

## CRITICAL APPRAISAL

Critical appraisal conducted by a visitor expert who knows the visitor studies literature is a useful technique for identifying obvious and potential problems before conducting a visitor study. Obvious problems are those that clearly need to be corrected (e.g., excessively long labels, glare that makes it difficult to see, label placement far away from the object being described). Potential problems might include: use of technical vocabulary, placement of exhibit displays

outside of the visitors' usual sight lines, etc. For the sake of cost-effectiveness, the obvious problems can be corrected and the potential problems can be the focus of a visitor study (either remedial or summative). The following example of critical appraisal will hopefully serve to illustrate the procedure. Perhaps the most difficult aspect of a critical appraisal is minimizing personal bias and restricting the appraisal to empirical findings.

### A Critical Appraisal of *The Heart Exhibition* at the Franklin Institute of Science

Stephen Bitgood & Arlene Benefield  
Center for Social Design

#### Introduction

**Rationale.** Since the *Heart Exhibition* was to undergo changes, a critical appraisal was deemed an appropriate way to begin the renovation process for this exhibition. It is understood that the critique below is based on the opinion of visitor experts (rather than on objective data) and that a visitor study should be conducted to validate the potential problems identified in this report.

**Exhibit objectives.** The following teaching points were specified by the Franklin Institute for the *Heart Exhibition*:

1. *The heart is a pump.*
2. *The heart is part of the circulatory system which brings oxygen and nutrients to every part of the body and gets rid of carbon dioxide waste.*
3. *Diet, exercise, heredity, alcohol, drugs, smoking, stress, age and disease affect how well our heart works.*
4. *Heart disease is one of the major health problems in the U. S.*
5. *Many different treatments and technologies are available to treat heart disease.*

It is noted that these teaching points are different than the original objectives and consequently it is not likely that the current exhibits will produce the new expected outcomes.

#### Critique of the Exhibition

**Orientation.** There is no conceptual or physical orien-

tation to this exhibition. Although it is obvious to visitors from simply looking at the heart model that this exhibit deals with the heart, it is not as obvious that the visitor will be circulating through the model heart as blood circulates through an actual heart. It is also not obvious which exhibit displays are part of the heart and which are not.

- **Recommendation:** Provide a brief orientation label as visitors enter the exhibit. The orientation label might explicitly state the exhibition's objectives (e.g., "The heart is a pump.")

**Relation of exhibit displays to teaching points.** Few of the current displays relate to the stated teaching points of the exhibition. New interactive displays may need to be developed to meet the new set of exhibition objectives. There are currently no exhibit displays that address objective #2, #3, and #4.

**Critique of individual displays.** Generally, label placement for exhibits needs to be improved. Labels are placed in positions that make them difficult to see or too far removed from the exhibit devices. Exhibit display titles do not always make it obvious what the exhibit is about (e.g., "The Philadelphia Heart" or "Listen Carefully"). Several of the exhibit displays are confusing because two displays are presented as one (e.g., "The Philadelphia Heart" and the "Human Heart" next to it.) Also of general concern: lighting levels on many of the exhibit displays are inadequate.

- **Recommendation:** Place labels as close as possible to the action expected of visitors. At the present time labels tend to be too far removed from the action.
- **Recommendation:** Separate exhibit displays from each other so the teaching points are clearly separated. When displays are physically confused, they cause confusion in understanding.
- **Recommendation:** Use titles that communicate better what the display is all about or ask provocative questions (Do you know how an artificial heart works?)
- **Recommendation:** Improve lighting where it is needed.
- **Recommendation:** Make the hands-on displays wheelchair accessible.

Comments on the individual exhibit displays is provided below.

1. The walk-through heart model. This exhibit display is reported to be one of the Museum's most popular icons. Visitors circulate through the chambers of the heart and lungs in the same sequence as blood does. Labels along the pathway are designed to inform the visitor of where he/she is and the significance for the circulatory system. This exhibit involves climbing stairs and narrow passages and therefore restricts the use of strollers and may not be advisable for very large individuals or those with ambulatory problems.

The labels and diagrams inside the heart are not read by many visitors at the present time, probably because: they require too much reading, reading requires stopping and blocking traffic flow, and/or they are too small to be noticed. It may not be clear to visitors why the pathway goes outside the heart (into the lungs) and then back into the heart. (Visitors may not realize that they have even left the heart!). Other questions of concern: Why does the heartbeat sound louder in the lungs than in the heart itself? What happened to the blue and red lights that showed the color of blood before and after it enters the lungs?

- **Recommendation:** Provide some better cues to allow visitors to identify specific locations inside the heart. Brief diagrams/labels or audio information might help. Relate this information to blood circulation. Before entering, tell people that they will circulate through the heart in the same way that blood does.

- **Recommendation:** Inform visitors that they will have to climb stairs and that the passageway becomes narrow in places.

