

Do visitors find Exploratorium exhibits difficult to use?

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Do visitors find Exploratorium exhibits difficult to use? “Challenging” Exhibits Sign Study

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Goal

To determine (a) how frequently visitors experience Exploratorium exhibits as challenging (difficult to use), (b) whether a special sign placed on challenging exhibits would be helpful to visitors, and (c) which sign text is most popular with visitors.

Methods

- 120 visitors participated in a cued interview — individuals only.
- Age \geq 8 years old.
- There were two parts to the interview: Part 1 asked visitors about their experience with “Challenging” exhibits (exhibits that they tried to get to work, but could not). Part 2 asked visitors about the possible remedy of a sign posted on challenging exhibits.
- The versions of the signs were:
 - (1) Why Can't I Make This Work? Some exhibits are easier to do when you've got an extra hand. Find an Explainer in an orange vest if you'd like some extra help.
 - (2) Why Can't I Make This Work? Some people find this an especially challenging exhibit. Find an Explainer in an orange vest if you'd like some extra help.
 - (3) Need Help? Some exhibits are easier to do when you've got an extra hand. Find an Explainer in an orange vest if you'd like some extra help.
 - (4) Need Help? Some people find this an especially challenging exhibit. Find an Explainer in an orange vest if you'd like some extra help.
- The interviews were conducted at the exit, as visitors left the museum.
- The ordering of the signs was randomized for each visitor.

Summary of results

Part I: Visitors' experience with "challenging exhibits"

- Nearly half (47%) of the visitors interviewed had encountered a "challenging exhibit" (defined as an exhibit where the visitor tried to get the exhibit to work, but could not do it).
- Of those 56 visitors who had encountered a challenging exhibit, only 21 (38%) found the experience negative in some way. When asked to choose from among three descriptions of their experience (essentially positive, neutral and negative), this number dropped to 8 (14%).
- The majority of those visitors who encountered a challenging exhibit reported that they came across 1 or 2 such exhibits. A smaller number of visitors encountered 5-10 challenging exhibits during their visit.

Part II: Visitors' opinions about the text of the sign

- Visitors had no statistically significant preference for one sign over the others. There was a non-significant preference for "Need Help?" over "Why Can't I Make This Work?" The main reasons given for this preference were that "Need Help?" is easier to understand and seems more positive than the other text.
- 93 Visitors (85%) felt that such a sign would help them.¹ Mainly, they felt the sign would help them realize that they could ask for help. However, several visitors stated that they had not seen many Explainers around, and that only by having Explainers available would the signs be effective.

Detailed Results

Table 1 shows the demographics of the visitors interviewed.

Table 1. Demographics of visitors interviewed.

Type of visitor	Number of visitors
Males	63
Females	54
Adults	86
Children (8-17 years old)	29
Total	120

Note: Age and gender data are missing from some interviews.

¹ We note that several interviewers felt that visitors often said "yes" to this question because we asked it at the end of the interview and the visitor was simply trying to please us. The technical term for this problem is "pleasing bias," and it must be considered when drawing conclusions from this result.

1. We're interested in hearing about visitors' experience with challenging exhibits that they try to get to work, but can't. Were there any that were like that for you today? Y / N

Table 2. Visitors encountering a “challenging” exhibit.

Response	Visitors	Percent
Yes	56	47%
No	64	53%

2. Do you remember which ones were like that?

In response to this question, some visitors mentioned specific exhibits, while others made vague references to entire sections of the museum (e.g., “all the ones toward the back”). In all, visitors described 38 identifiable exhibits. One difficulty with this type of data was that we did not know whether the exhibits were actually challenging or were simply broken. To determine whether the exhibits were broken, we checked the maintenance computer logs, one week before and one week after the date of the interview. The table below shows the number of exhibits that were found to be broken and those that were not listed on the maintenance computer.

Table 3. Were the “challenging” exhibits actually broken?

Status of exhibit	Number of exhibits	Percent of exhibits
Problem reported in database	11	29%
No problem reported in database	20	53%
Exhibit was working on day of interview*	7	18%

* One of our interviewers (Anna Strauss) checked the exhibits after her interviews.

Table 3 shows that 27 (71%) of the identifiable exhibits reported as “challenging” did not appear to be broken at the time of the interview. This suggests that visitors do, in fact, find some of our working exhibits challenging.

