUEST* partner, and specifically found the link to the *Lands End Facelift* video in the media section on the Conservancy's website.

She described herself as a "high-end user of technology for an educator" and has used technology frequently in the past. Currently conducting field research, she has very limited access to technology.

> "In 1995, I had full Web-support for all my classes. I'm a really early adopter. … As I sit, I have no cell phone access, no TV access, and I can't pick up KQED on the radio, and I don't have Web access."

Her university department was quite supportive of technology and to providing access to students:

"Within that context my academic department has been extremely proactive – we're probably the most technologically-oriented recreation curriculum in the U.S. ... We have a full-time technologist available to a faculty of 12. We maintain four labs for our students. That's enormous. Each of the classrooms we teach in is fully mediated. My ability to embrace this stuff is based on a campus and departmental commitment, and time and money and equipment that is unduplicated...we don't have the cost or commitment barriers that some educators have faced."

Motivation and Goals:
The professor used media tools because she felt doing so was required today to be an effective, successful educator:

"The advent of YouTube and widespread availability of motion over Web is the functional equivalent of the between black and white and color print. It has just changed the game. The expectation is very rapidly evolving. ... And, flat isn't good enough, black and white isn't good enough, and text alone isn't good enough anymore, which is why I'm doing this. I'm too competitive to be as ineffective as I am with the old tools... I'm too competitive not to use the tools that are necessary to be successful. So, I'll do it because that's what going to be required."

Why QUEST? Specifically, the professor showed the *Lands End Facelift* video to familiarize her students with community-based stewardship and to motivate them to devote their Spring Break to the community-based stewardship course. The video allowed students to see the place they would work and get a sense of the importance of the work they would be doing:

"So, I'm a college professor with 30 students of varying backgrounds, varying amounts of familiarity with the area, varying amounts of personal familiarity with national parks, and zero experience in community-based stewardship. And, the place that I'm planning to take them is 189 miles from where they are. And, the class is new, and nobody's ever heard of something like this before. So, you've got all of this complexity and novelty – the ability to run even a 2-minute segment that has a young professional, who's more or less the same age as these kids, and for them to see the place where they will be and get a sense of why their work will matter. That's what these snippets do. That's pretty powerful stuff."

In addition to the students being physically distant from and unfamiliar with the site where they would be doing the field school, the professor was located off campus and was quite a bit older than her students. She considered media useful in bridging these gaps.

Student Engagement and Learning:
The teacher found the *Lands End Facelift* video to be very influential in stimulating interest, preparing, and motivating students to take part in field school.

The teacher did not assess the use of the video directly and did not use *QUEST* to drive student science content knowledge and mastery but was using it as "travel logs" and as a way to stimulate interest, "not as a substitute, but as a stimulant to get to the real thing."

Problem-Solving/Issues:
The professor had not encountered any technical problems with using the *QUEST* media. She mentioned that a barrier to use was not her ability with or availability of technology on campus, but rather her limited access to technology, given that she is in residency doing fieldwork. In addition, finding available time and time constraints is an issue.

Additionally, when discussing her anticipated future implementation of a *QUEST* digital storytelling project, she mentioned her off-campus location as a potential problem, but complemented KQED on the completeness of the digital storytelling materials and directions available on its website. She felt that students would be able to use these resources to teach themselves and each other how to do digital storytelling. Still, she realizes this project will require self-motivation:

> "But, I won't be there, so it's going to be heavily dependent on whether we can make the jump from theory to practice with these team leads. But, if we can, I wouldn't even be contemplating this if I didn't have the 24/7 passive back-up that KQED has created in its digital storytelling area."

To implement the digital storytelling portion, she also noted expected barriers of difficultly sustaining student motivation after field school ended and lack of available "backside" technical support.

Future Use/Changes:
The professor plans to continue to use *QUEST* with future classes. She plans to use the *QUEST* materials as she has been for the community-based stewardship class, and in addition, plans to use *QUEST* in an emerging class on community-based science. She will likely use the materials more frequently in the new science class than in her class on community-based stewardship.

Additionally, the professor plans to have her students create a short digital story using the tools and techniques taught in the KQED Public Lands, Public Voices workshop. One goal of the project would be for students to make sense of what they learn and experience during field school with a set of "non-text tools":

> "The traditional historic way people have made sense of nature and natural systems as naturalists has been the field journal. You go out, you write your impressions, and you make your sketches. You keep a diary in the field. This in essence could be the contemporary equivalent because there are so many more tools available to us then field naturalist ever had. But the need for people to capture information before they know what to do with it in unfamiliar systems is still an issue and is still present with us."

