IRIS NSTA Educator Brand Awareness Survey Summary

April 18, 2017

Bradford Davey - Technology for Learning Consortium, Inc.
Michael Hubenthal – IRIS Consortium

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Executive Summary

To establish a baseline of IRIS brand awareness among a national cohort of science teachers, we conducted an evaluation procedure at the 2017 National Science Teachers Association (NSTA) national conference. Working with a sample of 233 conference attendees, we asked a series of questions designed to gain insight into attendees use of resources related to the teaching of earthquakes, seismic waves, Earth's internal structure, and plate tectonics. Only 135 of those interviewed (58%) had taught one of the related topics within the last three years. This group of respondents had an average of 14 years of teaching experience, taught mostly in a middle school (43%) or high school (37%), and primarily taught Earth Science (26%), Integrated Science (13%), and Biology (11%). Most thought of USGS (16%) and NASA (11%), followed by IRIS (6%), the Internet (6%) and NOAA(5%), as places they would go for educational resources and/or data to teach about our core topics. About two thirds of respondents who had taught one of the related topics within the last three years had not heard of IRIS (n=85). Of the remaining third that had heard of IRIS, 29 reported using IRIS resources. For those educators that had used IRIS resources, they had a very favorable impression of them describing them as "very good" (48%) or "good" (17%) and were likely to recommend them to a colleague.

Background

Goal: The purpose of this survey was…

1) To develop a baseline of IRIS brand awareness among science teachers attending the 2017 NSTA Convention
2) To develop a baseline of perceived quality of IRIS products by science teachers attending the 2017 NSTA Convention

Stakeholders: IRIS EPO Staff, IRIS EPO Standing Committee, IRIS EPO BOD

Population: Attendees of the 2017 National Science Teachers Association

Competitors: For the purposes of this study, competitors are defined as other geoscience scientific research organizations focused on earthquakes, plate tectonics, or Earth structure, that produce educational products and programs for teachers. NASA was also included as a benchmark.

Methods

Protocol: Facilitated site intercept survey, using multiple collection locations, and systematic sampling.

Original Protocol:

To recruit participants to the survey, an interviewer will station themselves at key locations at the NSTA convention such as entry points. Once in position, the interviewer will begin to count traffic flow at that site. An estimate of the expected NSTA population was derived from a comparison of the metro population of the host city and the actual conference attendance over the past 4 years (Table 1). Using this approach we find that on average there are .00275 attendees per person living in the host metropolitan area, and predict the 2017 NSTA to be roughly 10,725. Using this population, a sample size of at least 371 people was determined to achieve a confidence level of 95% and 5% margin of error (e.g. https://www.surveymonkey.com/mp/sample-size-calculator/) . To recruit this sample the interviewer will approach every 15th person.

Table 1. Location and attendance of the NSTA National Convention 2013 – 2016 and the projected attendance for the 2017 convention held in Los Angeles.

	2013	**2014**	**2015**	**2016**	**2017 Projection**
Host City	San Antonio	Boston	Chicago	Nashville	Los Angeles
NSTA Attendance	8462	11,500	9,758	7,860	**10,725**
Metro Pop.	2.1 Million	4.7 Million	9.7 Million	1.7 Million	3.9 Million

Revised Protocol:

To accelerate the process and increase our sample size we abandoned systematic sampling. This was needed because we underestimated the amount of staff hours that would be needed to reach our participation goals. Surveyors took an iPad into the conference hall (both the exhibitors floor and outside in the main lobby area of the convention center) and approached participants at random and asked them if they would be willing to take the short survey in exchange for a IRIS slinky as a "thank you" gift. If the participant said they would, they were taken through the survey. Using this revised approach, we were able to interview a total of 233 participants.

After the 2017 conference, NSTA released the attendance numbers. Using this same sample size calculator on the known population of 9,511 (as reported by NSTA), using a 95% confidence level, and a 6.4% margin of error, we calculate a needed sample size of 229.

Results

The first item asked of conference attendees was, "Within the past three years, have you taught about any or all of the following topics: earthquakes, seismic waves, Earth's internal structure, or plate tectonics?" If participants answered "No" they were thanked, given the IRIS Slinkey, and the survey was over. If the participant answered "Yes" they proceeded to the next item. A total of 58% of those asked (N=135) reported that they had taught about at least one of the topics in the past three years. They would get their Slinkey at the end.

Table 2: Within the past three years, have you taught about any or all of the following topics: earthquakes, seismic waves, Earth's internal structure, or plate tectonics?

	N	%
Yes	135	58%
No	98	42%

The remaining educators were next asked what they taught and for how long. Teachers averaged 14 years of teaching with a minimum number of years of one and a maximum of 37. Nearly half of the educators reported teaching middle school (43%), followed by those teaching high school (37%), and those teaching elementary (17%). A small number of educators (2%) reported either teaching at the college level or not teaching but delivering professional development.