However, as shown in Table 4, some of the exhibits that were reported as challenging do not require intricate physical manipulations. For example, Shadow Box was mentioned by four separate groups as challenging (the highest frequency for any exhibit), yet visitors must simply stand inside of and wait for a flash. Perhaps this exhibit, as well as others mentioned in Table 4, simply need clearer instructions.

Table 4. Visitors spontaneously mentioning exhibits as challenging

Challenging exhibits mentioned by visitors	Number of Visitors
Shadow box	4
Liquid Mirror	2
Professor Pulfrich's universe	2
Tornado	2
Visible Effects of the Invisible	2
4 Track Recorder	1
Air Reed	1
Albert	1
Bike Cycle	1
Black sand ("needed more sand")	1
Circuit Workbench	1
Clapping tree	1
Energy vs. power	1
Focused Conversation	1
Hearing Range	1
Hole Saw Rhythms	1
Nerve Impulse: Threshold and Velocity	1
Pin Hole Door ("perhaps because it wasn't sunny enough")	1
Recollections	1
Reflections	1
Resonator	1
Rhythm Rounds-2 feet beat	1
Seeing Time	1
Vibrating pinscreen	1
Water Standing on Air	1

3. What was that experience like for you [of trying to get an exhibit to work but not being able to do it]?

Table 5. Visitors' experiences with challenging exhibits.

Response	Response Type	Visitors who encountered	Percent of Vs who encountered
Most are easy	Positive	2	3%
Other Positive	Positive	1	2%
TOTAL POSITIVE		3	5%
Just moved on	Neutral	13	22%
Thought exhibit was broken	Neutral	6	10%
Didn't spend the effort	Neutral	5	9%
Didn't matter	Neutral	3	5%
Challenging	Neutral	3	5%
Other Neutral	Neutral	1	2%
TOTAL NEUTRAL		31	53%
Over my head	Negative	4	7%
Frustrated	Negative	10	17%
Disappointed	Negative	3	5%
Other Negative	Negative	4	7%
TOTAL NEGATIVE		21	36%
Don't know	N/A	3	5%

4. So which, if any, of these statements best sums up your experience?

- It was fun to try to get it to work.
 I felt frustrated.
 I didn't care. I just moved on.

Table 6. Visitors' forced-choice experiences with challenging exhibits.

Response	Response Type	Visitors who encountered	Percent of Vs who encountered
It was fun to try to get it to work.	Positive	16	30%
I didn't care. I just moved on.	Neutral	29	55%
I felt frustrated.	Negative	8	15%

Comparing responses to Question 3 (which was an open-ended question) to Question 4 (which was a multiple choice question), we found that many visitors changed their answer:

