
Handbook **for Formative Evaluation of Interactive Exhibits**

Léonie Rennie and Terry McClafferty
Science and Mathematics Education Centre
Curtin University of Technology

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Léonie Rennie and Terry McClafferty
Science and Mathematics Education Centre
Curtin University of Technology
Perth, Western Australia
Phone: (09) 351-7484
Fax: (09) 351-2503
Email: irenniel@info.curtin.edu.au

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Table of Contents

| | | |
|------------|---|----|
| 1 | Rationale..... | 1 |
| 2 | Overview of Package..... | 2 |
| 3 | Evaluation Procedure..... | 3 |
| 4 | Steps in the Evaluation Procedure..... | 6 |
| 5 | Choosing Visitors for Observation or Interview..... | 9 |
| 6 | Guidelines for Use of the Visitor Behaviour Schedule..... | 10 |
| 7 | Guidelines for Use of the Exhibit Use Schedule..... | 13 |
| 8 | Guidelines for Use of the Post Use Interview..... | 17 |
| 9 | Introduction to Cued Testing..... | 21 |
| Appendices | | |
| I | Glossary of Terms..... | 22 |
| II | Master Copies of Instruments..... | 23 |
| | Visitor Behaviour Schedule..... | 24 |
| | Exhibit Use Schedule..... | 25 |
| | Exhibit Use Schedule – Summary Sheet..... | 26 |
| | Post Use Interview..... | 27 |
| | Post Use Interview – Summary Sheet..... | 28 |
| III | Pilot Evaluation of <i>Gold Hunter</i> | 29 |
| IV | Training Notes..... | 38 |

Rationale

The purpose of this Handbook is to provide a generic package for the formative evaluation of exhibits. The evaluation package has been developed with three concerns paramount.

- Flexibility: the evaluation procedure must be sufficiently flexible to deal with a variety of exhibits.
- Efficiency: the data collection should be implemented easily and provide the maximum amount of information from the data gathered.
- Validity: the data must be able to answer unambiguously a range of questions related to the operation and understanding of exhibits.

The approach taken reflects the consultants' collective experience which indicates that carefully structured data collection targeting small samples of visitors will provide more useful data for formative evaluation than will larger scale surveys. (A full summative evaluation would require randomised, larger samples and more comprehensive data analysis.) The instruments provided are easy to use, so only a brief training period is required. Straight forward methods of analysis are used which can be understood readily, allowing action to be taken quickly from the results.

The proposed method for this formative evaluation is based on two assumptions.

1. The exhibits have been developed to a prototype stage and are placed in an area readily accessible to visitors.
2. Sufficient flexibility remains in the exhibit design to allow a process of adjustment until a more effective format (within reasonable resource limits) is achieved.

In other words, this evaluation package has been prepared on the assumption that the "front-end" evaluation relating to exhibit development has already occurred, and that the "summative" evaluation phase is beyond the scope of the project.

Overview of Package

The evaluation package consists of three instruments (see Table 1) for observation and/or interview of visitors, together with a general introduction to cued testing, if required. A glossary of terms is included in Appendix I, and Appendix IV contains some training notes.

The evaluation procedure is designed to be flexible:

- Instruments are independent. According to the time and resources available, they can be used alone or in combination.
- Relatively small samples of visitors are required. In formative evaluation, finding a pattern of responses is more important than having large, randomly selected samples.
- Data are easy to interpret in a common sense way. No statistical package is required.

Table 1
Overview of Data Collection Methods

| Instrument* | Type | Purpose | Occasion |
|----------------------------|-----------------------------------|--|--|
| Visitor Behaviour Schedule | Observation | <ol style="list-style-type: none"> 1. Familiarise evaluator with visitor use of exhibit 2. Initial assessment of attractiveness and operation | First stage for new or modified exhibit |
| Exhibit Use Schedule | Observation and Interview | <ol style="list-style-type: none"> 1. Assess reasons for attractiveness of exhibit 2. Assess holding power of exhibit 3. Assess ease of operation | Second stage for new or modified exhibit |
| Post Use Interview | Interview | <ol style="list-style-type: none"> 1. Assess visitor understanding of exhibit 2. Assess perceived relevance of exhibit 3. Assess overall reaction to exhibit 4. Assess interest and enjoyment | Exhibit is judged attractive and functional, visitor learning is focus |
| Cued Testing ** | Structured Interaction at Exhibit | <ol style="list-style-type: none"> 1. Identify reasons for unattractiveness, poor function, etc. 2. Assess visitor reaction to specific cues. 3. Determine visitor understanding/ learning from exhibit | Detailed study is required of exhibit flaws or of visitor understanding Helpful when evaluation time is short |

* Instruments are described later in the handbook.

** A procedure where visitors are asked to study the exhibit and then respond to questions.

Evaluation Procedure

The evaluation procedure is generic and based on five focus questions. Table 2 shows how the focus questions are related to a series of more specific questions, and which instruments are designed to provide answers to these questions.

Stage One answers the question: Do visitors attend to the exhibit and attempt to interact with it? Data will be collected using the Visitor Behaviour Schedule. If the exhibit is successful, the evaluator moves to Stage Two. If not, a cycle of cued testing of visitors, adjustment of exhibit and further observation will occur. Once the exhibit is effective at attracting visitor interaction, Stage Two begins.

Stage Two is aimed at ensuring that the exhibit is functioning as desired. Four focus questions ask (i) How do visitors interact with the exhibit? (ii) How effective are the exhibit cues (eg. text, illustrations)? (iii) How well do visitors understand the exhibit message? and (iv) How do visitors interpret the relevance of the exhibit to their own experiences? Data will be collected using the Exhibit Use Schedule and the Post Use Interview. These instruments have a small number of general questions. This keeps the interview short, but allows visitors to give their opinions on a range of issues, with the interviewer able to probe for more direct responses if required. Cued testing of visitors can also be used to focus specifically on whether visitors understand how to interact with the exhibit, the effectiveness of exhibit cues, such as text and illustrations, the relevance of the exhibit message, and the stated objectives of the exhibit.

The evaluation procedure requires a preparation stage when the evaluator becomes familiar with the exhibit, followed by Stage One and Stage Two. Guidelines for the use of the instruments are in the following sections. A flow chart of the full evaluation procedure is shown in Figure 1.

It is anticipated that not all stages or instruments will be required for all exhibits. When time and resources are limited, an abbreviated procedure will still provide useful information. Some other alternatives are

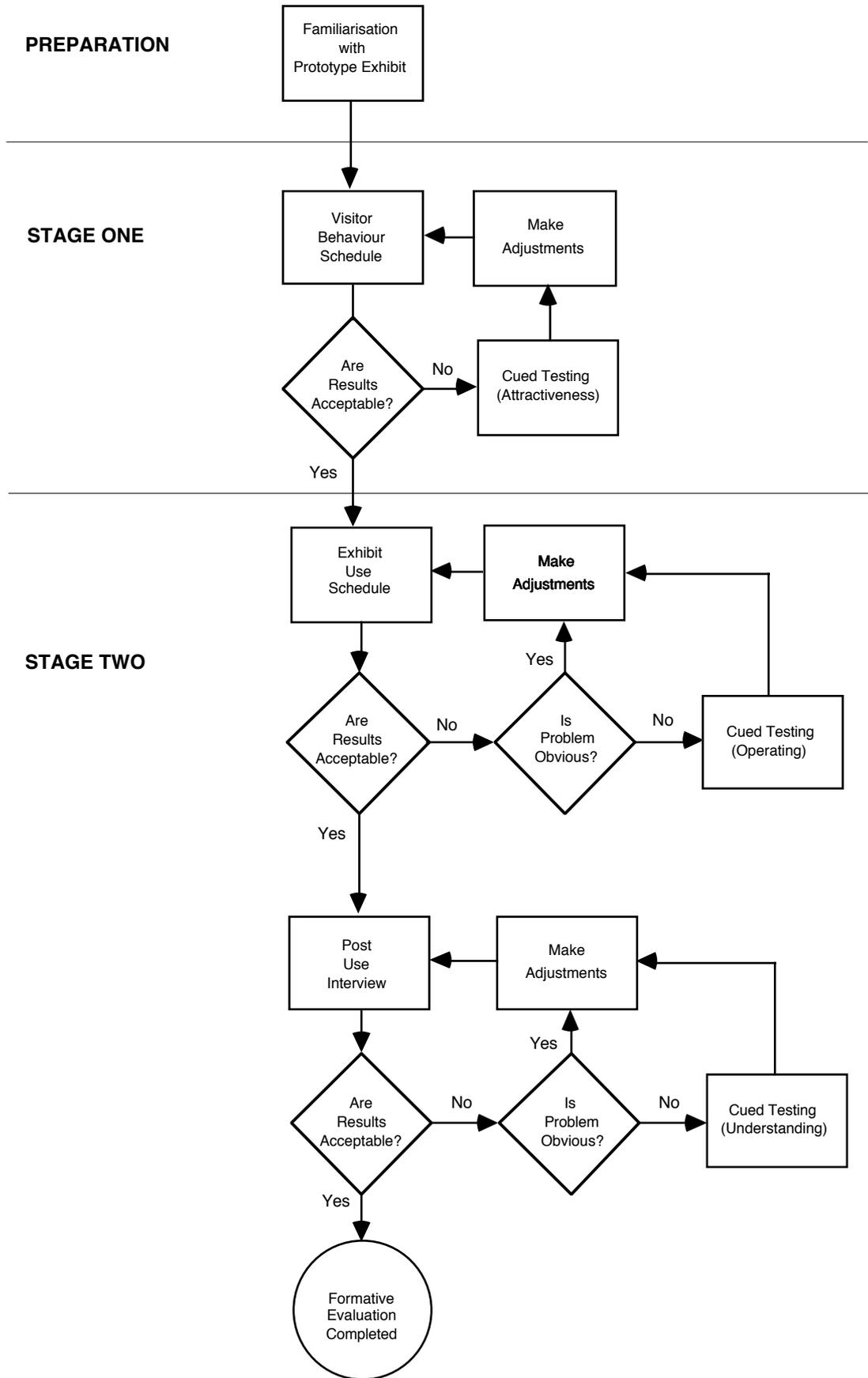
- Preparation → Stage One only
- Preparation → Stage One → Stage Two with either Exhibit Use Schedule
or Post Use Interview
- Preparation → Stage One → cued testing for Stage Two questions
- Preparation → Stage Two → cued testing for specific issues, eg. graphics