Through creating digital stories, the students would help the teacher prepare and instruct future students for and about field school. This would be especially helpful given the unusual teaching situation in which the professor is mostly off campus and is only able to meet with students a handful of times before they go into a weeklong field school:

> "We have to work harder to make me real, we have to work harder to make the parks real, we have to work harder to make the "What will I be doing" real…. And, this digital storytelling is just a really interesting way to deal with stuff like that, and we see that happening all over websites everywhere. People use these little short, digital stories to actually instruct."

She plans to use the digital storytelling as an alternative way for students to demonstrate understanding from field school, as opposed to their traditional research paper. While she would not directly assess these pieces, she believes they will become "portfolio pieces" students will use as they enter the job market.

General Comments/Other:
The professor expressed her appreciation for KQED and having the *QUEST* resources, noting their utility and power:

> "I'm best able to illustrate the real value of this by its absence. If KQED took the digital storytelling down tomorrow, a whole bunch of things would never be able to happen for my students. There's a chance they'll be able to happen if it stays up. If KQED's video snippets with Asha Setty were to go away, would it stop field school? No. Would it make it harder for students to be confident and to make the commitment to give up their Spring Breaks? You bet. I'm a veteran. I'll find a workaround. But these are really compelling and powerful tools that I'd never be able to put together on my own. And, now that they are there, I use them joyfully and with great appreciation."

This educator expressed gratitude to KQED for allowing two of her students to take part in its Public Lands, Public Voices workshop. She also noted that it's often hard for educators to find good resources, such as *QUEST*, due to how busy educators are:

> "There's an awful lot of good content out there and there's an awful lot of good support out there, but we're too busy to find it anymore. I wouldn't have known about [*QUEST*] if I hadn't been in residency at the parks and if I hadn't been a power user of the conservancy's website. That's too tenuous a chain."

Case #6: Media Literacy Workshop	
Position:	Academics & Professional Development
	Office of Teaching & Learning
School/Organization Type:	Public school district
Subject(s):	Science and English/Language Arts
Grade(s):	6th-12th grades
Tech/*QUEST* Content Used:	*QUEST* video; digital storytelling; media literacy resources
Data Collection:	Interview; review of training workshop content

Brief Description of Use/Activity:
These educators created a professional development workshop for Science and English Language Arts teachers. The workshop introduced teachers to concepts of media literacy and using media in science classrooms as well as the possibility of having students create persuasive essays using digital storytelling. Teachers were introduced to a number of *QUEST* resources, including content and materials for analyzing and creating digital media.

Context of Use:
Environment. These educators worked in professional development for a large and diverse urban school district. One worked with Science teachers and the other with English and Language Arts teachers. They presented this workshop within the context of an existing, year-long professional development program called for middle school teacher leaders.

Technology. These educators attended the *QUEST* Science Education Institute as part of the same team, and they developed this media literacy workshop using *QUEST* materials in conjunction with the Institute. In addition to the technical training and *QUEST* exposure they received during the Institute, these educators work in technology training for their district.

Motivation and Goals:
Why QUEST? These two educators felt that, while *QUEST* is Science-based, it touches upon social issues that should be the concern of the general population and provides a good content base for integrating literacy and science. They also liked that *QUEST* is local and that students would recognize the locations mentioned throughout the series.

Goals of Use. These educators came together for the *QUEST* Science Education Institute and for this workshop as part of a drive to promote "cross-curricular literacy and science" within the district.

> "You want to crossover content areas and not just have them explore content but also practice some skills that are of value; and definitely persuasive writing is pretty key to Science because there's scientific argumentation. ... So I think for project-based learning, I think this would be something that I would definitely recommend."

While they presented the same workshop to both Science and Language Arts teachers, these educators believed it was easier for the Science teachers to figure out how to incorporate this type of activity into their lessons because the content aligns. Additionally, a number of science educators already used or were familiar with *QUEST*. They would like to see Language Arts teachers work with Science teachers to integrate student writing with Science content.

Student Engagement and Learning:
(Only "students" were teachers in the training program.) Approximately half of the teachers who attended the Media Literacy workshop indicated that they planned to try to implement what they had learned in the next school year. While this result is encouraging, the educators expressed some frustration at this. The pair felt that teachers had plenty of time to implement it in the current school year; however, they have found that it can be difficult to get teachers to add new projects once their curriculum is set.