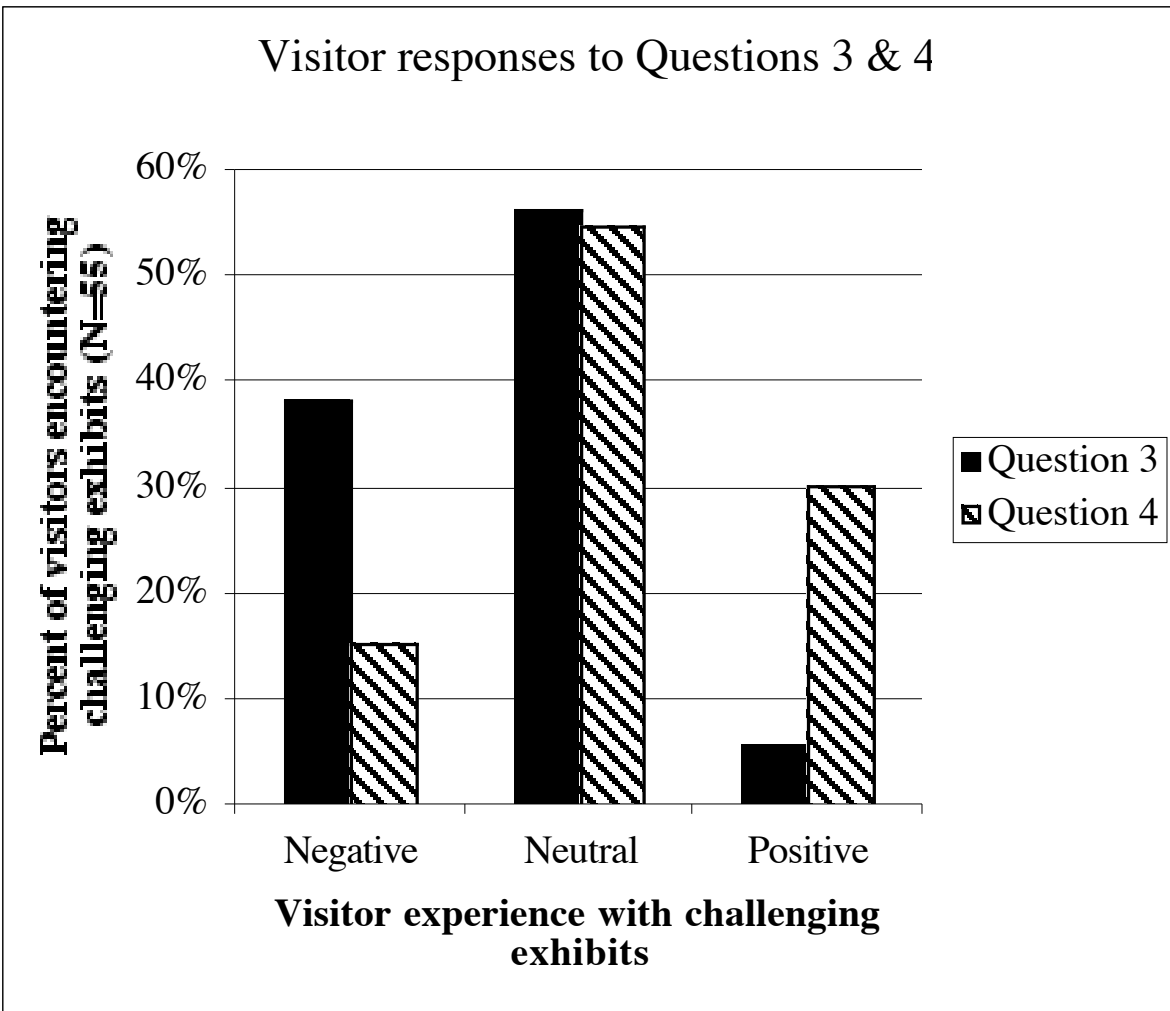


Table 7 below shows the breakdown of visitors who gave positive, neutral or negative responses in questions 3 and 4.

Table 7. Number of visitors responding to open-ended and forced-choice formats in Qs 3 & 4.

Visitor response		Final Multiple Choice Answer (Question 4)			
		Positive	Neutral	Negative	Total
Initial	Positive	3	0	0	3
Open-ended	Neutral	8	18	4	30
Answer	Negative	4	11	4	19
(Question 3)	Total	15	29	8	52

This is a puzzling result. It would seem that visitors felt much more positive about their experience with challenging exhibits when they were asked to choose from a set of three alternatives, as in Question 4. It may be that some visitors did not realize that the experience could be a positive one until they saw that choice. However, as shown in Table 7, eleven visitors went from negative to neutral. Perhaps the wording of Question 4 was problematic; in hindsight, it would have been more systematic to use first-person statements throughout, rather than just on the second and third entries.

5. How many exhibits were like this for you today? (circle one)

0 1 2 3 4 5-10 10-20 Over 20

Table 8. Number of challenging exhibits encountered

Number of exhibits found “challenging”	Visitors	Percent
0	57	51%
1	17	15%
2	18	16%
3	6	5%
4	8	7%
5-10	5	5%
10-20	0	0%
Over 20	0	0%

6. We're thinking about putting a sign on our exhibits to address this issue. Which of these versions of the sign do you like the best? Why?

Table 9. Number of visitors choosing each sign text.

Favorite sign	Visitors	Percent
Why Can't I Make This Work? Some exhibits are easier to do when you've got an extra hand. Find an Explainer in an orange vest if you'd like some extra help.	23	21%
Why Can't I Make This Work? Some people find this an especially challenging exhibit. Find an Explainer in an orange vest if you'd like some extra help.	24	22%
Need Help? Some exhibits are easier to do when you've got an extra hand. Find an Explainer in an orange vest if you'd like some extra help.	25	23%
Need Help? Some people find this an especially challenging exhibit. Find an Explainer in an orange vest if you'd like some extra help.	36	33%

A Chi-square test finds no statistically significant difference between this observed result and a result based on random chance ($\chi^2 = 0.25$, $p = .97$).

