CHAPTER 4

Planning and Managing Evaluations

Objectives

After reading Chapter Four, you should be able to:

• prepare a plan for evaluating an interactive learning system during design and implementation;

• carry out the activities required to manage the evaluation of an interactive learning system; and

• establish a documentation system for a project to develop or implement an interactive learning system.

Why plan?

Preparing a detailed evaluation plan is essential before you undertake any facet of evaluation. An evaluation plan is usually a written document that spells out the “who, what, when, where, why, and how” of an evaluation effort. Any given plan will likely go through several stages of revision before it is accepted, and it is likely to be modified during its implementation. Negotiating an evaluation plan with team members, clients, and other relevant audiences represents a major part of the effort you will invest in evaluating interactive learning systems. In fact, once you have developed a well-designed plan and a set of reliable and valid evaluation instruments, it is sometimes possible to turn much of the actual data collection over to others. On the other hand, trying to evaluate without a plan almost always will be disastrous.

Beyond the obvious benefits, an evaluation plan has at least two other distinct advantages. First, the process of preparing a plan helps you understand the size and scope of an evaluation project. You need that understanding to establish a meaningful timeline and a reasonable budget for the evaluation. Second, the planning process gives you an opportunity to establish good rapport with your clients (the people paying for the
evaluation) and other audiences (any people who may use the information provided by the evaluation for decision making).

An evaluation plan template

Figure 4.1 presents a list of the major components of an evaluation plan. An important aspect of this plan template is that it encourages you to identify in advance decisions that must be made about whatever is being evaluated. After all, unless your evaluation is designed to guide or influence decisions, you probably should not bother with evaluating an interactive learning system in the first place. The strategy seems simple, but it is actually quite challenging. Working with your clients and other relevant audiences, you must try to anticipate as many decisions as possible that might be made about the interactive learning system being developed or implemented. For each decision, you then will identify questions that must be answered to help your clients or others make better decisions. Then and only then should you decide upon an evaluation design or select specific data collection methods for the evaluation.

Evaluation planning often requires political savvy and astute negotiation skills. Just as politicians must engage in persuasion and negotiation to get anything accomplished within legislative bodies, evaluators often find themselves in the position of having to persuade their clients of the value of asking certain questions or addressing certain issues in an evaluation. Unwilling or unable to confront the complexities involved in most evaluation contexts, clients and other audiences for evaluation will demand direct and simple answers to complex questions. Experienced evaluators know that direct and simple answers are extremely rare, and that “it depends” and other conditional statements are part of even the best evaluations. A sound evaluation plan will expose as many of these conditionals as possible up-front, but the trick is doing so without having the clients decide to abandon evaluation altogether.
A copy of the evaluation plan template is included in the Web site that supports this book. Parts of a hypothetical evaluation plan are excerpted in this chapter to illustrate the planning process (see Figures 4.2 – 4.15).

<table>
<thead>
<tr>
<th><strong>Introduction</strong></th>
<th>Introduces the major sections of the plan as well as the primary people involved in writing the plan.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background</strong></td>
<td>Describes any information needed to provide the reader with an understanding of the background of the interactive learning being evaluated.</td>
</tr>
<tr>
<td><strong>Purposes</strong></td>
<td>Delineates the purposes of the evaluation. A single plan can address a variety of purposes, but all must be delineated clearly. Evaluation is always a political process and all parties must accept the purposes for the evaluation to be successful.</td>
</tr>
<tr>
<td><strong>Audiences</strong></td>
<td>Specifies the clients as well as all the primary and secondary audiences or consumers of the evaluation. In general, it is recommended to open up the evaluation to as many people or agencies as the client will allow.</td>
</tr>
<tr>
<td><strong>Decisions</strong></td>
<td>Specifies the anticipated decisions that should be influenced by the evaluation. This section is probably the most difficult, but it should be included if the evaluation is to have impact on decision-making. Most developers do not wish to anticipate negative outcomes, but these too must be considered.</td>
</tr>
<tr>
<td><strong>Questions</strong></td>
<td>Clarifies the questions to be addressed by the evaluation design and data collection methods. The clearer and more detailed these questions are, the more likely that you will be able to provide reliable and valid answers to them.</td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td>Describes the evaluation design and procedures. There are scores of designs and hundreds of procedures which can be used. The keys to success are matching these options to the purposes and questions of your client and keeping within the budget and timeline of the study.</td>
</tr>
<tr>
<td><strong>Sample</strong></td>
<td>Specifies which learners, instructors, and other personnel will participate in the evaluation. A rationale for sample sizes should be included.</td>
</tr>
<tr>
<td><strong>Instrumentation</strong></td>
<td>Describes all the evaluation instruments and tools to be used. Actual instruments should be included in appendices for review and approval.</td>
</tr>
<tr>
<td><strong>Limitations</strong></td>
<td>Spells out any limitations to the interpretation and generalizability of the evaluation. It should also describe potential threats to the reliability and validity of the evaluation design and instrumentation.</td>
</tr>
<tr>
<td><strong>Logistics</strong></td>
<td>Specifies who will be responsible for the various implementation, analysis, and reporting aspects of the evaluation.</td>
</tr>
<tr>
<td><strong>Timeline</strong></td>
<td>Presents the schedule for implementation, analysis, and reporting of the evaluation.</td>
</tr>
<tr>
<td><strong>Budget</strong></td>
<td>Clarifies the finances for the evaluation. Personnel time is usually the major cost factor. Other significant cost factors are travel, data preparation (e.g., transcribing taped interviews), and document duplication. Unfortunately, many evaluations lack sufficient funding.</td>
</tr>
</tbody>
</table>