Table 2

Relationship between Research Questions and Instruments

| Focus Questions | Types of Questions Addressed | Visitor Behaviour Schedule | Exhibit Usage Schedule | Post Use Interview |
|--|--|-----------------------------------|-------------------------------|---------------------------|
| <i>Do visitors attend to and interact with the exhibit?</i> | 1. What attracts the visitor to the exhibit? | √ | Q 1, 3 | |
| | 2. Can the exhibit be used equally easily by sole visitors and by small groups working together? | √ | √ (Comment) | |
| | 3. Is the intended mode of interaction with the exhibit clear to the visitor? | √ | Q 5 | Q 5 |
| | 4. How easy is the exhibit to operate? | √ | Q 5 | Q 4 |
| <i>Do visitors interact with the exhibit?</i> | 5. What feature(s) of the exhibit contribute to keeping the visitor's interest engaged once s/he starts to use it? What feature(s) work against continuing engagement? | | Q 2, 4 | Q 7 |
| | 6. For how long does the visitor engage with the exhibit? | | √ Time | |
| | 7. During this time, in what activities does the visitor engage? (eg. operating controls, observing changes, reading instructions, following instructions, reading explanatory text, talking about the exhibit and the concept it demonstrates with (an)other visitor(s).) | | √ (Behaviour comment) | |
| <i>How effective are the exhibit cues?</i> | 8. Is the exhibit's text perceived as easy to understand? interesting? informative? laid out in a way which is attractive and easy to follow? Is there enough information, or too much or too little? | | | Q 3, 4, 6 |
| | 9. If there are illustrations on the text panel, what messages do these communicate? Are they seen as contributing to the visitor's understanding of what the exhibit is about? | | | Q 2, 4, 6 |
| | 10. If there is sound associated with the exhibit, does this contribute to the visitor's understanding of what is going on? If the sound is spoken text, is it easy to understand? interesting? informative? enough information, or too much or too little? | | Q 4 | Q 2, 4, 5 |
| <i>How well do visitors understand the exhibit message?</i> | 11. Is the exhibit's title seen as appropriate? (eg. intriguing ... giving a clear message as to what the exhibit is about...) | | | Q 1 |
| | 12. When starting to use the exhibit, what did the visitor think it was about? How does this perception relate to the stated aims for the exhibit? | | | Q 1 |
| | 13. After finishing an interaction with the exhibit, what does the visitor think was its main message? What did the visitor 'get out of' using the exhibit? How does this relate to the stated aims of the exhibit? | | | Q 2, 3, 4 |
| | 14. Does the exhibit leave the visitor with unanswered questions? If so - what? - Are unanswered questions a source of frustration or a prompt for further exploration (possibly outside the exhibition)? | | | Q 3, 8 |
| | 15. Is the exhibit interesting and enjoyable to use? | | Q 4 | Q 7 |
| <i>How do visitors interpret the relevance of the exhibit?</i> | 16. If more information is desired, would the visitor prefer it to be available on the exhibit itself? or elsewhere in the exhibition? | | | Q 7, 8 |
| | 17. Does the visitor see the exhibit's topic as relevant to their everyday life, or to that of people around them? | | | Q 2, 3, 6 |
| | 18. Does the visitor recognise how the exhibit contributes to the overall theme of the exhibition of which it is a part? | | | Q 2, 3, 6 |

Figure 1. Flow chart of Formative Evaluation Procedure



Steps in the Evaluation Procedure

The three stages of the Formative Evaluation Procedure are shown in a flowchart as Figure 1. This section describes the purpose of each stage and outlines the procedure to be followed. In the next sections, guidelines for the use of each instrument are offered.

Note

The guidelines are written as if the evaluator can recommend modifications to the exhibit and proceed with further evaluation immediately. Often this is not possible because other people's schedules must be considered. Also, the predominance of one kind of visitor (such as school groups) on the day of evaluation may mean that before modification it may be wise to collect further data from a different audience. Common sense must prevail, but at the very least, the evaluation will have drawn the attention of the designer to a potential problem.

Preparation Stage

The purpose of the Preparation Stage is to familiarise you, the evaluator, with the trial exhibit. Without thorough knowledge of the exhibit it is difficult to interpret visitors' behaviour and understanding. Familiarisation should occur when the target exhibit is in place and available for visitor use, even if you have seen it before. As evaluator, you must know what are the objectives of the exhibit in order to judge whether the visitor has "mastered" the operation of the exhibit and experienced the intended outcome(s).

Procedure

1. Obtain a copy of the exhibit's objectives describing the cognitive, affective and physical objectives. Read the objectives and discuss with other evaluators.
2. Examine all cues (graphics and other instructions) to the exhibit, operate all manipulable parts, and explore the potential other uses of the exhibit. From an understanding of the exhibit's objectives, determine how and what the exhibit is presenting.
3. Determine what constitutes mastery of the exhibit and **write it down**.

Stage One: Visitor Behaviour Schedule

The purpose of Stage One is to familiarise you with visitors' use of the exhibit, and to provide an initial assessment of its attractiveness and operation.

Procedure

1. Using the Visitor Behaviour Schedule (see Section 6), record the behaviour of every available (free to interact) visitor passing the exhibit.
2. After observation of 15 visitors, decide whether the exhibit
 - is functioning reasonably well. Go to Exhibit Use Schedule.
 - is unattractive, reason(s) obvious. Make adjustment and repeat Step 1.
 - has no obvious pattern of use. Observe 15 more visitors and reconsider.
 - is obviously unattractive, reason(s) not obvious. Go to cued testing in Step 3.
3. Employ cued testing with the next available visitor, focusing questions on exhibit attractiveness. Continue cued testing until a plan for modification emerges. The exhibit is modified and Steps 1 and 2 repeated.

Stage Two: Exhibit Use Schedule

The purpose of using the Exhibit Use Schedule is to assess reasons for the attractiveness of the exhibit, assess the holding time (time spent at the exhibit), and assess the ease of operation. It also gives information about visitors' behaviour and use of the exhibit.

Procedure

1. Using the Exhibit Use Schedule (see Section 7), observe and interview 10 or 20 available visitors.
2. After 20 interviews (or 10 if pattern has emerged) complete the Exhibit Use Schedule summary sheet to decide whether the exhibit
 - should be modified according to findings and repeat use of the Exhibit Use Schedule.
 - is ineffective and the problem unclear. Go to cued testing, focussing questions on how visitors operate the exhibit. Modify, then repeat use of the Exhibit Use Schedule.
 - is functioning well. Go on to Post Use Interview.