These educators said the science teachers responded quite positively to the *QUEST* content, particularly the episode, *Future History: Plastic Water Bottles.* This episode got the teachers interested in searching for more *QUEST* content.

Their program trained teacher leaders, and the pair felt that many of them would take what they learned at the media literacy workshop back to their fellow teachers:

> "Some people will take it back and try it in their own classrooms. Some people will take it back, try it, and present it, and talk other people into doing it. So you've got different levels of teachers in different places. And it depends on also the level of collaboration, and the opportunities they have to talk to the other people at their site."

Problem-Solving/Issues:
While these educators felt that the teachers they worked with recognized the value of media literacy, some teachers may have considered the content out of their subject area. For example, "there are plenty of social issues in Science, [but] the standards are not about social issues, they're about learning the content…. I think is what probably causes some hesitation with the Science teachers."

They also discussed the "massive divide" in technical support and availability across the district, which would be a barrier for some teachers. Many of their teachers, particularly the Science teachers, told the pair that they could not obtain access to the computer labs at school to do projects like the one presented. The labs tended to be set aside for Math and

Language Arts and/or remedial programs. These educators would like to see computers in every classroom:

> "Because if they're doing it, even once a month, they go into the lab, it's not building that flow of technology skills where they're being so comfortable with the computer that they're moving on to the learning rather than worrying about the skills of learning the computer."

While *QUEST* cannot fix this problem, these educators put forth the idea that *QUEST* could try to offer suggestions or models for how teachers could do a project in different ways/levels depending on the technology resources available.

Future Use/Changes:
These educators are considering conducting a multi-day, standalone workshop on digital storytelling, separate from the teacher leader program. The standalone workshop would attract those who are interested in the medium and the multi-day format would allow them to focus on different topics each day, such as using technology or potential types of content or integrating the project into an existing curriculum.

Case #7: Moon Phases Digital Storytelling	
Position:	Librarian
School/Organization Type:	Public middle school
Subject(s):	Computers and Media
Grade(s):	6th-8th Special Ed, ELL
Tech/*QUEST* Content Used:	Digital Storytelling; no *QUEST* content used
Data Collection:	Telephone Interview

Brief Description of Use/Activity:
This project was the first time this educator has designed and implemented a digital storytelling project with her students. This Librarian worked with a Special Ed teacher and several Science teachers to offer a digital storytelling project on moon phases to a group of eight students as way for them to earn extra credit for their Science classes or to pass 8th grade. Students were to research a specific moon phase, collect images for a slideshow, write a script narrating the slides, and record themselves reading the script.

Context:
Environment. As a first-year librarian at an East Bay middle school, this educator had previously taught computers and digital media at the school and continued to work with students in that capacity in her role as a librarian, using the library computer lab.

The decision to create digital stories was based on the equipment available—the school lab was already equipped with a library of digital images and cameras, and the Macintosh computers readily came with media production software installed. School staff members were quite supportive of this initiative and many teachers expressed interest when the educator spoke with them about the project.

Technology-educator. This educator was fairly comfortable using media and technology. While working on her MLIS, she became interested in emerging online media applications, such as wikis, blogging, and various Google web applications. Attending the *QUEST* Science Education Institute piqued her interest in creating a digital storytelling project as she had the equipment to produce stories at her school: "I had done the workshop and I really liked it. And it was really fun. When I looked at the components—what was needed—we had all of that."

Technology-students. The students who worked on this project were primarily Special Ed students and English language learners. This group of students was "high functioning socially" but had "little academic strength." Most students were accustomed to *seeing*

media in this format (digital storytelling) but had varying levels of comfort and skill in actually using the equipment and software to produce content. Some students struggled with the writing component of the project while others would get frustrated with the technology. Focusing and staying on-task was a big challenge for these students. The educator summed up student experience by saying:

> "Experience really varied. Some kids never used computers before but they were way at the end of the spectrum…all the way to kids who were teaching *me* what to do next. We did Photoshop Elements and I had never done Photoshop before but some students had, so they showed me how to use that. Some were really advanced that way."