Table 10. Number of visitors giving reasons for choosing a favorite sign.

Visitor reasons for why sign is favorite	Why Can't... Extra Hand	Why Can't... People Find Challenging	Need Help... Extra Hand	Need Help... People Find Challenging	Total
Feels less insulting/condescending	9	6	8	9	32
Easy to understand	0	5	6	11	22
Don't know why	2	1	5	3	11
Tells what to do	0	2	4	3	9
Has a better tone	7	1	0	0	8
Seems more positive	0	0	4	4	8
Question is what I ask myself	1	4	0	0	5
(Visitor restates wording of sign)	1	0	1	2	5
Doesn't try to get inside my head	0	0	1	1	2
Don't like any of these	0	0	0	0	2
Like the "extra hand"	2	0	0	0	2
Seems more specific	1	1	0	0	2
Signs are needed	0	1	0	2	3
Signs won't work	0	0	0	0	2
Exhibits are just broken	0	0	1	0	1
Sometimes there are no Explainers	0	0	0	1	1
Other	0	0	0	1	1

Note: Some visitors gave more than one reason for liking a particular sign.

**7. Do you think that having this sign on the challenging exhibit(s) would have helped you?
Y / N Why? In what way?**

Table 11. Would a sign help?

Response	Visitors	Percent
Yes	93	85%
No	17	15%

Table 12. Number of visitors giving reasons why a sign would or would not help.

Reasons why sign would/would not help	Visitor response about sign		Total
	Would help	Would not help	
I would/could get help	41	0	41
Tells me I'm not dumb/keep trying	15	0	15
I would just move on anyway	6	7	13
(No reason given)	9	0	9
I thought the exhibit was broken	6	2	8
I saw no Explainers around	6	2	8
I wouldn't look for Explainer	3	4	7
Good only if there are Explainers	7	0	7
I didn't know about Explainers	6	0	6
Sign should explain exhibit	6	0	6
Other	5	0	5
I don't need a sign	0	4	4
Sign should say where Explainers are	1	0	1

Note: Some visitors gave more than one reason.

Conclusions

- Almost half of the Exploratorium’s visitors do have difficulty using some exhibits, even ones that are working.
- Most visitors who encounter difficult-to-use exhibits simply move on to the next exhibit. A minority feel frustrated.
- Visitors seem to believe that a sign would help them, particularly because it would inform them about the role of Explainers. Many visitors stated that they did not know that anyone was available to help them with the exhibits.
- Visitors had no significant preference for the one sign over another, though slightly more visitors preferred the “Need Help?” sign over the “Why Can’t I Make This Work?” sign.

Recommendations

It is still not clear to me whether we should place “Need Help?” signs on exhibits.

First, the data from question 2 (“which exhibits were challenging for you?”) suggest that contemplative exhibits may be the challenging ones for visitors because they don’t know what to do at those exhibits. A “Need Help?” sign would not improve this situation, but a new exhibit label that explicitly tells visitors to watch and contemplate may help.

Second, I am concerned about our method for choosing exhibits that would get such a sign. So far, I do not believe that any of the candidates proposed by the Morning Explainer staff were mentioned by visitors in this study.

Third, the main reason visitors felt that a sign would help was that it would tell them they could get help, particularly from Explainers. It seems to me that we should institute a more global communication method to tell visitors about Explainers, rather than just mention it at a few exhibits. Perhaps visitors could be told at Admissions about Explainers, or signs could be posted throughout the museum with photos of Explainers in orange vests.

Specific recommendations:

- Revisit and revise the “Try This” labels at the exhibits listed in Table 4.
- Provide information about the existence of Explainers throughout the museum.
- Consider placing “Need Help?” signs on certain exhibits as a last resort, only after previous recommendations have been implemented and found inadequate.

Acknowledgments

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The signs shown to visitors

Why Can't I Make This Work?

Some exhibits are easier to do when you've got an extra hand.

Find an Explainer in an orange vest if you'd like some extra help.

Why Can't I Make This Work?

Some people find this an especially challenging exhibit.

Find an Explainer in an orange vest if you'd like some extra help.

Need Help?

Some exhibits are easier to do when you've got an extra hand.

Find an Explainer in an orange vest if you'd like some extra help.

Need Help?

Some people find this an especially challenging exhibit.

Find an Explainer in an orange vest if you'd like some extra help.