Stage Two: Post Use Interview

The purpose of the Post Use Interview is to assess visitor understanding of the exhibit, assess the perceived relevance of the exhibit, and assess overall reaction to the exhibit.

Procedure

1. Using the Post Use Interview (see Section 8), interview 5 or 10 available visitors.
2. After 10 interviews (or 5 if a pattern has emerged) collate the findings on a summary sheet and use them to decide whether the exhibit
 - should be modified according to the findings and repeat use of the Post Use Interview.
 - is failing and the problem unclear. Go to cued testing, focussing questions on visitors' understanding of the exhibit. Modify and repeat use of the Post Use Interview.
 - is functioning well. Evaluation completed!

Choosing Visitors for Observation or Interview

The overall guideline is to respect the privacy of visitors and interrupt them as little as possible. Random selection of a sample representative of your Centre audience is important for Summative Evaluation. For Formative Evaluation, the "next available visitor" is effectively a random choice. By noting the sex and age range of the visitor who is interviewed, adults, teens and children of both sexes can be included in the sample observed or interviewed.

For Observation

1. The visitor must be available to attend to the exhibit and not otherwise preoccupied.
2. Be aware that a visitor may initially look and ignore but later attend (eg. sees exhibit, but attends to another one first).
3. Treat a return visitor as a new observation only if the visitor has left area and returned.

For Non-Cued Interview

1. Visitors must be approached **before** their attention is taken by something else. Try to approach just as they decide to turn away from the exhibit.
2. Explain that you are trying out new exhibits. Ask if the visitor would answer a few questions to help you and your Centre.
3. Be brief and to the point. Visitors' time is precious to them and you are interrupting their agenda. Be ready to rephrase questions for younger children.
4. You may want to wear a small identification badge, such as your Centre's logo, to "legitimise" yourself and your task.

For Cued Testing

1. Approach available visitors when they reach the area but have yet to become occupied. Alternatively, you could approach available visitors outside the gallery and lead them into gallery. If they want to bring a friend/partner, this is fine, but interview them separately. Group/Social interviews are possible and sometimes desirable, depending on the nature of the exhibit. For example, some exhibits, like Whispering Dishes, need two people to make them work.
2. Explain you are trying out new exhibits. Ask if the visitor would spend a few minutes to help you.
3. Interviews over five minutes can be rewarded with a voucher for a drink or icecream from the canteen or perhaps a stick-on badge. Use your judgement to decide whether a reward is appropriate. Some visitors simply enjoy talking to someone about the exhibit!

Guidelines for Use of the Visitor Behaviour Schedule

Description

The Visitor Behaviour Schedule is used to record the behaviour of up to 30 visitors who are available to interact with the target exhibit. In the schedule

- the sex and age group of the visitor are coded.
- visitor behaviour is coded in four levels of involvement with the exhibit: *ignore*; *attend*; *engage*; *use successfully* (see glossary for definition of terms).
- interaction between visitors can be coded by lines and arrows, if desired.

The schedule is sufficiently flexible for observers to code a sequence of interaction and behaviour between visitors, but this may be considered additional to its evaluative purpose.

Use

1. Position yourself unobtrusively where the target exhibit is in full view.
2. When an available visitor comes within two metres of the exhibit, code his/her sex and age range as
 - M = Male adult
 - F = Female adult
 - B = teen Boy
 - G = teen Girl
 - b = boy
 - g = girl
3. Each available visitor's responding behaviour is recorded as *ignore*, *attend*, *engage*, *use successfully* (see glossary) by writing the visitor's code (eg. M, F, etc) into the matching box in the column.
4. Each column records one visitor only at the highest level of involvement.
5. Interaction between visitors can be recorded by joining the visitor codes by
 - lines* if visitors are together but do not interact (eg M — F)
 - one way arrows* if one visitor watches another (eg M → F)
 - two way arrows* if visitors interact (eg M ↔ F)
6. As soon as recording is completed for one visitor/visiting group, begin coding the next visitor.
7. Notes related to exhibit design and operation can be made in the comments section, for example, difficulty experienced in operation, comments made by visitors, suggestions for improvement.

Interpretation of Results

1. Total the number of visitors for each type of behaviour.
2. Compare the totals with an ideal pattern. This may be set prior to evaluation and according to the nature of the exhibit. A general guide is:
 - If more than one third (ie more than 10 out of 30) ignore the exhibit, it is not attractive.
Ideally everyone attends, but realistically and depending on the time of day, any exhibit will be ignored by some people.
 - More than two thirds should at least attend to the exhibit. Ideally everyone who attends would engage with and use the exhibit successfully.
 - At least 90% of those who engage should be able to use the exhibit successfully.
 - The exhibit may be attractive but unsuccessful (less than half those operating the exhibit used it as intended).
3. In terms of how successful use of the exhibit has been defined in the Preparation Stage, make a decision on the exhibit's attractiveness and operation. Make comments and/or recommendations about what to do next. For example, if the exhibit is unattractive and the reason is obvious, then modification(s) can be made and observation repeated. If the exhibit is unattractive and the reason is not obvious, try cued testing to find the reason and get suggestions about how the exhibit could be made more attractive to visitors.

Example of Use

On the next page is an example of a completed Visitor Behaviour Schedule for an exhibit called *Spider Magic*, a computer interactive which uses a touch sensitive screen. For example, it can be seen that Visitor #7 was an adult male who watched two girls (Visitors # 8 and #9) engaging with the exhibit, one of whom used it successfully. The exhibit is attractive (26 of 30 visitors interacted with it) but less than half were successful, evidently because it responded too slowly and visitors got bored. The evaluator has recommended two changes aimed at prolonging visitor interaction.

Visitor Behaviour Schedule

Exhibit: *Spider Magic - Computer Interactive*
 Observer: *Léonie* Date: *9-11-95*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | Sub-total |
|--------------|---|-----|---|-----|---|---|---|---|---|----|----|-----|----|----|----|-----------|
| Ignore | M | | | | | g | | | | | | | | | | 2 |
| Attend | | F-F | | | | | M | | | | | | | | | 4 |
| Engage | | | | | | | | | | F | | | | | | 2 |
| Use | | | | | | | | | | | | | | | | |
| Successfully | | | | b↔B | | | | | | | | b↔B | M | B | | 7 |

Sex and Age Range:
 M Male adult
 F Female adult
 B teen Boy
 C teen Girl
 b boy
 g girl

| | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | Sub-total |
|--------------|----|----|-------|----|-----|----|----|----|----|----|----|----|----|-----|----|-----------|
| Ignore | F | | | | | | | | | | | | | | | 4 |
| Attend | | M | | | | | | | | | | | | | | 7 |
| Engage | | | B↔B↔B | | | | | | F | | | | | | | 7 |
| Use | | | | | | | | | | | | | | | | |
| Successfully | | | | | g↔g | | | | | | | | | g↔g | | 5 |
| | | | | | | | | | | | | | | | | 5 |
| Total | | | | | | | | | | | | | | | | 12 |

Interaction Code:
 M — F
 M and F together
 M → F
 M watches F
 M <→ F
 M interacts with F

Comments on visitor behaviour:
*Exhibit attracts attention, most visitors willing to interact.
 Screen slow to respond when touched, visitor sometimes
 walks off before finished.*

Summary Recommendations:
*Screen reaction time slow. Need to speed it up.
 Section of screen to be touched needs to be marked more
 clearly so that visitor gets response.*

Guidelines for Use of the Exhibit Use Schedule

Description

This observation and interview schedule is used to record one visitor's response to the target exhibit.

- A visitor who does not attend to the exhibit is asked how it could be changed to make it more appealing/attractive.
- A visitor who attends, engages or uses the exhibit successfully is asked why the exhibit is attractive, whether and why their engagement is maintained, and how they knew how to use it.
- The sex, age range and group membership of the visitor are coded.
- Attending time is measured by a stop watch and recorded.
- The visitor's behaviour is recorded.

Before you begin

Examine the Exhibit Use Schedule carefully. Depending on the exhibit you are evaluating, you may wish to reword questions slightly to fit the exhibit. When you interview children, simplify the questions and be ready to rephrase them if the young visitor does not understand.

Use

1. Position yourself unobtrusively with the target exhibit in full view and readily accessible.
2. When the first available visitor comes within two metres of the exhibit, determine whether his/her behaviour is classified as ignore or attending (which may become "engage" or "use successfully").
3. If the behaviour is attending, start a stop watch. Continue to observe and record the nature of the behaviour and interaction on the schedule. If the behaviour is non-attending ("ignore"), proceed to next step.
4. Immediately the behaviour ceases, stop the stop watch if in use, and step towards the visitor saying
*"Excuse me, we are trying out some new exhibits.
Please could you help us by answering a couple of questions about this one."*
5. If the visitor agrees, ask the appropriate questions on the schedule and record the answers using key words only to save time. Simplify questions for young children. (Be aware that the visitor may respond to one question and include the answer to another.)