Table 3: What level do you teach? Results from the IRIS survey compared to those reported by NSTA in their post-event report.

	NSTA Reported	IRIS Survey Results	
	%	**N**	**%**
Elementary	20%	22	17%
Middle School	33%	57	43%
High School	40%	49	37%
College	8%	2	2%
Do not teach	NA	2	2%

Do not teach described:

- *Teach teachers*
- *Teach PD*

For the educators that reported teaching (N=130) just over a quarter (26%) reported teaching Earth Science followed by teaching Biology (11%), Elementary (9%), Physical Science (7%), Physics (7%), Chemistry (5%), and Environmental Science (4%). Educators also listed some other type of teaching they do including "Integrated" (N=17), All/Everything (N=7), and Science/General Science (4).

Table 4: Which of the following best describes your primary teaching responsibilities? Results include only teachers who had taught earthquakes, seismic waves, Earth's internal structure, or plate tectonics in the past 3 years.

	IRIS Survey Results	
	N	**%**
Biology	15	11%
Chemistry	6	5%
Earth Science	34	26%
Elementary	12	9%
Environmental Science	5	4%
Physical Science	9	7%
Physics	9	7%
Other	42	32%

Other Described

- *Integrated (17)*
- *All/Everything (7)*
- *Science/General Science (4)*
- *Bio, earth science anatomy*
- *Earth, space*
- *Biology, chemistry, earth science*
- *Environmental science, biology*
- *Biology, environmental*
- *ES and geology*
- *Geology*
- *General*
- *Earth and life and physical*
- *Astronomy*
- *Gifted and talented*
- *Special needs*
- *Bio, chemistry, general*
- *PD*

When educators were asked to think about educational resources and/or data that came to mind when they considered teaching about earthquakes, seismic waves, Earth's internal structure, or plate tectonics, there were a number of resources and/or sources of data given with some more common than others. From the development of the word cloud below (Figure 1.1) we can see the places they referred to most often (USGS, NASA, IRIS, NOAA, the Internet and Google, other teachers) and those mentioned less often in smaller print (a complete list of the words/terms given by the educators appears as Appendix A at the end of this report).

	N	%
USGS	46	16%
NASA	33	11%
IRIS	17	6%
Internet	16	6%
NOAA	14	5%
Google	10	3%

Figure 1: Word cloud of sources for educational resources and/or data to teach about earthquakes, seismic waves, Earth's internal structure, or plate tectonics. The word cloud was generated from the following open response item; "When you think of educational resources and/or data to teach about earthquakes, seismic waves, Earth's internal structure, or plate tectonics, what specific sources come to mind?" The six most common words mentioned by educators and their frequencies are shown (N=290).

Educators were next shown two screens with the same organizations on them. On the first screen, they were asked to identify any of the icons that they had heard of seen before. Nearly all of the educators (94%) had heard of or seen the NASA logo before, followed by USGS (89%),

and IRIS (36%). The icons for UNAVCO (5%), SCEC (14%), and Earth Scope (17%) were not as well recognized. Looking at the same icons, educators were asked about educational resources they had used. The results mirrored those about recognition of the name, where the three organizations that were the most recognized, USGS, NASA, and IRIS, were also the most utilized with USGS resources being used by 78% of the educators, NASA by 79%, and IRIS by 20%.

Table 5: Which of the following organizations have you heard of or seen before? (Select all that apply) (N=132) & Thinking of the teaching or data resources you have used, have any of the following organizations provided/developed those? (Select all that apply) (N=132)

	Heard of or seen		Have used	
	N	%	N	%
IRIS Consortium	47	36%	27	20%
National Aeronautics and Space Administration	127	96%	104	79%
UNAVCO	7	5%	4	3%
an NSF+USGS center	19	14%	10	8%
United States Geologic Survey	118	89%	103	78%
EarthScope	22	17%	9	7%
None of these	1	1%	6	5%

The majority of educators reported that they had not heard of IRIS (65%). The remaining 35% had at least heard of IRIS with 8% having used IRIS products at least once and 15% using them regularly (Table 5). Of the much small group (N=47) of educators familiar with IRIS, most had also not heard (46%) or rarely heard (27%) other people talking about IRIS and their educational resources, lessons, and/or products (Table 6). The remaining 41% had occasionally heard (34%) or often heard (7%) others talking. Of the 46 educators who had used IRIS resources, just under half (48%) described the resources they had used as “Very good” with 17% describing them as “good” and the remaining 35% not being sure. Educators that were familiar with IRIS resources

were asked how likely they would be to recommend IRIS to a friend or colleague. Using a scale from 1-10 with 10 being highly likely, educators gave a mean response of 8.0/10 with a range from 3 to 10.