Motivation and Goals:
With the shift toward project-based assessments, this educator felt that a digital storytelling project would be a good assessment component to add to the curriculum. She also felt that this non-traditional way of presenting student research would appeal to students with different learning styles:

> "When kids have the option to do a PowerPoint or photo collage instead of the traditional book report, they get more excited and more involved. The group we worked with was special needs, struggling with content and motivation. Using the technology helped us focus the content and get them excited about doing it."

Student Engagement and Learning:
The educator introduced the project by showing digital stories created by high school students on the KQED web site. The students were quite receptive to the stories, which portrayed kids their age.

Their digital storytelling project on moon phases was initially designed to be completed in one month, with students coming out of their regular classes and into the library lab twice a week (3 hours a week) to work on their stories. The educator did not account for "how absent" this group of students would be, as well as how long it would take them to process the information or to work independently:

> "They get distracted by the images, and that overshadows the Science content. One kid could barely write three sentences whereas another could do whole paragraphs but would get pissed off at the computer every two minutes. When you're working with Special Ed kids, it's a different ball game."

Although students had trouble focusing, they exhibited high levels of participation, excitement, and engagement while working with the technology. One of the subject teachers commented that one particular student would have a bad day in her class but would perk up once he got to the lab. Students seemed to enjoy *manipulating* content, that is, working with existing images to incorporate into their stories, rather than *generating* original content by writing and recording their scripts for the stories:

"One kid struggled with the language. Another struggled with the structure. For one kid, it was really difficult to focus. He had been in my computer class so he could go grab pictures and change the colors. When I told him to go work on his content, he'd go and add more pictures. I also had to lock the computers in front of them when I was showing them stuff so they wouldn't play around on them."

However, over the duration of the project, all eight students were able to produce work. She felt that using the technology really helped students focus on the content and get them excited about doing it. To the educator, this was a great success: "We can see they're producing, which is a huge challenge for Special Ed kids."

Problem-Solving/Issues:
In hindsight, this educator underestimated the amount of time and work it would take to pursue this type of project with Special Ed and ELL students, especially at the end of the school year:

> "Well, I think we bit off a little more than we could do at the end of the school year. Covering the content about why the moon when through phases...that took a while. We should have started about a month earlier since writing the script consumed a lot more time than was expected. One of the big challenges with this group of students is them being able to work independently."

Also, students came to the project with varying levels of technology skill, and the educator had not planned time for them to experiment with the technology. She reflected, "They need time to play with the technology. They need to play with Audacity...try recording themselves, what do different things sound like..."

Future Use/Changes:
The educator felt that the project she undertook with her students did not turn out ideally. However, she is planning to try it again, armed with the experience of this first attempt. Now that she is more aware of the abilities and limitations of Special Ed and ELL students, she is planning to adjust the project in the following ways to provide a richer experience for her students:

- Extend the timeframe for completing the stories. Students clearly needed more time to learn the various software applications and media equipment needed to create digital stories. They also needed additional time with the writing component of the project and time to learn about the content they would present in their stories.

- Complete a mini story (with about five slides) as an introduction to the project. This would introduce students to the technology and software and get them comfortable with both before embarking on a larger project with a wider range of components.

- Tackle content and technology separately. Allow students to get comfortable with the technology first and then bring in the complicated content to deepen students' understanding.

General Comments/Other:
While this educator would have liked to extend the project by having students include KQED images in their stories or pursue other projects such as blogging, she was limited by the school's network and culture. Only about half the students had an email address because parents were concerned about their children's online safety with having a personal email address. The school's network also did not allow access to Flickr, where KQED hosts a large collection of images. Also, as a librarian and media specialist, the educator did not have a Science background and would have to work with a subject teacher to develop other digital media projects for students.

Case #8: Digitally Mapping the Ecology Trail

Position:	Education Coordinator
School/Organization Type:	after-school program for public middle school students
Subject(s):	Archaeology
Grade(s):	6th-8th
Tech/*QUEST* Content Used:	Google maps
Data Collection:	In-person Interview

Brief Description of Use/Activity:

The educator designed this site-based field trip program for a local after school program. The 10-week program introduced students to the cultural and botanical uses of the plants on the Presidio's Ecology Trail. In the first half of the program, students investigated the cultural importance of these plants and discovered how they were used for food, shelter, tools, and medicine through a series of hands-on skills workshops led by outside educators. The latter half of the program focused on reflection and content creation, using computer and online applications to share students' experience. The final project was a student-created Google map that guided visitors on an exploration of the Ecology Trail through text and narrated place markers.