6. The interview should take no more than 90 seconds, and the visitor is thanked.
7. Code the sex and age range of the visitor and membership of any group, circling the person interviewed (eg M F g g)
8. Record the holding time in seconds for an attending visitor and reset the stop watch.
9. Check that interview record is complete and fill out the details of your brief notes. Additional notes can be made in comment section.
10. A clean schedule is begun for the next available visitor. Continue until at least 10 visitors have been interviewed.
11. After 10 interviews, summarise the results on the summary sheet. If a clear pattern has not emerged, target the next 10 visitors according to sex and age range as required. By 20 interviews, aim to get at least three respondents from each of the sex by age range groups.

Interpretation of Results

After each set of interviews, or earlier if a clear pattern has emerged, complete the transfer of results to the summary sheet. Use key words only to save space and allow similar answers to be clustered and tallied. Calculate the exhibit holding time for those visitors who attend, engage or use the exhibit successfully.

Use the summary sheet to decide whether to

- modify the exhibit according to findings, and repeat interviews.
- use cued testing if visitors are unable to operate the exhibit successfully and the problem is unclear.
- move to the next stage without modification.

Example of Use

On the next page is an example of a completed Exhibit Use Schedule for an exhibit about spiders called *Spider Magic*, a computer interactive which uses a touch sensitive screen. It is the result of observation and interview of an adult female, who was accompanied by two girls and a boy. She engaged with the exhibit, helped by her son, but did not use it successfully, leaving before the screen cycle finished.

The following page shows a summary sheet for 10 visitors who attended to the exhibit in some way and two who ignored it. The average holding time was nearly one minute for the 10 people who attended to the exhibit. Only three were able to use it successfully. The exhibit works best for one person, although it seems a visitor can be assisted to use it. Visitors' reactions are generally positive although the slow screen response time is a problem. The evaluator has recommended this be fixed and the Post Use Interview be used to assess visitor understanding of the exhibit.

| | |
|---|--|
| Exhibit Use Schedule | Exhibit: <u>Spider Magic</u> |
| | Interviewer: <u>Leonie</u> Date: <u>9.11.95</u> |
| Composition of Visitor Group: <u>Fgg b</u> (circle person interviewed) Visit Time: <u>80</u> (seconds) | |
| Key: M= Adult male F=Adult female B=teen Boy G=teen Girl b=boy g=girl | |
| Behaviour: | Ignore Attend <u>Engage</u> Use Successfully (circle as observed) |
| Cooperation in Group: | <u>Yes</u> No Comment: <u>son helped mother</u> |
| Interaction: | <u>Look</u> <u>Talk</u> <u>Read</u> <u>Manipulate</u> Demonstrate (circle as observed) |
| Behaviour Comments: <u>Began to interact, son showed how, walked away to follow children before screen finished</u> | |

Non-attending:

1 Would you mind looking at this exhibit for a moment? Does it interest you?

.....

2 How could we change it to make it more appealing for visitors?

.....

.....

.....

Attending:

3 What made you notice this exhibit?

Interesting picture on screen
Heard voice say "try me"

4 Is there something you liked about it? What was it?

Voice feedback when touching screen

5 Is there something you weren't happy with? What was it?

.....

.....

6 How did you know how to use it?

Read the screen, then son helped as he had used it earlier

7 Do you have any other comments?

"I don't like spiders much!"

.....

| | |
|--|---|
| Summary Sheet: Exhibit Use Schedule | Exhibit: <i>Spider Magic</i> |
| | Interviewer: <i>Leonie</i> Date: <i>9.11.95</i> |

Non-attending Visitors: Reasons for not attending:

*Did not hear voice, not interested
(some people just don't like spiders)*

Comments and Recommendations:
*Increase voice cue "eng me" to two minutes
(from five minutes) when not in use*

Attending Visitors:

Visitors are attracted by:
*screen picture III (3) colourful spider in web II (2)
voice cue III (3)*

Features enjoyed by visitors are:
*colour III (3) text story about web II (2)
voice feedback III (3)*

Features NOT enjoyed by visitors are:
slow response of screen when touched III (6)

Visitors knew how to use the exhibit because:
*saw son use (1) used touch screens before IIII (4)
read text on screen III (3)*

Summary of Exhibit Holding Time

| Visitor | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total | Average |
|----------------|----|----|----|---|----|----|----|----|----|-----|-------|-------------|
| Time (seconds) | 80 | 10 | 17 | 5 | 48 | 64 | 33 | 52 | 19 | 133 | 561 | +10 56.1 |

Summary of Interviewees

| Sex | Tally | Total |
|-----|---------------------|--------|
| M | ✓ 2 3 4 5 6 7 8 9 | 1 |
| F | ✓ 2 3 4 5 6 7 8 9 | 2 |
| B | ✓ 2 3 4 5 6 7 8 9 | 1 |
| G | ✓ 2 3 4 5 6 7 8 9 | 2 |
| b | ✓ 2 2 2 2 5 6 7 8 9 | 4 |
| g | ✓ 2 3 4 5 6 7 8 9 | 2 = 12 |

Summary of Interaction

| Interaction | Tally | Total |
|-------------|-------------------------|-------|
| Look | ✓ 2 2 2 2 2 2 2 2 2 2 2 | 8 |
| Talk | ✓ 2 3 4 5 6 7 8 9 10 | 2 |
| Read | ✓ 2 2 2 2 5 6 7 8 9 10 | 4 |
| Manipulate | ✓ 2 2 2 2 2 2 2 2 2 2 2 | 8 |
| Demonstrate | ✓ 2 3 4 5 6 7 8 9 10 | 2 |

Tally for Behaviour: Ignore *II* Attend *II* Engage *III* Use Successfully *III*

Tally for Cooperation in Group: Yes *III* No *III* Comment: *individual use best*

Comments and Recommendations:
*Reduce screen response time
go on to Port Use Interview to find out whether
visitors are understanding the exhibit's message*

Guidelines for Use of the Post Use Interview

Description

This interview schedule is used to record the responses of one visitor who has interacted with the target exhibit.

- The sex, age range and group membership of the visitor are coded.
- Behaviour is noted briefly.
- The visitor is questioned about the effectiveness of exhibit cues, their understanding of the exhibit's message, its relevance to them, and the visitors' interest and enjoyment.
- The degree to which the visitor has mastered the exhibit is decided after the interview.
- Questions can be modified or new questions substituted in order to focus on specific features of particular exhibits.

Use

1. Position yourself unobtrusively with the target exhibit in full view and readily accessible.
2. Target the first available visitor who has interacted with the exhibit. Record their age, sex and behaviour while they are using the exhibit.
3. Immediately the interaction ceases, step towards the visitor saying
*“Excuse me, we are trying out some new exhibits.
Please could you help us by answering a couple of questions about this one.”*
4. If the visitor agrees, ask the interview questions and record the answers using key words only to save time.
5. Continue asking questions, probing for elaboration of responses if required. Note that the visitor may give information about questions not yet asked, so think quickly! Be alert to any suggestions for improvement the visitor can make.
6. Thank the visitor, then go through your recorded responses, filling out details that you didn't have time to write in full during the interview.
7. Decide whether the visitor has mastered the exhibit, that is, the visitor knows how to operate it and understands its message.

Interpretation of Results

After 10 interviews, or earlier if a clear pattern has emerged, complete the transfer of results to the summary sheet. Use key words only, so that similar answers can be clustered by tally.

Use the summary sheet to decide whether

- to modify the exhibit according to findings, and repeat interviews.
- to use cued testing if visitors are unable to master the exhibit and the problem is unclear.
- the evaluation is complete!

Write in your comments and recommendations. Be specific. Don't just write "make instructions better", identify what part of the instructions is not working and describe the problem.

Example of Use

On the next page is an example of a completed Post use Interview for an exhibit about spiders called *Spider Magic*, a computer interactive which uses a touch sensitive screen. The interview was with a boy who interacted with the exhibit but didn't wait until it finished its cycle. He was not particularly interested in spiders, but some useful information was gained.

