

Team-Based Inquiry

Investigate: Part 1



www.nisenet.org

This presentation covers the first half of the Investigate Phase of the TBI cycle: identifying the appropriate methods and developing the instruments necessary to collect the data needed to answer your TBI questions.

Question Phase Review

Question Worksheet



Project Title: _____

Educational Goal(s)
List the goals of your educational experience.

Prioritizing Inquiry Questions
Fill in the table below for each of the broad inquiry questions that you and your team have brainstormed. Based on how useful, actionable, and feasible each question is, determine whether it is a high, medium, or low priority for your team-based inquiry study.

Inquiry question	Why is this question important to your team?	What types of information would you need to answer this question (e.g., visitor comments, program observations)?	What resources would you need to answer this question (e.g., staff, time, expertise, data collection forms)?	What changes might you be able to make if you answered this question?	Based on all of this, how high of a priority is this question? H=High, M=Medium, L=Low
					H M L
					H M L
					H M L
					H M L

Adapted from: [Cascione, J., & Sharp, L. \(Eds.\). \(2007\). User-friendly handbook for mixed method evaluations. Retrieved from http://www.nise.org/publications/2007/07/23/072307start.htm](http://www.nise.org/publications/2007/07/23/072307start.htm)

NISE Network TBI Guide Question worksheet

From the Question worksheet, you have identified what resources will be required and what information you need to gather to answer each TBI question. All of this information is necessary for identifying the most effective data collection methods.

Investigate Phase



But, turning the Questions worksheet into data collection tools is not as simple as it might seem; there are so many different ways you could go about trying to answer your TBI questions, how do you choose?! Each method has inherent strengths and weaknesses. This presentation will cover the three most common types of data collection in museums, which are surveys or questionnaires, interviews, and observations.

Investigate Phase

Strengths



**Surveys or
questionnaires**

Interviews

Observations

Weaknesses



Each method has inherent strengths and weaknesses. This presentation will cover the three most common types of data collection in museums, which are surveys or questionnaires, interviews, and observations.

Alternative Data Collection Methods



There are many ways to go about collecting data to help you answer your questions, so do not limit yourself to the basic methods – consider all types of activities, games, and discussions as potential ways to collect the data you need.

Surveys



Surveys are best when you want people to be honest and feel free to share anything they want to have about your project. Surveys are often anonymous because we don't need to collect identifying information for most studies, so respondents can write more freely about what they think. It is often easier to share negative responses on paper than saying it to someone's face.

Surveys also allow you to collect information from multiple people at once. One person can hand out four surveys in the same amount of time as collecting one data point using other methods, such as interviews and observations.

Surveys

For All Respondents...

5. How enjoyable were the various elements of Science Fusion?

	Not at all enjoyable	Somewhat enjoyable	Enjoyable	Very enjoyable
Exhibits on display for Science Fusion (at tables throughout the museum)		✓		
Doing hands-on activities			✓	
Hearing about current science research			✓	
The variety of presenters			✓	

6. Please share the names of any presenters, organizations, or activities that you really enjoyed or found interesting.

I found the kitchen to be very exciting

7. Please share any suggestions you may have for how we could improve Fusion events.

Next time I would food

8. How would you rate your interest in science on a scale of 0 to 10?

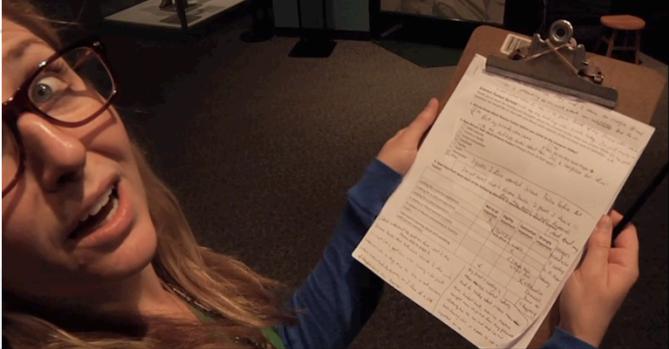
No interest 0 1 2 3 4 5 6 7 8

9. Who did you come to the museum with today?

Adults only

Adults and children

Alone



However, while surveys may allow people to speak more freely, they don't allow you to always dig as deeply with your questioning. That is, of course, unless someone really has something they want to say and they choose to spend the time writing out their thoughts. (It happens.. Just not a lot.)