Context:

Environment. The program activities generally took place at the school and at a local park near the school. When they needed to use computers, they used the Teen Center at the school and worked with their staff to reserve the lab:

> "The Teen Center had six or seven computers that were fast, connected, and had the applications we needed. We were able to reserve the Teen Center during the times we needed. They really worked with us to accommodate our needs."

The educator did, however, need to use her personal laptop to record the narrations for the slideshows. She acknowledges that it may have been difficult to do the voiceovers without her laptop.

Students. The program included 12 students from a local middle school. More than half were English Language Learners who struggled with reading, writing, speaking, and listening. However, as the hands-on skills workshops and software tutorials were demonstrations, these students didn't need to have strong language skills to complete the hands-on workshops:

> "The thing that was neat was that they didn't need a lot of language because the hands-on skills workshops were working with your hands…developing new skills they didn't know…making arrows, cordage, acorn processing. There was lots of visual communication…watching the outside educators make the thing and then doing it."

The educator also noted that students were generally comfortable working on the computer: "Students are very tech savvy and enjoyed working on the computers. When I did the tutorials they couldn't wait to try it on their own."

The piece of the project that the ELL students struggled with most was the writing and recording the narrations for the slideshows: "Their stories might have been shorter and it might have taken them longer to do the voiceovers for it…but this allowed them to build their language in a small group setting."

Training. While this educator appeared to be quite tech savvy, she indicated that most of the digital media applications she used with her students were fairly new to her. While she had worked with some graphics applications in college, through her work as a classroom teacher and partner trainings with KQED and the Center for Digital Storytelling, she was able to put together the 10-week program by learning the basic functions of a range of applications:

> "Just in this year, Google mapping was entirely new to me…I learned it at the workshop with KQED. Windows Movie Maker I had never used before and iMovie I had used just a little bit before. I took a class at the Center for Digital Storytelling Berkeley and started familiarizing myself with Flickr and Picasa. So really it's all just been within this past year. And they're all really easy. I'm sure there are more advanced tricks with them but just in terms of doing the basics with them, it's pretty easy. I played with them and then wrote up the tutorials for the kids a week after I reviewed it myself."

Motivation and Goals:
The educator had always been interested in writing and the storytelling side of digital media. She had also started building a partnership with the local after school program to try out the program activity. Attending the KQED workshop and learning about KQED's work with the upcoming Ken Burns documentaries on National Parks gave her the push she needed to implement the program. Overall, the timing just worked out well.

The program was designed to meet the goals of both her organization and the after school program—to provide a meaningful outdoor learning experience and build leadership:

> "You hope that the experiences are meaningful and connected to their prior experiences at school and to the park…it's a National Park for them to enjoy. It's theirs. [The workshops are] also hands-on, it's something real that they're learning about…it sparks their curiosity about the past, connecting present to the past. [The

after school program] focuses on building leadership development and cross-cultural, outdoor education. This program provides kids with opportunities to create this map that will be viewed by other people, both about what they learned and their perspective on plants, other cultures, and skills...skills from the past and skills from today. The idea is that they are learning native Californian skills, learning to make something out of plants, and learning this digital media."

Student Engagement and Learning:
The educator found students to be "totally engaged" in the program activities, even after a long day at school:

> "They've already been sitting since 8am. It's the end of the day, they're tired, you go into the lab and they're kind of glossy-eyed when you do the tutorial. But once they're on the computer they didn't want to get off. You could hear a pin drop. They were all really focused. They were really good about sharing, rotating, and allowing other kids to take a turn on the computer. The kids were really helpful toward each other...they really liked taking ownership of what they did and were proud of these movies they made."

Also, in her experience, students do not always show up for after school programs, especially older students. In this case, though, more than half of the group showed up each week for the duration of the 10-week program.

As a former classroom teacher, the educator would like to create a rubric to assess student learning and engagement with the program. She could then use the information to provide documentation for funding agencies for future programs.

Problem-Solving/Issues:
The educator found that things generally flowed smoothly according to the schedule she had set for the program. However, she would have liked to spend more time on the writing process:

> "The time it takes to go through the writing process, this is really tight. We had 1.5 hours for them to come up with a digital story and still have their own voice and creativity within it...would have liked more time to do writing throughout so when it came time for the final project, you had been working with them as writers throughout. More reflection time, more journal time throughout would strengthen the end product."