The following page shows a summary sheet for 10 visitor interviews. Most visitors who interact with the exhibit are gaining at least a partial idea about the exhibit's message, and the evaluator has recommended the message be made more central to the graphics. Screen speed and size of text are other issues identified for attention.

| | | |
|---|--|----------------------|
| Post Use Interview | Exhibit: <u>Spider Magic</u> | Date: <u>9-11-95</u> |
| | Interviewer: <u>Léonie</u> | |
| Composition of Visitor Group: <u>M b (b)</u> (circle person interviewed) Key: M= Adult male F=Adult female B=teen Boy G=teen Girl b=boy g=girl | Based on interview, has visitor achieved mastery? | |
| Behaviour: <u>Engage</u> Use Successfully (circle as observed) | <u>No</u> Partial Yes (circle based on responses) | |
| Behaviour Comments: <u>left before finished</u> | | |

- 1 When you first saw the exhibit, what did you think it was about?
game about Spiderman
- 2 Now that you have used it, what do you think it was about?
spiders in your garden
- 3 Did the exhibit remind you of anything?
saw a red back in the toilet at the farm
- 4 Can you tell me something you found out from using the exhibit?
some spiders aren't poisonous
- 5 Do you think other visitors will find it easy to use? Yes/No
What could we change to make it easier?
Don't know
- 6 Do you think other visitors will understand the exhibit? Yes/No
What could we change to make it better?
Make it work quicker
- 7 Do you think visitors will find it interesting? Yes/No Maybe
What could we change to make it more interesting?
Make it more like spiderman comics
- 8 Does the exhibit tell you enough about the topic? Yes/No
Would you like to learn more? Yes/No How could we help you to find out more?
like frogs better than spiders

Summary Sheet: Post Use Interview

Exhibit: Spider Magic

Interviewer: Léonie Date: 9.11.95

Tally for Persons Interviewed: M 11 F 1 B 11 G - b 111 g 111

Tally for Behaviour: Engage 1111 (6) Use Successfully 1111 (4)

Tally for Mastery: No 111 (3) Partial 1111 (4) Yes 111 (3)

1 First impressions of exhibit:

Spiderman comic book 111 (3)
Spiders 111 (3) Dangerous animals 11 (2)

2 Impressions after use:

Something about spiders 111 (3) Spider habitats 111 (3)
Conservation of spiders 11 (2) Spiders can help us 1111 (4)

3 Visitors are reminded of:

Previous experiences with spiders 111 (3)
Film: Charlotte's Web (1) Spiderman 111 (3)

4 Ideas/knowledge developed from using the exhibit:

Not all spiders are dangerous 11 (2) Not all spiders build webs (1)
Spiders eat lots of insects (11) (3)
Spider habitats should be preserved 111 (3)

5 What could be changed to make it easier to use?

Chair to sit on 11 (2)
Need to highlight screen area to be touched (1)

6 What could be changed to make it more easily understood?

Text too small on screen for some people to read (1)

7 What could be changed to make it more interesting?

Speed up reaction time
show spiders eating their prey (from two kays!)

8 Ideas to learn more about the topic:

Books about spiders in shop. Spider posters
Include advice on screen at end of cycle to inform visitors where to get more information

Recommendations:

- ① Objective is to encourage preservation of spiders and their habitats - only 3 of 10 got this message. Devise test graphic to emphasise.
- ② Speed up reaction time

Introduction to Cued Testing

Cued testing occurs when visitors are asked to examine and use an exhibit and are told beforehand that they will be questioned about it. Visitors are frequently more motivated to examine the exhibit carefully when they know they will be questioned about it afterwards. Sometimes a small reward is offered in appreciation for giving you their time.

Cued testing is used when the focus of evaluation is to understand how visitors use or operate the exhibit and comprehend its message. Particular focus can be placed on specific cues related to the exhibit (for example, the effectiveness of the graphics) or on identifying the difficulties visitors have operating the exhibit. Sometimes the visitor is asked questions after finishing with the exhibit, other times it may be more effective to interact with the visitor as he/she uses the exhibit in a think-aloud way. Usually interviewing one-to-one is best, unless the exhibit needs more than one person to operate it.

Cued testing is only effective when the evaluator thoroughly understands the exhibit and its purpose, and the visitor is relaxed and honest in his or her appraisal. Considerable skill is required because the evaluator has to be able to assess the visitor's responses quickly and formulate follow-up questions, as well as keeping the visitor at ease. Practice helps!

Each exhibit and occasion of cued testing may require different questions, so there is no single set of rules to follow. However, the following is given as a general guide:

1. Know how the exhibit is supposed to work, and what the visitor is expected to learn.
2. Know the purpose of cued testing for the particular exhibit and prepare a set of outline questions based on this purpose.
3. Observe how the visitor uses the exhibit because alternative ways of using it may become evident, or the visitor may misunderstand the cues for its use.
4. Ask questions which probe, don't prompt by putting words into the visitor's mouth. Listen carefully to the visitor's responses. Be ready to deviate from the prepared questions in response to the visitor's replies, and watch out for unexpected findings.
5. Place the visitor in the role of an expert whose advice you are seeking. Ask "do you think other visitors will understand this?" rather than "do you understand this?"
6. Be considerate of visitors' own needs and thank them for helping you in your task of improving the exhibit.

Appendix I: Glossary of Terms

- Available Visitor:** Visitor is "available" to interact with the exhibit and is not engaged in some other task, eg. group management, moving purposefully to another place. Watch carefully when the exhibit is close to a main thoroughfare. Available visitors are a bit like "window shoppers" looking for something that interests them.
- Ignore:** Visitor passes within two metres of exhibit but fails to attend.
- Attend:** Visitor looks at exhibit, stops with both feet still for at least two seconds. May watch others use (from a distance). Visitor is passive.
- Engage:** Attending Visitor is active, eg seeks information from exhibit (eg looks intently, reads or makes verbal comments) or attempts to operate (eg touches, manipulates).
- Use Successfully:** Visitor operates exhibit in the way it is intended. May repeat operation or explore other possible uses, develop "new" games.
- Mastery:** Visitor operates the exhibit successfully and comprehends its message. Sometimes visitors master only part of the message, and achieve partial mastery. Often it is not possible to be sure the visitor has achieved mastery by observation alone.
- Cued Testing:** Cued testing is a procedure where the visitor is asked beforehand to study the exhibit and then respond to the evaluator's questions.
- Non-cued Testing:** Visitor is observed unobtrusively concerning their behaviour at exhibits.
- Holding Time:** Time spent by visitor at exhibit.

Appendix II: Master Copies of Instruments

Visitor Behaviour Schedule

Exhibit Use Schedule

Exhibit Use Schedule – Summary Sheet

Post Use Instrument

Post Use Instrument – Summary Sheet

Visitor Behaviour Schedule

Exhibit: _____

Observer: _____

Date: _____

| | | | | | | | | | | | | | | | | |
|--------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|-----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | Sub-total |
| Ignore | | | | | | | | | | | | | | | | |
| Attend | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| Engage | | | | | | | | | | | | | | | | |
| Use | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| Successfully | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |

Sex and Age
 Range: M Male adult
 F Female adult
 B teen Boy
 G teen Girl
 b boy
 g girl

| | | | | | | | | | | | | | | | | |
|--------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------|
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | Sub-total |
| Ignore | | | | | | | | | | | | | | | | |
| Attend | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
| Engage | | | | | | | | | | | | | | | | |
| Use | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
| Successfully | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
| Total | | | | | | | | | | | | | | | | |

Interaction Code
 M → F
 M and F together
 M →→ F
 M watches F
 M <→→ F
 M interacts with F

Comments on visitor behaviour:

Summary Recommendations:

| | |
|---|---|
| Exhibit Use Schedule | Exhibit: _____ Interviewer: _____ Date: _____ |
| Composition of Visitor Group: _____ (circle person interviewed) Visit Time: _____ (seconds) <small>Key: M= Adult male F=Adult female B=teen Boy G=teen Girl b=boy g=girl</small> | |
| Behaviour: Ignore Attend Engage Use Successfully (circle as observed) | |
| Cooperation in Group: Yes No Comment: _____ | |
| Interaction: Look Talk Read Manipulate Demonstrate (circle as observed) | |
| Behaviour Comments: _____ _____ _____ | |

Non-attending:

1 Would you mind looking at this exhibit for a moment? Does it interest you?

2 How could we change it to make it more appealing for visitors?

Attending:

3 What made you notice this exhibit?

4 Is there something you liked about it? What was it?

5 Is there something you weren't happy with? What was it?

6 How did you know how to use it?

7 Do you have any other comments?

| | |
|--|--------------------------------|
| Summary Sheet: Exhibit Use Schedule | Exhibit: _____ |
| | Interviewer: _____ Date: _____ |