Interviews



Just like surveys, interviews provide a forum for people to express their thoughts and opinions about whatever you are asking. The great thing about interviews: Since you've engaged the visitor or staff person in conversation, you can ask more probing questions and follow up with specific questions.

For example, you could ask, "What did you think about the graphic panel describing the water cycle?" in both a survey and an interview. People responding to a survey will most likely write, good, ok, boring, or some other brief, cursory response.

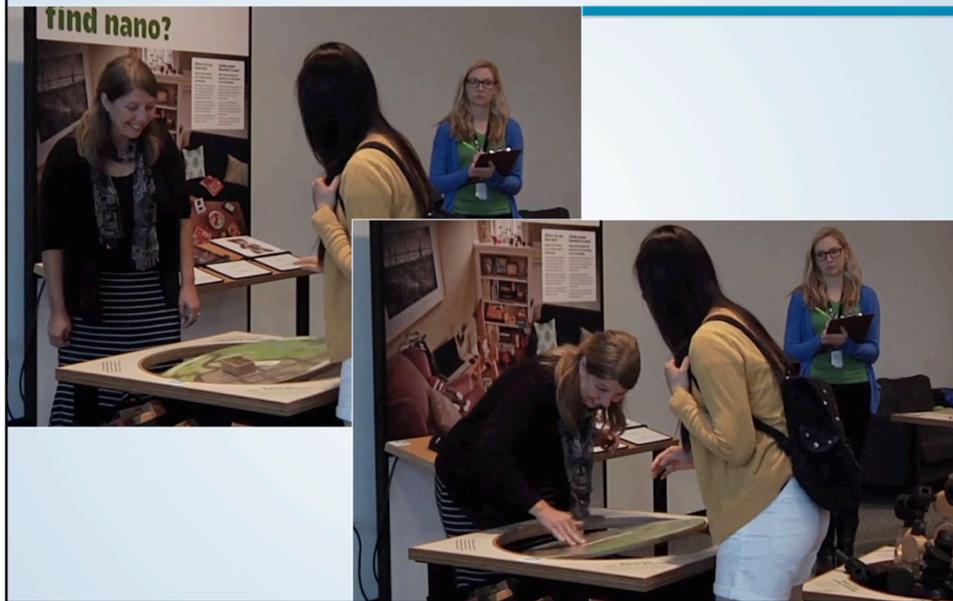
Interview respondents may provide the same answer, but you have the ability to ask them follow up questions, "What made it good? What graphic panels are better than it? What made it boring?" In this way, interviews provide the best opportunity to get at the level of reflection and response that you are looking for in each question.

Interviews



Interviews are also great if you only need feedback from a small sample of people but the information you are looking for is highly specific and in depth. If you need open ended, qualitative information—for instance why some portions of a demonstration are more engaging than others—feedback from a small group would be much more helpful in understanding the intricacies of what audiences may be thinking rather than a paper survey.

Observations



Observations are important if you need to actually see what people are doing or hear what they are saying. When we are unobtrusively observing people, they tend to act normally and authentically engage in their experience.

Observations



Sometimes asking people about what they did during an interview is helpful, but if you want to know just how many people are trying to answer a question as a group versus flipping the panel and reading the answer before discussing, observations might be better than interviews. Trust recorded observations over mental recall when specific behaviors or actions are in question.

Observations are the most in depth data collection method among these three data collection strategies.

Survey issues...

- Legibility
- Language
- Clarity of questions
- Not getting responses from your target person



Legibility, language, and respondents' understanding your questions are all potential barriers to getting helpful data from surveys. Additionally, you may not always be able to control who is answering each question. Sometimes, we hand over a survey to an adult, and the adult starts gathering answers from the other people in their group instead of answering independently!

Interview issues...