Future Use/Changes:
The educator plans to run the program again in the summer as a weeklong summer camp program in August. She anticipates little things to change—such as the specific applications students will use, but the basic structure of the program will remain the same. The program will also be open to a range of students. Then, she would like to repeat the program with the after-school program during the school year, focusing on a different trail

and offering different workshops. For the future programs, she also plans to incorporate time at the end of each workshop for students to reflect on the activity.

Conclusions

These case studies were undertaken to provide real world examples of *QUEST* and digital media in use across a wide range of settings, projects, types of students and educators. They offer ideas for use, tips on implementation and solutions to encountered problems. They allow for the start of a list of best practices, as follows:

- *Time*. Working with technology takes time, often more than the educators planned for, especially when teaching students technology skills;

- *Access.* Access to equipment, high-speed Internet, and useful applications is and will likely remain an issue. Still, these teachers found ways to work around access issues, such as downloading content at home and borrowing equipment for projects;

- *Goals*. Technology and digital media use needs to be closely tied to curriculum and learning goals. Teachers can choose from a range of technologies and content types. It needs to be folded in logically, rather than added on.

While each case presented here offers a unique set of circumstances – level, content area, type of students, content and technologies used – some common themes do emerge. Echoing the feedback gleaned from surveys, these case study educators look to *QUEST* for high quality, local, relevant, and up-top-date content. Most appreciate the level at which the content is presented and do not want it to be "dumbed down." Still, at least one educator expressed concern that the material is too complex for some students. As with respondents to the online user surveys, these educators prefer the online/downloadable content for its convenience.

Appendix of Case Study Educators

QUEST Educators Included in Case Studies

Educators	Institution	*QUEST* Association	Content/Tech
Saum Zargar	Terra Linda HS, Science Teacher	Institute Educator	*QUEST* videos
Deb Farkas & Elliott Peck	SFUSD Learning Support & Equity	Institute Educators	*QUEST* video and resources on digital storytelling & media literacy
Sarah Rosenkrantz	Bancroft Middle School, Librarian & Media Instructor	Institute Educator	Digital storytelling
Raleigh McLemore	Bancroft Middle School, Science Teacher	Institute Educator	*QUEST* videos and Explorations
Jane Orbuch	San Lorenzo Valley HS, Science Teacher	Independent User	*QUEST* videos
Katie Ahern	Presidio Trust	Partner Workshop	Digital storytelling, Google Maps
Emilyn Sheffield	National Parks, Chico, Professor in Rec & Parks Mgmt	Partner Workshop	*QUEST* video
Conrad J. Benedicto	Wilderness Arts and Literacy Collaborative (WALC) Teacher at Balboa High School	Google Maps and digital storytelling workshops	Digital storytelling, Google Maps; *QUEST* staff for training

**KQED _QUEST_ Partners Web 2.0 Training and Implementation
Evaluation Report**

Introduction & Background

QUEST partner organizations include various Science, Nature, and Environment-focused organizations from around the San Francisco Bay Area. Each organization's use of online media tools varied—some partner web sites had a Google Map to show their location but most did not include social media tools prior to the workshops.

Workshop attendees from each organization also varied. Although KQED suggested that organizations send at least one web staff member to each workshop, workshop participants were not necessarily in a production, web, or marketing role at their respective organizations.

Workshop participants were generally aware of the media tools covered in each workshop. However, few had used tools such as Google Maps and blogs beyond a basic capacity and most did not incorporate tools like widgets and social media in their web sites.

Partner Media Training Workshops

KQED held four media training workshops for their partner organizations throughout the year. The hands-on workshops focused on using various types of online media tools to enhance organizations' web sites. Each 90-minute workshop generally began with KQED instructors introducing the media type and describing how KQED uses it. Instructors also offered potential uses for the tools and provided use cases from different sites. The latter half of the workshop often included hands-on time for participants to try out the media tools.

The workshops were typically once each quarter and covered the following topics:

- Widget Workshop, February 2009
- Maps and Explorations, April 2009
- Blogs and Web Outreach, June 2009
- Photo Sharing and Community Participation, September 2009

The following section summarizes participant feedback for the first three workshops (Widgets, Maps, and Blogs). While all partner organizations were invited to each workshop and KQED suggested that organizations send their web staff to the workshops, it should be noted that workshop participants were not necessarily in production, web, or marketing roles at their respective organizations.