**Figure 4.1.** Components of an evaluation plan.
Introduction
This section introduces the major sections of the plan as well as the primary people involved in writing it. Figure 4.2 provides an example of a typical “Introduction” section. It is a good idea to introduce the reader to the type and amount of information upon which you have based your evaluation planning, both in terms of human input and review of other materials.

![Figure 4.2. Introduction section for an evaluation plan.](image)

Evaluation Plan for “The Science of Amazon Exploration”
Draft of 11 August

Introduction
This document describes the background, purposes, limitations, audiences, decisions, questions, methods, sample, instrumentation, procedures, logistics, and timeline for the evaluation of the Science of Amazon Exploration (SAE) interactive multimedia CD-ROM currently being developed by the Imagination Corporation. The methodology, procedures, and instrumentation included in this plan are based on several meetings between members of the development team (Gwen Glass, Bobbi Burgess, and Lou Landers) and the evaluation team (Tom Reeves and John Hedberg), as well as a review of several draft design documents.

Background
This section (illustrated in Figure 4.3) describes any information that is needed to provide the reader with an understanding of the background of the interactive learning system being evaluated. The program or product being evaluated is called the “evaluand.” The reader should be given enough information to understand the unique nature of the evaluand, but not so much detail as to become bored. Explain any jargon used in describing the interactive learning system (e.g., e-learning) if the plan will be read by audiences unfamiliar with technical terms or the latest buzzwords. Although most evaluation plans are often rather dry reading, it does not have to be that way. Your evaluation plan can tell a story that is interesting, and you can include screen images from the evaluand. However, if lengthy background materials are needed, put them in an Appendix.

Purposes
This section (see Figure 4.4) thoroughly describes the purposes of the evaluation. An evaluation can address a variety of purposes, but all must be delineated clearly. Because evaluation is a political process, all parties must agree upon its purposes if it is to succeed. Sometimes the purposes stated in a plan will be related to one of the six major functions of evaluation described in Chapter Three, i.e., review, needs assessment, formative evaluation, effectiveness evaluation, impact evaluation, or
maintenance evaluation. More often, you will need to plan an evaluation that includes two or more of the major functions of the evaluation model proposed in this book. Given that the nature of the product or program being evaluated is sure to change over time, trying to anticipate all the evaluation functions in advance is difficult, and flexibility is required throughout the process.

Background

The interactive multimedia CD-ROM under development is called “The Science of Amazon Exploration” (SAE). (A second one planned is called “The Technology of Amazon Exploration” (TAE).) While it is obvious that the topic of this CD-ROM will have great appeal in schools and homes, the program is unique in its use of constructivist pedagogy. In traditional science and technology instruction, information is presented in encapsulated formats, often via abstract “teacher talk” and texts, and it largely is left up to the student to generate any possible connections between conditions (such as a problem) and actions (such as the use of knowledge as a tool to solve the problem). There is ample evidence that students who are quite adept at “regurgitating” memorized information on tests rarely retrieve that same information when confronted with novel conditions that warrant its application (Bransford, Sherwood, Hasselbring, Kinzer, & Williams, 1990). In a sense, most knowledge acquired through traditional instruction is “inert” except within the confined structure of traditional tests.

Interactive multimedia programs can be designed to present a focal event or problem situation that will serve as an “anchor” or focus for collaborative efforts among instructors and students to retrieve and construct knowledge (Brown, Collins, & Duguid, 1989; Cognition and Technology Group at Vanderbilt (CTGV), 1992). Perhaps the best known multimedia example of this approach is the “Jasper Problem Solving Series” developed by John Bransford, Susan Goldman, and their colleagues at the Cognition and Technology Group at Vanderbilt University (CTGV, 1992). Cognitive psychologists involved in the development of “Jasper” call this type of instruction “anchored instruction” (Bransford et al., 1990; CTGV, 1992) because the process of constructing new knowledge is situated or anchored in meaningful and relevant contexts. They maintain that events and problems presented in these types of programs should be designed to be intrinsically interesting, problem-oriented, and challenging. They have evidence that in response to these types of events and problems, students are more highly motivated and that they construct useful as opposed to inert knowledge (Bransford et al., 1990; CTGV, 1992).