- Legibility
- Language
- Clarity of questions
- Not getting responses from your target person
- Environmental issues (noise, chaos, energy)
- Data collector training

Many of these same issues are also problematic for interviews, both in visitors' understanding your questions and in your handwriting. For audio recorded interviews, environmental noise, chaos, and everyone's energy level are possible barriers for conducting effective interviews. Not only should you make sure your method matches your TBI question, you should pay attention to the data collection parameters, too! Will an interview work in your space?

Another consideration for interviews: Data collectors need to be more thoroughly trained before they begin, to ensure they are asking the same questions. Asking even slightly different questions will give you sketchy data.

Observation issues...

- Highly contextual – only for what you are observing
- Environmental issues (noise, chaos, energy)
- Subjective
- Time consuming

Observations are highly contextual, and the information you gather through observations will be very specific to the exhibit or program you are trying to improve. Therefore, you have to be really intentional in what you are trying to observe. Before you hit the floor, create a form that will help you guide your observation.

The amount of activity going on around the observation may draw your attention away or cause you to miss something. Make sure to consider the environment before trying to conduct observations.

It is extremely hard to remain objective while conducting observations. We are human, after all—we give meaning to and have opinions about what we see others doing. It's an issue with observations. Beware.

And, of course, observing people and the way they use an exhibit will take takes as long as it takes for the person to use the exhibit. Observations can become very time intensive.

Comparing Methods: Pros

Surveys

- Want perspectives and feedback
- Need feedback from lots of people
- Are ok with anonymous responses

Interviews

- Want perspectives and feedback
- Want in-depth feedback
- Can ask follow-up questions
- Can use feedback from fewer people

Observations

- Want information on what people do and say
- Want to see the experience
- Can capture staff thoughts
- Can cover more elements



Every data collection method has its weaknesses and strengths. Which one is most useful for your question?

Across all of these, you can see the trade-offs between the amount of time you and your teammates will spend on the data collection and analysis process and the depth of information you will be able to collect. Before you choose a method, ask yourself: what are the needs of my TBI question and how can we get the most out of your data collection process, whatever it may be?

Comparing Methods: Cons

Surveys

- Language barriers
- Legibility
- Terse responses
- Respondent mix

Interviews

- Language barriers
- Chaotic surroundings
- Training required
- Time intensive

Observations

- Highly contextual
- Chaotic surroundings
- Subjectivity is easy
- Time intensive

Time investment ← HIGH

Depth of information → LOW

Across all of these, you can see the trade-offs between the amount of time you and your teammates will spend on the data collection and analysis process and the depth of information you will be able to collect. Before you choose a method, ask yourself: what are the needs of my TBI question and how can we get the most out of your data collection process, whatever it may be?

Consider the Methods Worksheet



Methods Worksheet

Project Title: You Decide!

Team-Based Inquiry Question(s)

1. How could this activity be improved to be more engaging for more than one visitor at a time?
2. What strategies best support visitor engagement and learning in this activity?

Selecting Methods

Fill in the table below for each of the common data collection methods that are used to answer TBI questions. Based on how each method can help you collect the most important data to answer your TBI question(s), determine whether it is a high, medium, or low priority for your data collection process.

Method	What important information could you collect with this method?	What important information could you not collect with this method?	What resources would you need to conduct this method to answer your question (e.g., staff, time, materials, data collection forms)?	What other methods could you use to collect some of this information?	How necessary is this method to collect the information you need? (High, Medium, Low)
Questionnaire / Survey					H M L
Interview					H M L
Observation					H M L
Other?					H M L

NISE Network TBI Guide
Method worksheet

To help you answer this question, consider using the Methods Worksheet. Like the Questions Worksheet, this will help you think through how each data collection method we've just covered can and cannot help you in capturing the data you need to answer your TBI questions.

Take some time now to complete the Methods Worksheet with your team before moving on to the Investigate Part 2 presentation. Thanks!



This presentation is based on work supported by the National Science Foundation under Grant No. 0940143. Any opinions, findings, and conclusions or recommendations expressed in this presentation are those of the authors and do not necessarily reflect the views of the Foundation.