Table 6: How familiar are you with IRIS? (N=131)

	N	%
I've never heard of them	85	65%
I've heard of them but never used their products	17	13%
I've used their products at least once	10	8%
I use their products regularly	19	15%

Table 7: In the last year, how often have you heard other people talking about IRIS and their educational resources, lessons, and/or products? (N=47)

	N	%
Never	19	46%
Rarely	11	27%
Occasionally	14	34%
Often	3	7%

Table 8: Overall, how would you rate the quality of IRIS's educational resources, lessons, and/or products? (N=46)

	N	%
Very Good	22	48%
Good	8	17%
I'm not sure	16	35%

How likely is it that you would recommend IRIS to a friend or colleague? (N=40)
Educators rated their likeliness to recommend IRIS to a friend or colleague at 8.0/10

Conclusions and Recommendations

The purpose of this survey was twofold:

- Develop a baseline of IRIS brand awareness among science teachers attending the 2017 NSTA Convention and
- Develop a baseline of perceived quality of IRIS products by science teachers attending the 2017 NSTA Convention.

To meet our first goal, we collected data from conference participants using a more purposeful method than proposed to ensure as many responses as possible, ultimately recording 233 (71%) of our original goal of 329 responses. Educators were asked questions revealing their awareness of IRIS. Overall, of the educators who taught IRIS related concepts (58%), 36% had heard of or seen IRIS previously with 20% having used a teaching resource developed/provided by IRIS.

To meet our second goal, we asked the 58% of educators who taught IRIS related concepts about their experiences with IRIS resources. Of the 20% of educators who reported using a resourced developed or provided by IRIS, a majority of them (65%) reported the quality of the resource, lesson, and/or product as “good” or “very good” with the remainder indicating they “weren’t sure”.

We have established our baseline. Interviewing a national audience of educators working directly in STEM disciplines, we have learned where most educators get information about earthquakes, plate tectonics, or Earth structure and related concepts – mainly USGS and NASA. We have learned that most educators were not familiar withIRIS. However, we have also learned that those educators who have used IRIS resources find them to be of high quality.

It will be difficult for IRIS, an organization with roughly a $29 million budget in fiscal year 2016, to achieve the brand recognition of an organization like NASA that had a $19.3 billion budget in FY 2016 and is involved in a number of highly publicized activities (ISS, Hubble, rocket launches, moon landings). However, the task now is to develop new strategies to get the word out about IRIS, the educational lessons, products, and resources it offers and the quality they contain, to increase the IRIS brand recognition beyond this baseline.

Appendix A: Survey

This survey will consist of a maximum of 11 questions and will take less than 5 minutes to complete. Responses to this survey will be completely anonymous and the data will only be presented in aggregate.

1. Within the past three years, have you taught about any or all of the following topics: earthquakes, seismic waves, Earth's internal structure, or plate tectonics?
    a. Yes
    b. No *(IF NO, END OF SURVEY)*

2. What level do you teach?
    a. Elementary
    b. Middle School
    c. High School College
    d. Not a teacher (Describe)

3. Which of the following best describes your primary teaching responsibilities?
    a. Biology
    b. Chemistry
    c. Earth Science
    d. Elementary
    e. Environmental Science
    f. Physical Science
    g. Physics
    h. Other (please specify)

4. How many years have you been teaching?

5. When you think of educational resources and/or data to teach about earthquakes, seismic waves, Earth's internal structure, or plate tectonics, what organizations or specific sources come to mind?

(Note the order of images for #6 and #7 were randomly generated for each participant)

6. Which of the following organizations have you heard of or seen before? (Select all that apply)

- [ ] Southern California Earthquake Center
- [ ] United States Geologic Survey
- [ ] IRIS Consortium
- [ ] UNAVCO
- [ ] National Aeronautics and Space Administration
- [ ] EarthScope
- [ ] None of these organizations

7. Thinking of the teaching or data resources you have used, have any of the following organizations provided/developed those? (Select all that apply)

- [ ] Southern California Earthquake Center
- [ ] United States Geologic Survey
- [ ] IRIS Consortium
- [ ] UNAVCO
- [ ] National Aeronautics and Space Administration
- [ ] EarthScope
- [ ] None of these organizations

8. How familiar are you with IRIS?

a. I've never heard of them *(IF CHOICE A, END OF SURVEY)*
b. I've heard of them but never used their products
c. I've used their products at least once
d. I use their products regularly

9. In the last year, how often have you heard other people talking about IRIS and their educational resources, lessons, and/or products?