Non-attending Visitors: Reasons for not attending:

| |
|--------------------------------------|
| Comments and Recommendations: |
| |

Attending Visitors:

Visitors are attracted by:

Features enjoyed by visitors are:

Features NOT enjoyed by visitors are:

Visitors knew how to use the exhibit because:

Summary of Exhibit Holding Time

| Visitor | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total | Average |
|----------------|---|---|---|---|---|---|---|---|---|----|-------|---------|
| Time (seconds) | | | | | | | | | | | +10 | |

Summary of Interviewees

| Sex | Tally | Total |
|-----|-------------------|-------|
| M | 1 2 3 4 5 6 7 8 9 | |
| F | 1 2 3 4 5 6 7 8 9 | |
| B | 1 2 3 4 5 6 7 8 9 | |
| G | 1 2 3 4 5 6 7 8 9 | |
| b | 1 2 3 4 5 6 7 8 9 | |
| g | 1 2 3 4 5 6 7 8 9 | |

Summary of Interaction

| Interaction | Tally | Total |
|-------------|----------------------|-------|
| Look | 1 2 3 4 5 6 7 8 9 10 | |
| Talk | 1 2 3 4 5 6 7 8 9 10 | |
| Read | 1 2 3 4 5 6 7 8 9 10 | |
| Manipulate | 1 2 3 4 5 6 7 8 9 10 | |
| Demonstrate | 1 2 3 4 5 6 7 8 9 10 | |

Tally for Behaviour: Ignore _____ Attend _____ Engage _____ Use Successfully _____

Tally for Cooperation in Group: Yes _____ No _____ Comment: _____

| |
|--------------------------------------|
| Comments and Recommendations: |
| |

| | |
|---|---|
| Post Use Interview | Exhibit: _____ |
| | Interviewer: _____ Date: _____ |
| Composition of Visitor Group: _____ (circle person interviewed) Key: M= Adult male F=Adult female B=teen Boy G=teen Girl b=boy g=girl | Based on interview, has visitor achieved mastery? No Partial Yes (circle based on responses) |
| Behaviour: Engage Use Successfully (circle as observed) Behaviour Comments: _____ | |

- 1 When you first saw the exhibit, what did you think it was about?

- 2 Now that you have used it, what do you think it was about?

- 3 Did the exhibit remind you of anything?

- 4 Can you tell me something you found out from using the exhibit?

- 5 Do you think other visitors will find it easy to use? Yes/No _____
 What could we change to make it easier?

- 6 Do you think other visitors will understand the exhibit? Yes/No _____
 What could we change to make it better?

- 7 Do you think visitors will find it interesting? Yes/No _____
 What could we change to make it more interesting?

- 8 Does the exhibit tell you enough about the topic? Yes/No _____
 Would you like to learn more? Yes/No How could we help you to find out more?

Summary Sheet: Post Use Interview

Exhibit: _____

Interviewer: _____ Date: _____

Tally for Persons Interviewed: M _____ F _____ B _____ G _____ b _____ g _____

Tally for Behaviour: Engage _____ Use Successfully _____

Tally for Mastery: No _____ Partial _____ Yes _____

1 First impressions of exhibit:

2 Impressions after use:

3 Visitors are reminded of:

4 Ideas/knowledge developed from using the exhibit:

5 What could be changed to make it easier to use?

6 What could be changed to make it more easily understood?

7 What could be changed to make it more interesting?

8 Ideas to learn more about the topic:

Recommendations:

Appendix III: Pilot Evaluation of *Gold Hunter*

During the development of this handbook, draft versions of the evaluation instruments were tried out at Questacon, where a small group of staff and volunteer explainers used them to explore visitor reactions to two prototype exhibits. To illustrate the nature of the information which can be gained using the instruments in this handbook, the results for the formal evaluation of one of these prototypes are included here, including samples of observation and interview record sheets and a report summarising and analysing the results.

The exhibit available for the pilot evaluation was *Gold Hunter*. This is a computer-based exhibit challenging visitors to find a gold deposit by following an invisible chemical trail. The exhibit will, in its final version in the *WildScience* exhibition, be complemented by a partner exhibit illustrating how moths track invisible scent trails to find a mate. The final version of *Gold Hunter* is to have a graphics panel permanently visible as well as text and visuals on the computer screen. The location of the gold deposit will vary randomly.

The Concept Addressed by the Exhibit

Substances which spread out from a source can often be traced back to that source by following a concentration gradient: the farther from the source, the lower the concentration. In this exhibit, the concept is illustrated by traces of gold (or some other valuable metal) in riverbed sediments downstream from a near-surface source deposit.

The Exhibit

The exhibit comprises a model landscape with a number of holes representing mineral sampling/drilling sites. The visitor is challenged to locate the gold deposit by inserting a probe into a succession of holes and either sampling or drilling for gold. The challenge is to find the gold before the exploration budget runs out – a logical approach will, in general, be more likely to achieve this than a random hunt.

A computer screen provides instructions for the use of the exhibit, and feedback when the visitor carries out sampling or drilling. The feedback is via numbers representing concentrations on a map (on the screen) replicating the model landscape they are exploring. Buttons are provided to select 'sampling' or 'drilling' at each chosen site.

Three Hierarchies of Objectives for the Visitor's Use of the Exhibit

The following objectives were prepared by Questacon to describe how the visitor might use the exhibit.

Physical – manipulating the exhibits

- inserts the probe into one or more of the holes in the model landscape OR presses one or both buttons
- uses both probe and button(s), but in a random sequence
- inserts the probe into a test site, presses one of the buttons ('sample' or 'drill') and watches for feedback on the computer.
- carries out a sequence of probe – button – probe – etc, and watches for feedback on the computer each time.

Cognitive – understanding the concept

- chooses testing sites in a random way
- recognises the correspondence between the model of the river system and the map on the computer screen
- is aware that the concentration of gold in river sand can be measured
- realises that higher gold concentrations on the samples indicate they are closer to the deposit
- understands that searching, sampling and drilling for gold incur costs
- understands that a logical sampling strategy can lead to a quicker result at a lower total cost
- knows that exploration and mining only brings financial rewards if the value of the mined metal is greater than the cost incurred in obtaining it.

Affective – developing an interest and/or positive attitude

- sees the exhibit as an enjoyable game for short-term amusement
- shows curiosity, interest in the concept of following the chemical trial
- shows interest in playing the game in a logical rather than a random way to achieve a good result
- relates the experience with the exhibit to prior knowledge/attitudes or shows some interest in knowing more about the topic

Description of the Exhibit at the Evaluation Stage

The first prototype version, which was the subject of evaluation, was at a stage of development where many of the key components were present: instructions and explanations on the computer screen, and the means for physical interaction with the model landscape. It was however, at a sufficiently early stage of development – both the computer and the physical staging – that changes could be made in response to the evaluation relatively inexpensively before the final graphics and housing are prepared.

In the prototype version, the computer screen was mounted on a small flat rectangular surface bearing a coloured map of the landscape, dotted with fitted brass holes to take a sampling/drilling probe. The buttons labelled *Restart*, *Sample*, *Drill* were mounted at the front of the surface. The computer was enclosed by a temporary untreated wooden housing for protection. The gold deposit was at a fixed site, some of the computer graphics were at an early stage of development and the non-screen-based graphics were not included. The computer screen initially showed the title *Gold Hunter!* Once the program began, the rules were shown followed by the river landscape and the sampling/drilling sites. Visitors picked up the probe and placed it in a hole. The sound of an outboard motor was heard and the screen graphics showed travel along a river. The sound stopped and a dialogue box on the screen asked the visitor whether they wished to sample or drill at this site. The visitor was advised as part of the rules of this game that the initial exploration budget was \$20,000; it cost \$200 for each sample and \$4,000 to drill. As sampling, drilling and travel between numbered sites occurred, the depletion of the exploration budget was shown on the screen.

Preparation Stage

The evaluators examined the exhibit and considered its objectives. It was decided that visitors would use the exhibit successfully if they were able to locate the gold deposit before their exploration budget was spent, using a logical sequence of sampling or drilling. Mastery would require understanding the concepts presented as well.

During the time spent becoming familiar with the exhibit a few problems were noted.

1. The stylised river landscape could be either a river delta system which flowed towards the visitor or a system of tributaries forming a major river which flowed away from the visitor. The direction of river flow shown on the screen indicated flow towards the visitor, ie. a delta system, however, the exhibit operated as a tributary system. Further, the text for direction of flow was rotated 90° and was difficult to read.
2. At the beginning, the *restart* button was pushed and the video screen opened with the initial text and advice to *press any button* to continue. This included the *restart* button, which if pressed resulted in the user being returned to the title screen.