Participants found the KQED media training workshops to be "useful," "informative," "inspiring," and "fun." They valued KQED's expertise with the media tools and especially appreciated hearing about different uses of the social media tools—such as Facebook and

Twitter—from other partner organizations. The following summarizes the general response from partners:

> "I really enjoyed the presentations about Social Media, and learned how each organization was tackling Twitter, Facebook, and blogs. The insight will definitely help me and our department as we move forward with our Social Marketing strategy. It was great to see how the presenting organizations managed Social Media on a daily basis."

Uses

Many partner organizations began incorporating widgets and maps into their web sites soon after participating in the workshops. Since the workshops, several organizations now have news aggregator widgets on their web sites showing related headlines and a Google Map providing directions to their organization's location. Some have extended Google Maps to create interactive maps with informative place markers to share places of interest with their users. Other organizations have started blogs on their sites and are looking into developing a social marketing strategy for their organization. Participants shared some of their efforts with the tools they learned at the workshops:

> "I have used Flickr and videos on Facebook that we learned in the February workshop and it helped us populate our "fans" page with more relevant content, so thanks for sharing."

> "The mapping workshop was really interesting. I've used that in a couple of different ways and plan to do more with it in the future. Blogs and web outreach spurred me to finally start-up accounts for us with YouTube, Flickr, etc. I hope to be able to use more of these skills throughout our web sites in the near future."

> "We will be developing an interactive map on where fossil eggshells are found around the world and eventually include the ability for others to add their specimen localities to the map as well. Each locality associated with photos and links to appropriate data that serves the research community as well as the public."

Participants found it helpful to have hands-on time during the training to try out the tools and have KQED instructors available to answer questions. Participants shared the following comments:

> "The widget workshop was very inspiring and useful because we were able to create functional widgets on the spot, and get feedback and advice from *QUEST* experts, as well as fellow collaborators. I am still using an RSS aggregation widget that I adapted following that workshop on our web site and am in the process of developing a similar widget for another group.

Without the benefit of the *QUEST* workshop, I would probably not have had the incentive to learn about and apply these great web tools to my work."

"We are launching a new blog on our web site and the workshop provided a lot of information and inspiration for us. Craig had a lot of great advice about determining the goals of the blog, and suggestions about the voice of the blog (behind the scenes, voice of authority on a particular topic, breaking news, etc.). It really helped me come up with a framework and strategy for our blog."

"The Google Map workshop was very helpful to put into perspective some things I had already been experimenting with. I had previously tried to create my own Google Map for a field trip we were leading, and had only partial success. The *QUEST* workshop explained several of the tools, and reconfirmed some of the other things I was trying to do. The workshop gave me some confidence that I was on the right track, and that it is a very useful tool that deserved more investigation."

From participants' feedback, it is clear that the media training workshops not only provided partners with new tools to reach their online audiences, but also helped build partners' confidence in implementing these tools and creating strategies for using these tools to best suit their needs.

Challenges

For several partner organizations, finding the time to incorporate these tools into their web presence has been a challenge. For one participant, he is the sole web person supporting several sites at his organization. His time is already committed to managing the web sites and creating "traditional" media content, such as text and photos. He shares:

"In summary, I would have to say my overall impression has been, 'So many wonderful tools, so little time.' But the inspiration from your workshops has encouraged me to make time to at least dip my toes in these waters."

Other participants encountered challenges because of their role within the organization or because of the type of organization they belonged to:

" I have realized that it is very important that someone from our Marketing Department be included in these meetings, as I do not have the authority to post without meetings, buy-in, etc."

"We've been talking and dabbling in social media, but because we are part of the government, we have some specific limitations to our use of those media."

Even with these challenges however, participants still valued the opportunity to learn about emerging technologies and how they may be used within their organizations.

Future Trainings

Many participants expressed a desire for more media training workshops from KQED. Some topics of interest include:

- Video for the web
- Slideshows
- Project management/Collaborations/Workflow
- Best practices
- New media outcomes
- Tracking
- Expanding blogs beyond text
- Packaging content (e.g., improving podcasts)
- Storytelling/media making

From the feedback provided, it is evident that KQED is providing a valuable resource for its partners. As a public media company with extensive experience in educator professional development, KQED is in a position to provide quality training in the application of media tools. Participant responses demonstrate the success of this approach as partners were quite pleased with the workshops and have requested that KQED provide further training in additional topics.