- **Recommendation:** Tell visitors that strollers must be left outside. Provide a parking place for strollers.

- **Recommendation:** Place some type of barrier in the area where children run ahead of parents and re-enter heart. This would relieve parents of the discomfort of momentarily losing their children.

2. "The Philadelphia Heart." This is a model of an artificial heart. The lighting is poor on this exhibit display (see recommendation above with respect to lighting). The label placement is poor. Terminology may not be understood (e.g., reference to "ventricle"). A diagram would probably help relate the label information to the artificial heart. The label "Patent Pending" is unnecessary and could potentially divert visitors from reading more important information.

3. The Human Heart (with accompanying diagram). The label is blocked by the object. While this seems to be a popular object, it misses some of its impact because it is too

high, the label is poorly placed, and the label instructions are not clear. There is also too much information on the heart diagram.

- **Recommendation:** Make the "hands-on" object easier to reach for young children.

- **Recommendation:** Make instructions clearer.

- **Recommendation:** Place instructions in front of object rather than behind.

- **Recommendation:** Develop a label title that clearly identifies what it is.

4. "How Hard Does a Heart Work?" This display consists of a pump, a stop watch, and a cardiac display unit. The purpose of the stop watch is unclear. Visitors tend to look for a connection between squeezing the pump and the effect on the cardiac display unit and/or stop watch.

- **Recommendation:** Delete the stop watch since it does not seem to have a function.

- **Recommendation:** Make it clear that visitor action is unrelated to cardiac display unit.

5. "The Spark that Powers the Heart." This display consists of a button that, when pushed, illustrates how the electrical impulse travels through the heart. The electric impulse is so quick that it is difficult to see the sequence of firing.

- **Recommendation:** Place the label in front of the button rather than behind it.

- **Recommendation:** If it is important to see the sequence of electrical activity, provide a slow motion impulse so that it will be easier to follow. (Perhaps this display is not high priority for exhibition objectives and could be eliminated.)

6. "Online to the Heart." This is a label describing the EKG. It seems to be confused with "The Spark that Powers the Heart."

7. "Fist Sized Pump." This display is a zeotrope that, when spun, is supposed to show the flow of blood through the heart chambers. Unfortunately, this display is next to the "Bioscience" exhibition sign and might be easily confused with one of the displays that is part of that exhibition.

8. "Listen Carefully." This is a label that describes how one is able to hear a heart beat from a stethoscope. The major point of this display is that a stethoscope is based on the principle of sound traveling through an air column. Unfortunately, this is the last sentence in the label. Since it is the most important idea, it should be first!

- **Recommendation:** Re-word the label so that the most important idea is first.

- **Recommendation:** Separate this display from the "Listen In" display, since they are two separate (although related) displays.

9. "Listen In." This display allows the visitor to hear the sounds of heart valves closing. It also demonstrates a heart murmur sound. The label information does not match the material in the exhibit (i.e., the stethoscope is not wooden, it is a plastic cone). Otherwise, it seems to work quite well.

- **Recommendation:** Place the label next to the device instead of in back of it.

- **Recommendation:** Make the label consistent with the exhibit materials.

10. "Your Heart Rate." This display consists of a simple device to allow visitors to determine their heart rate. This display appears to be easily understood and most visitors seem to use it correctly. Two problems: visitors grip too hard and they get concerned when their heart rate is higher than normal.

- **Recommendation:** Add information on the range of what is "normal" under the conditions tested.

11. "Heart Bypass." This display consists of a button and a model in which liquids flow through tubes to illustrate blood flow through arteries. There is lack of connection between pressing the buttons and the impact on the flow of liquid. The flow of liquid should be closer to the button and the label should make the connection better.

- **Recommendation:** Make the connection between button-pressing and liquid flow more obvious. In addition to placing the label closer to the button, perhaps a light behind the liquid flow would help.

- **Recommendation:** Make the instructions and explanation clearer.

12. "Balloon Unclogs Pathway." This display consists of a button, a display of balloon devices used to unclog arteries, and a model where liquid is pumped through tubes. This display suffers from the same problem as "Heart Bypass" (see above).

13. "Sound Waves Measure the Speed." This display is very confusing to visitors. There are too many things to do, the wrist sprayer is at an awkward angle, the "probe" is not easily identified, and it is difficult to produce the rushing sound. By pressing a second button (the first button sprayed moisture on the wrist), the recorded sound of rushing blood is played to the visitor. This appears to confuse visitors—they don't seem to be able to distinguish between sounds produced by

their blood circulation and those produced by the recording. Reference to the Doppler Effect is confusing. Do people understand this?

## GENERAL RECOMMENDATIONS

1. Make sure each exhibit display is closely related to teaching points or objectives.

2. Organize the exhibition area so that it is clear how everything fits together.

3. Design the exhibition area to improve visitor traffic flow during heavy visitation.

4. Collect visitor data to ensure that changes in the exhibition will really work.

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