

Polarized Radio Waves

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THIS IS NOT A DEFINITIVE FINAL REPORT

FORMATIVE evaluation studies like this one often:

- **are conducted quickly**, which may mean
 - small sample sizes
 - expedited analyses
 - brief reports
- **look at an earlier version** of the exhibit/program, which may mean
 - a focus on problems and solutions, rather than successes
 - a change in form or title of the final exhibit/program

Polarized Radio Waves Exhibit Remedial Evaluation Report Joshua Gutwill October 27, 1998

1. Exhibit under evaluation: Polarized Radio Waves

This exhibit has been on the floor for some time. We are conducting a remedial evaluation of it as part of the Matter/World revamping project.

2. Goals of the Evaluation

We are trying to determine whether visitors understand the exhibit and are attracted to the exhibit. In particular, we want to investigate whether visitors are confused by an analogy made in the label that likens the exhibit to a TV or radio. The potential confusion lies in the fact that the TV antenna must be oriented horizontally so that it can receive polarized EM waves, while the exhibit's grating must be oriented so that it can block EM waves. Does the receive vs. block distinction confuse visitors?

3. Methods for evaluation

Interview

We employed a cued interview technique with 10 visitors. The interview lasted approximately 10-15 minutes.

Visitor selection

The visitors were chosen at random as they entered the electricity section. Methods for choosing visitors were:

- Choose the first person who crosses the bridge. If in a group, choose visitor nearest the interviewer.
- Let visitors refer back to the label during the interview
- Stand 5 feet from exhibit during first 2 questions
- Age \geq 13 years

4. Findings

Synopsis of Results:

- Nearly all visitors understood the main point of the exhibit – namely, that the grating blocks waves when it is oriented in one direction, but not when it is oriented in the other direction.
- The exhibit is not very attractive to visitors. They cannot easily see what it does, and there is nothing to really draw them to it. Many believe it is hard to know that the two boxes comprise one exhibit.

Questions & Results:

1. It's this exhibit over here. Before you look at it closely, could you tell me just at first glance, how interesting does the exhibit seem to you?

Uninteresting	Somewhat uninteresting	Neutral	Somewhat interesting	Interesting
3	0	6	1	0

Average = 2.5 (Motor Effect's mean was 3.4)

2. Can you say what it is about this exhibit that makes it (un)interesting?

*Neutral to Uninteresting responses*Don't know what it does (80%)

Doesn't look like 1 exh; can't tell what it does

Just 2 boxes; don't know what it does

Just 2 boxes; no buttons to push

Don't see anything happening

Doesn't appear to do anything

Not clear; Too static.

By looking, don't know what it is; no big attraction

Looks old; spread too far apart; hard to make it do anything

Looks highly technical

Somewhat interesting responses

The electronics [are interesting] & it's big

Now, if I could ask you to spend a few minutes playing with the exhibit, reading about it, whatever, so that you get a bit familiar with it. Then when you're ready, I'd like to talk with you about it. [leave them alone with the exhibit] To start, I'd like to ask you about the different parts of the exhibit, so we can find out if it's clear what each part does.

3. [Point to yellow box on right] What do you think this thing is?

90% say it's a transmitter and realize that it sends waves. Of them, 2 visitors think that the waves are sound waves.

10% say it is some sort of satellite.

4. [Point to yellow box on left] What do you think this thing is?

90% say it's a receiver and understand that it receives the waves.

10% say it's a receiver that sends the waves.

5. [Point to metal grating] What do you think this thing does?

100% say that it blocks the waves.

OK, now I'd like to ask you about the exhibit as a whole. Go ahead and hold the metal grating in front of the yellow box, and rotate it slowly.

6. Why is there no sound when the grating is oriented one way but not the other?

80% say that it blocks the waves when it is oriented one way and doesn't block them when it is oriented another way.

We're trying to decide whether we should include this part about the radio or not.

7. Do you think that part is going to help visitors or make things more confusing?

100% say that they think it would help visitors. Many expressed that they liked the real world application.

8. How do you think this exhibit is similar to a TV or a radio?

70% are able to make a mapping to a TV or radio, such as stating that the receiver is like a TV or radio in that it receives waves.

One visitor, who understood the exhibit quite well, was confused by the analogy to TVs:
It didn't make [a lot of sense]. There isn't a good connection [between the TV/radio and the exhibit]. I thought this [grating] is for blocking and this [label text] is about receiving. This is a pretty complicated exhibit actually.

9. Do you have any special interest, knowledge or training in the areas of electricity and magnetism?

60% had some sort of training (mostly high school or college courses)

10. Is this your first visit to the Exploratorium? Y N

70% were first-time visitors

5. Recommendations

Increase Understandability

- Retain analogy to TV and radio.
- Remove or cover radio embedded in Transmitter box.

Increase Attractive Power

- Make the connection between the boxes clearer. Perhaps add a cardboard backing that connects them and displays a diagram of the wave motion?
- Move the receiver out of the corner. It is difficult to read the label where it is. Perhaps switch the boxes? Many visitors seemed to notice the Transmitter first, but then are lost what to do with it.
- Make it more obvious what to do with the exhibit from afar. Perhaps a large sign on the Receiver, below the grating, that beckons the visitor to turn the grating? Perhaps something inviting on the cardboard backing suggested above?