The SAE and TAE CDs will provide precisely the types of problem situations that “anchored” interactive learning environments demand. In the “science” CD, the students will be confronted with realistic and challenging problems, e.g., a natural disaster such as a flood, and they must solve the problems that these disasters present for local inhabitants, explorers, fauna, and flora in the region. In the “technology” CD, students would confront the problem of mounting Amazon expeditions in different timeframes, e.g., the 20s, the 50s, now, and in the next century. Within each timeframe, they would have to adapt the technologies available at that time to mount a successful exploration of an unknown region of the Amazon. (For example, in the 50s expedition, they would not have the advantage of the satellite maps available as a result of the NASA programs of the 80s, but they would have improvements in malaria medicines over the medicine used by the 20s explorers because of the medical research done during the Second World War.)

Figure 4.3. Background to an evaluation plan.
Purpose
The overall purpose of this evaluation is to provide decision makers at the Imagination Corporation with the timely, accurate information required to support decisions regarding the enhancement, extension, and/or marketing of the SAE interactive multimedia CD-ROM. A list of anticipated decisions follows. As a result of this evaluation and the decisions and actions stemming from it, the SAE interactive multimedia CD-ROM should be ready for beta testing in selected markets within the fourth quarter of next year.

Specific sub-purposes of this evaluation are:

- to collect information for improving the SAE interactive multimedia CD-ROM from selected content and instructional experts;
- to collect information for improving the SAE interactive multimedia CD-ROM from members of the target audience (middle school students and teachers);
- to establish procedures for the customer beta test of the SAE interactive multimedia CD-ROM; and,
- to establish procedures for the ongoing collection of information for improving the SAE interactive multimedia CD-ROM after its customer beta test.

Figure 4.4. Purpose section of an evaluation plan.

Audiences
This section specifies all the primary and secondary audiences or consumers of the evaluation. Patton (1997) prefers the term “stakeholders” to designate audiences. In general, it is recommended to share information about an evaluation with as many people as the client will allow. Primary audiences include the people most directly involved in or affected by the evaluation, e.g., the target users of a product. Secondary audiences are any people judged to have a stake in the evaluation and thus a right to know about its methods and results (e.g., members of a state or district school board who review educational materials for certification purposes). As Patton (1997) noted “….stakeholders typically have diverse and often competing interests” (p. 42). Which audiences will receive evaluation reports is often a major focus for negotiation between you and your clients. Figure 4.5 provides a model description of audiences.

Figure 4.5. Audiences section of an evaluation plan.
Decisions
This section is the most difficult part of a plan to prepare, but it should be included if the evaluation is to have meaningful impact on decision making. (See Figure 4.6.) Trying to anticipate the decisions which can be influenced by an evaluation takes creativity and trust. Many clients do not wish to anticipate negative outcomes for their efforts, but these too must be considered. Obviously, you cannot create an exhaustive list of all the decisions that will be made about a program or product. Although we recognize that there will always be unanticipated decisions, we encourage you to identify decisions up front because if you don’t, your evaluation efforts are unlikely to be as influential as they could be.

Decisions
If this evaluation is to provide timely, accurate information to support decision making, we must anticipate decisions that will be made. It is important to remember that most of these decisions will be made regardless of the quantity and quality of information available to the decision makers. The following decisions are anticipated:

- Implementation procedures and delivery options for the SAE interactive multimedia CD-ROM will be established.
- Modifications will be made in the SAE interactive multimedia CD-ROM to improve its effectiveness and appeal.
- Other topics selected for interactive multimedia will be identified.
- Advertising and marketing decisions will be made about the SAE CD-ROM by the marketing and sales department of Imagination Corporation.

Figure 4.6. Decisions section of an evaluation plan.

Questions
A key element of a sound evaluation plan is careful specification of the questions to be addressed by the evaluation design and data collection methods. The clearer and more detailed these questions are, the more likely that you will be able to provide reliable and valid answers to them. Whenever decisions are made, questions are asked and alternatives are considered, formally and/or informally. In order to influence the decisions listed in your plan as well as other unanticipated decisions, your evaluation must provide answers to a variety of questions that enable “informed” decision making. Figure 4.7 provides one example.

Another challenge in evaluation planning is limiting the questions to those that are the most relevant to the decisions that must be made without exceeding the amount of time, money, and other resources that are allocated for evaluation. It most cases, there will be far more questions that could be asked than your resources will allow, and therefore
some difficult choices must be made about which questions will actually be addressed. You are advised to make these choices in collaboration with your clients and other primary audiences in advance of any data collection for the evaluation.