3. The video screen showing the river landscape with the numbered sites had the probe location 8 numbered as 2, and this did not match the numbering on the table landscape.
4. As the user moved between sample sites, funds were deducted as transport costs. These transport costs were not explained in the rules and no advice was provided about how they are calculated. This resulted in funds being mysteriously and rapidly depleted.
5. It was possible either to sample or to drill during each site visit. The user had to move to another site and then move back to the original site in order to both sample and drill.
6. The exhibit required a chair for sitting, as the table was low and operation was difficult from a standing position. The chair provided was a single seat, whereas a bench stool, which could accommodate up to three visitors, would be more appropriate.

Stage One

Use of the Visitor Observation Schedule

A completed Visitor Observation Schedule is shown. The results indicate that the exhibit is attractive to visitors with no one ignoring the exhibit. Of the 30 visitors, 10 only attended to it, three of whom watched another person use it. Nineteen of the 20 visitors who engaged with the exhibit were not able to find the gold. They were able to manipulate the probe, push buttons and engage in sampling or drilling. Success was elusive for all but one of the users who was able to locate the gold deposit in an apparently logical way.

The evaluator's comments on the Visitor Observation Schedule indicates that the visitors were doing all they could in attempting to get the exhibit to work, but usually ran out of funds. This was related to the rapid consumption of funds for travel, a problem noted in the preparation stage. As visitors often use the exhibit as a group, a bench seat rather than a single chair should be provided. Because the exhibit was obviously attractive to visitors and they could manipulate it as intended, Stage Two was initiated.

Stage Two

Use of the Exhibit Use Schedule

During Stage Two the Exhibit Use Schedule was used with 12 visitors and the summary page is shown. The two non-attending visitors reported that the exhibit required too much reading, as during their visit, the rules rather than the title screen were on display. The ten attending visitors were attracted by the label of *Gold Hunter*, the title screen which suggested that the exhibit may be some type of game, the presence of the cable and probe on the table, and the social nature of the exhibit (two or more can engage in the hunt for the gold deposit). These visitors reported that they enjoyed the competitive nature of the exhibit, spending money, the simulation game approach, using a probe to search for gold and winning.

Many of the visitors reported that they did not know exactly what to do as the rules were shown only once at the beginning. Visitors observed site sample scores on the screen but did not usually understand what the gold sample scores actually mean. For example, is a score of 140 high, after you have a previous score of 80? Some of the attendees were in groups who together attempted to search for the gold deposit, and the evaluator reports that the exhibit is a good social activity. The average holding time was 207 seconds, over three minutes, but only one visitor was successful in locating the gold. Visitors reported that they were able to operate the exhibit either by reading the text (n=7) or by trial and error (n=3). Some visitors reported that they disengaged with the exhibit before succeeding as there was a queue to use the exhibit and they had already had their attempt.

The data from the Exhibit Use Schedule indicate that visitors enjoyed using the exhibit, particularly the competitive nature with the chance to win and discover the gold deposit. Many of the visitors experienced difficulty understanding the rules, as these were displayed only at the beginning, and could be viewed once only. Visitors reported that they were unsure about what to do. Possibly the rules could be displayed as a graphic near the plaque showing the exhibit title.

Post Use Interview

The Post Use Interview was used with eight visitors to determine the outcomes of using the exhibit. The summary sheet is shown. Most visitors understood that the exhibit was a simulation of searching for a gold deposit. Many understood that the activity of prospecting for gold involved the activities of drilling, sampling and travelling across the landscape. Five visitors knew that gold is usually found in river deposits. Four visitors reported that they required better instructions or simple rules. Although no visitor complained about their failure to locate the ore body, one requested a better chance of finding gold. This would occur if the available funds were not depleted so quickly by travel. One visitor stated that the map graphic on the table was of a river delta, and believed the river was flowing towards him (as indicated on the screen but opposite to what actually occurs in the sequence). One visitor was in a wheel chair and experienced no difficulty in operating the exhibit.

Recommendations

This prototype exhibit requires further refinement and another cycle of evaluation using the Exhibit Use Schedule and/or the Post Use Interview.

1. Revise the landscape to resemble a tributary system more closely, and have the direction of river flow clearly and correctly marked on both screen and table. (Is it possible to have a 3-D diorama which will emphasise the importance of the topography?)
2. The computer program requires modification to address problems relating to:

- use of funds for travel
- matching probe site numbers to those on the table
- allowing sampling and drilling on the same visit to a site
- which buttons to press to continue.

In addition, a faster default to the title page when the visitor departs may make the exhibit more attractive when not in use.

3. Place a copy of the rules for reference at anytime during exhibit use.
4. Install a bench type seat for use of several visitors together.

Visitor Behaviour Schedule

Exhibit: Gold Hunter Date: 27 Nov, 95
 Observer: Jony

| | | | | | | | | | | | | | | | | |
|--------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|-----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | Sub-total |
| Ignore | | | | | | | | | | | | | | | | — |
| Attend | | | | | | | | | | | | | | | | 4 |
| Engage | | | | | | | | | | | | | | | | 10 |
| Use | | | | | | | | | | | | | | | | 1 |
| Successfully | | | | | | | | | | | | | | | | 1 |

Sex and Age Range:
 M Male adult
 F Female adult
 B teen Boy
 C teen Girl
 b boy
 g girl

| | | | | | | | | | | | | | | | | |
|--------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------|
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | Sub-total |
| Ignore | | | | | | | | | | | | | | | | — |
| Attend | | | | | | | | | | | | | | | | 6 |
| Engage | | | | | | | | | | | | | | | | 9 |
| Use | | | | | | | | | | | | | | | | — |
| Successfully | | | | | | | | | | | | | | | | 1 |

Interaction Code:
 M — F
 M and F together
 M → F
 M watches F
 M ←→ F
 M interacts with F

Comments on visitor behaviour:
 ① Many of engaged visitors ran out of money after 3 or 4 sampling activities — funds depleted too fast.
 ② Visitors crowd around exhibit — single chair a problem.

Summary Recommendations:
 ① Provide greater funds in initial exploration budget.
 ② Provide bench next and remove chair.

| | |
|--|--|
| Summary Sheet: Exhibit Use Schedule | Exhibit: <i>Gold Hunter</i> |
| | Interviewer: <i>Marian</i> Date: <i>28/11/95</i> |

Non-attending Visitors: Reasons for not attending:
too much reading - visitors regularly only see screen containing rules.

Comments and Recommendations:
A quicker default to resetting. Gold Hunter title screen should be seen always when not in use.

Attending Visitors:
 Visitors are attracted by:
About gold III (3) Gold & Probe " (2) Friend " (2) Screen Title " (2)
Looked new I (1) Game appearance " (2)

Features enjoyed by visitors are:
Decisions I (1) Spending money I (1) Probe " (3)
Winning I (1) Game " (3)

Features NOT enjoyed by visitors are:
Not understanding what to do. IIII (4)

Visitors knew how to use the exhibit because:
Read labels and graphics III (7)
Trial and Error III (3)

Summary of Exhibit Holding Time

| Visitor | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total | Average | |
|----------------|-----|-----|-----|----|-----|-----|-----|----|-----|-----|-------|---------|-----|
| Time (seconds) | 120 | 280 | 200 | 90 | 120 | 275 | 225 | 80 | 180 | 200 | 2070 | +10 | 207 |

Summary of Interviewees

| Sex | Tally | Total |
|-----|-------------------|-------|
| M | X 2 3 4 5 6 7 8 9 | 2 |
| F | X 2 3 4 5 6 7 8 9 | 2 |
| B | X 2 3 4 5 6 7 8 9 | 1 |
| G | X 2 3 4 5 6 7 8 9 | 1 |
| b | X 2 3 4 5 6 7 8 9 | 4 |
| g | X 2 3 4 5 6 7 8 9 | 2 |

Summary of Interaction

| Interaction | Tally | Total |
|-------------|----------------------|-------|
| Look | X 2 3 4 5 6 7 8 9 10 | 10 |
| Talk | X 2 3 4 5 6 7 8 9 10 | 8 |
| Read | X 2 3 4 5 6 7 8 9 10 | 7 |
| Manipulate | X 2 3 4 5 6 7 8 9 10 | 10 |
| Demonstrate | X 2 3 4 5 6 7 8 9 10 | 4 |

Tally for Behaviour: Ignore " (2) Attend Engage IIII (9) Use Successfully I (1)
 Tally for Cooperation in Group: Yes IIII (7) No III (3) Comment: *Good Group Activity*