a. Never
b. Rarely
c. Occasionally
d. Often
e. Extremely often

10. Overall, how would you rate the quality of IRIS's educational resources, lessons, and/or products?

a. Very bad
b. Poor
c. OK
d. Good
e. Very Good
f. I'm not sure

11. How likely is it that you would recommend IRIS to a friend or colleague?

Not at all likely Extremely likely

1 2 3 4 5 6 7 8 9 10

Appendix B: Word list for Word Could (figure 1)

Online	*NOAA*	*PHET*
teacherpayteachers	*NASA*	*Internet*
biology corner	*Carolina biological*	*Textbooks*
junction	*NASA*	*NASA*
Internet	*YouTube*	*JPL*
textbooks	*Stemscopes*	*Internet*
Online	*USGS*	*NASA*
collegeboard	*Colleagues*	*NOAA*
NOAA	*NOAA*	*Teachers pay Teachers*
Monterey bay aquarium	*USGS*	*PHET*
NASA	*NASA*	*Teachers pay Teachers*
USGS	*Shake table groups*	*Foss*
USGS	*USGS*	*NGSS*
Textbook	*NASA*	*Learning center*
Google	*IRIA*	*Teachers pay Teachers*
Foss	*USGS*	*Internet*
Online real time data	*NASA*	*Textbooks*
USGS	*NOAA*	*Textbooks*
HHMI	*USGS*	*Internet*
USGS	*NOAA*	*Google*
Google	*Wikipedia*	*NASA*
Google classroom	*NOAA*	*USGS*
USGS	*Discovery Science*	*National Geographic*
IGS	*USGS*	*District material*
USGS	*NASA*	*USGS*
IGS	*Finn*	*NSTA*
USGS	*NASCO*	*USGS*
IGS	*Carolina biological supply*	*NASA*
USGS	*Internet*	*IRIS*
IGS	*Lawrence hall*	*IRIS*
Flinn	*Teach engineering*	*USGS*
HHMI	*Google*	*NASA*
Flinn	*Google*	*USGS*
IB	*USGS*	*PHET*
Internet	*Carolina*	*USGS*
NSTA	*Education innovations*	*IRIS*
National Geographic	*Delta*	*USGS*
Fischer	*NGSS*	*NOAA*
NASA	*NSTA*	*USGS*
Internet	*Soil science*	*NASA*
National Geographic	*Ago*	*NOAA*

USGS	*BMG*	*Paso*
USGS	*Foss*	*Flynn*
USGS	*Educational innovations*	*USGS*
NASA	*Foss*	*NGSS*
Google	*NASA*	*YouTube*
All over	*National Parks*	*PBS*
National Geographic	*Library of congress*	*Free resources*
USGS	*NOAA*	*NSTA*
NASA	*State department*	*Textbooks*
Pitsco	*Forestry*	*Catalogs*
NASA	*Print*	*IRIS*
USGS	*Harcourt*	*Google*
NOAA	*NASA*	*USGS*
Windows to the universe	*Teachers pay Teachers*	*Flynn*
Wisconsin mineralogy	*Stem scopes*	*Pasco*
National Geographic	*Harcourt*	*Ed innovation*
NSTA	*IRIS*	*Classes*
NASA	*USGS*	*Workshops*
USGS	*NASA*	*Curriculum engine*
USGS	*IRIS*	*NGSS*
IRIS	*NASA*	*NASA*
NOAA	*USGS*	*NGSS*
NASA	*NASA*	*Georgia performance center*
Google	*NASA*	*Short videos*
HHMI	*NOAA*	*PBS*
NOAA	*Internet*	*NOVA*
NASA	*TCI*	*IRIS*
USGS	*Pearson*	*Alaska earthquake*
IRIS	*NASA*	*Google*
National weather	*IRIS*	*Google*
Skeptical science	*National Geographic*	*PHET*
National Geographic	*Internet*	*Catalogs*
Teachers	*NSTA*	*USGS*
Workshop	*Internet*	*Google earth*
Videos	*Internet*	*SCQC*
PBS	*USGS*	*SCQC*
Data stream	*NASA*	*NASA*
USGS	*Internet*	*IRIS*
NOVA	*Internet*	*USGS*
NGSS	*NASA*	*IRIS*
USGS	*ck12*	*NASA*
IRIS	*Internet*	*USGS*
NASA	*NASA*	*IRIS*
USGS	*National Geographic*	*Earth watch*

Google *Textbooks* *Internet* *USGS* *NOAA* *NSTA* *Colleagues* *McGraw Hill* *Flinn* *Internet* *Agintheclassroom,* *USGS*	*Flinn* *Pasco* *Nasco* *Internet* *NSTA* *NASA* *genetics.utah* *Open source* *Google classroom* *USGS* *IRIS* *PHET*	*NASA* *USGS* *IRIS* *IRIS* *USGS* *Textbooks* *Delta science* *Project wet* *USGS* *In class labs* *USGS*