Comments and Recommendations:
1. Make rules accessible - suggest a label near exhibit label.

| | |
|--|--|
| Summary Sheet: Post Use Interview | Exhibit: <i>Gold Hunter</i> |
| | Interviewer: <i>Mauian</i> Date: <i>28/11/95</i> |

Tally for Persons Interviewed: M 2 F 2 B 1 G 1 b 1 g 1 = 8
 Tally for Behaviour: Engage 7 Use Successfully 1
 Tally for Mastery: No 7 Partial 1 Yes NIL

- First impressions of exhibit:
Hunting for gold IIII 4 *Hands On* 1 *Drilling* 1
Game 1 *Sampling for water* 1
- Impressions after use:
Gold IIII 6 *Drilling & Sampling* 1 *Water* 1
Sampling 1
- Visitors are reminded of:
Mining IIII 3 *Statistics* 1
Geology class at school 1
- Ideas/knowledge developed from using the exhibit:
Not cleverer enough to find gold 1
Gold found in river locations IIII 5
Table graphic is a river delta (opposite to exhibit intent) 10
- What could be changed to make it easier to use?
More background information 1
Improve table graphic 1
- What could be changed to make it more easily understood?
Simple rules 1 *Better instructions IIII* 3
Better chance of finding gold 1
- What could be changed to make it more interesting?
Better seating - single chair difficult for parent/child or two friends to operate exhibit. Wheel chair user experienced no difficulty in access to probe and buttons.
- Ideas to learn more about the topic:
More information about mining IIII 5
Poster on panel on gold mining method 1 - 1

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| Recommendations: 1. <i>Make instructions and rules available and accessible as you use exhibit.</i> 2. <i>Confusion over map on table surface - change to 3D diorama.</i> |
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Appendix IV: Training Notes

The notes in this section are intended to assist you, as a trainer, to introduce others, the trainees, to the use of the instruments presented in this Handbook. Although the Handbook can be used as a stand-alone package, training is recommended for two reasons. First, it will ensure that the approach and the instruments are being used in a uniform way which fits the needs and operating style of the centre. Second, and this is most important, it provides an opportunity for the group working on the project to discuss the exhibit aims and the evaluation goals. Questions on the instruments can be considered jointly, so decide whether they may need modification to fit the needs of particular exhibits. Such discussion ensures that the feedback collected by different people is consistent and comparable, and therefore of maximum value.

The following notes are based on the experience gained from two training sessions, one led by the authors during the piloting of the instruments, and a second, led by Ilze Groves of Questacon, using the final versions of the instruments.

General Guidelines for the Training Session

Time Required

1. Two half-days or a whole day is the minimum time to cover the three instruments. The first half day would cover preparation/discussion of the objectives and the Visitor Behaviour Schedule, the second would cover the other two instruments.
2. The time required for sessions in the gallery to complete observations and interviews will vary according to how many visitors are present on the day.

Preparation for the Training Session

1. Ideally, the trainees will have their own copy of the handbook and have had time to read it before the session.
2. If the trainees have been able to examine and use the target exhibit(s) before beginning the training session, it will save some time on the day.
3. It is a good idea to warn floor staff that training is in progress, so that the trainees and the visitors they are observing/interviewing are not interrupted unnecessarily.
4. Training requires a room as a base point, with furniture arranged in a conference style.
5. It will make it easier to keep track of the paper during the day if each instrument and summary sheet is printed in a different colour.
6. Trainees will need a pencil and a firm A4 sized clip-board to hold the instruments. Stop

watches are helpful for the Exhibit Use Schedule, but wrist-watches with second hands will suffice.

Understanding the Target Exhibit

1. It is most important is to understand the objectives of the target exhibit. These may include objectives of three kinds, cognitive (head – knowledge and understanding), psychomotor (hands – manipulating) and affective (heart – feelings, values and attitudes). All exhibits have something related to enjoyment, interest, but sometimes there are specific things like attitudes to recycling or to the environment, for which it is important to formulate affective objectives.
2. The objectives have to be translated into a description of what the visitor ought to be doing with the exhibit in order to determine whether the exhibit is working as intended. This aspect is central to the "preparation stage" of evaluation and should be carried out right in front of the exhibit, if that is possible. Each trainee should use the exhibit themselves, at least twice!
3. Note that training can be carried out on existing exhibits if no prototype exhibits are available. If some trainees are also Explainers, impress upon them the need to view a familiar exhibit through 'new eyes'!

Letting the Trainees Have Their Say

1. Make sure the trainees have plenty of opportunity for discussion. It is a good idea to organise the training based on a cycle of "here's what we are going to do, now let's go do it, now let's discuss what we discovered" for each instrument. Discussion after each phase is important because it lets you know how well the trainees understand what they are doing, pick up any misunderstandings or other problems, and most importantly, keep them involved as colleagues.
2. Impress upon the trainees that they are doing a valuable job, and if they feel uncomfortable or self-conscious at first, this will quickly pass as they come to grips with the procedures of the evaluation. Their confidence will rise as they practice and begin to realise how much they are learning about the visitors and the exhibit.
3. Have a reflection session at the end of the training session. Here trainees are able to share insights and experiences and to discuss what they have learned.

Presenting the Instruments

1. Present the instruments and practice using them in the same order as they appear in the Handbook. There are at least two reasons for this. First, as shown in the flowchart in Figure 1 on page 5, they become increasingly more detailed in the information they provide about the exhibits. Second, they become increasingly more dependent on the trainees' interactions with visitors. Some trainees may be shy or anxious at the beginning, and may feel self-conscious about approaching visitors.

2. Impress upon trainees that when they are on the floor, they must leave the visitors to their own devices so that the exhibit acts for itself. Some Explainers may find it hard to curb their desire to assist the visitor! The basic *don'ts* are
 - don't try to attract the visitor to the exhibit
 - don't explain the exhibit (if requested, wait until after observation/interview is complete)
 - don't put words into the mouth of the visitor during interview.
3. Tell trainees to "React to visitors as if you are hanging on their every word! Pause as long as possible, to give visitors plenty of time to answer your question."
4. There are commonsense things to remember like
 - trying to be inconspicuous (but not suspicious!) when observing,
 - being polite,
 - making the visitor feel as if his/her opinion is really valued,
 - not interrupting visitors who don't want to be interrupted.

Sample Program for a Training Session

- 9.00 Introduction
- 9.30 Preparation Stage
- 10.00 Visitor Behaviour Schedule – introduction
- 10.20 Morning Tea
- 10.30 Visitor Behaviour Schedule – gallery work
- 11.20 Visitor Behaviour Schedule – debriefing and discussion
- 11.45 Exhibit Use Schedule – introduction
- 12.00 Lunch
- 12.40 Exhibit Use Schedule – gallery work
- 1.30 Exhibit Use Schedule – debriefing and discussion
- 1.50 Post Use Interview – introduction
- 2.00 Post Use Interview – gallery work
- 2.40 Post Use Interview – debriefing and discussion
- 3.00 Reflections (over coffee) on training session, conclusions

Suggested Content for Each Session

Introduction

- welcome, introductions, outline of the day's program
- overview of evaluation and its purposes
- focus on the model for evaluation used in the Handbook (see Sections 3 and 4)

Preparation Stage

- the importance of understanding what the exhibit is for and knowing what a visitor is supposed to do in order to use the exhibit successfully and understand its message
- explain the three kinds of objectives (cognitive, psychomotor, affective) and write down the objectives for the target exhibit(s). An example of a form which the trainees could use is given at the end of this section.

Introduction to Each Instrument

- when the instrument is used and the information it is designed to provide
- what to do and how to complete the instrument
- for the Exhibit Use Schedule and the Post Use Interview, the possibility of modifying questions to focus on specific aspects of the target exhibit
- how to select visitors for observation/interview and the importance of not interrupting their visit in an unwelcome way

Debrief on Each Instrument

- complete summary sheets
- discuss problems experienced in filling in the forms
- compare findings and discuss their interpretation

Reflections

- highlights and interesting experiences of the day
- feedback for future sessions, etc

Sample Form for Exhibit Objectives

Exhibit Title:

Exhibit Message (what we would like the visitor to go away with):

Three aspects of using and understanding the exhibit:

Physical operation/ manipulation of the exhibit (psychomotor – hands)

-
-
-

For this exhibit, successful use would involve:

Understanding the concept(s) demonstrated by the exhibit (cognitive – head)

-
-
-

Attitude to the exhibit and the information/experience it offers (affective – heart)

-
-
-