**Questions**

The following questions will be addressed during this formative evaluation:

a. What are the logistical requirements for implementing the SAE interactive multimedia CD-ROM?
   - hardware
   - software
   - adjunct materials
   - help and support

b. What are user reactions to the SAE CD-ROM?
   - appeal
   - motivation
   - usability
   - comprehension

c. What are teacher reactions to the SAE CD-ROM?
   - appeal
   - utility

d. What are expert reactions to the SAE CD-ROM?
   - content
   - instructional design
   - human-computer interface
   - aesthetics

e. What corrections must be made to the SAE CD-ROM?

f. What enhancements can be made to the SAE CD-ROM?

**Figure 4.7.** Questions section of an evaluation plan.

**Methods**

The “Methods” section (illustrated in Figure 4.8) describes the overall evaluation design and data collection strategies to be employed in your evaluation. There are scores of designs and many more data collection strategies that can be used. The keys to successful evaluation are matching these options to the purposes and questions of your client while keeping within the budget and timeline of the study. Unfortunately, traditional evaluation textbooks do not provide sufficient practical guidance in the area of methodology because the examples they include are usually based upon the assumption that one design will suffice (e.g., a quasi-experimental design comparing an instructional innovation with a “traditional” one). Experienced evaluators can attest that most evaluations demand multiple designs and multiple methods (cf., Baker, Herman, & Gearhart, 1996; Mark & Shotland, 1987).
One of the reasons that you will probably want to include multiple methods in your evaluation is the need to “triangulate” your findings. You can triangulate findings by using more than one method to collect data about an issue in the evaluation. For example, suppose you are interested in student attitudes toward the use of a new instructional CD-ROM in a course. A general questionnaire designed to elicit their opinions of the CD-ROM would be one way of collecting that data, but students are often turned off by questionnaires, and they may provide you with little detailed information about their real reactions to the product. A better strategy would be:

1) begin your data collection by interviewing a few selected students about their reactions to the CD-ROM;

2) design a questionnaire based upon the interview data and distribute it to a larger group of students; and

3) follow-up the questionnaire with a focus group of students to elaborate or clarify the results of the questionnaire.

Methods

No single evaluation design can encompass the six major questions specified for the evaluation of the SAE interactive multimedia CD-ROM. Therefore, a variety of evaluation designs and methods will be utilized to collect the information required to address these questions. The data collection methods include:

- anecdotal records
- user questionnaires
- user interviews
- user focus groups
- usability observations
- online data collection
- expert review

**Figure 4.8.** Methods section of an evaluation plan.

A good way to succinctly present how your evaluation methods align with your questions is to use a matrix. Figure 4.9 is a matrix that illustrates the relationship between specific questions and the data collection methods used in an evaluation. On one axis of the matrix you list the questions that are to be addressed by your evaluation. On the other axis of the matrix you list all the data collection methods that are reliable, valid, and feasible for this particular evaluation. (The example in Figure 4.9 is by no means an exhaustive list of all the evaluation data collection methods that could be employed in an evaluation. Other chapters in this book provide examples of additional methods.) An advantage of using a matrix is that you, your colleagues, and your clients can review the articulation or alignment among the evaluation questions and proposed methods of collecting data to address these questions.
The matrix not only provides an overview of the evaluation methods. It also allows you to ensure that each question is addressed by one or more data collection methods. Although it is not always in every evaluation, it is desirable to triangulate most questions with more than one evaluation method. (Examples of the instruments used with each method are usually placed in appendices to the plan.)

<table>
<thead>
<tr>
<th>METHODS</th>
<th>a. What are the logistical requirements?</th>
<th>b. What are user reactions?</th>
<th>c. What are teacher reactions?</th>
<th>d. What are expert reactions?</th>
<th>e. What corrections must be made?</th>
<th>f. What enhancements can be made?</th>
</tr>
</thead>
<tbody>
<tr>
<td>anecdotal records</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
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<td>X</td>
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<td>user questionnaires</td>
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<td>X</td>
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<td>user interviews</td>
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<td>expert reviews</td>
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<td>X</td>
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</tbody>
</table>

**Figure 4.9.** Data collection matrix of an evaluation plan.

**Sample**

This section specifies exactly which learners, instructors, experts, and other personnel will participate in the evaluation. If necessary, a rationale for sample sizes should be included as well. Involving people in an evaluation should not be done carelessly because you are asking for their valuable time and energy.

The nature of your sampling strategies will vary considerably depending upon the purpose of your evaluation and the status of the program or product being evaluated. For example, early in the stages of development of a new interactive learning system, you will usually use fewer participants for longer and more intensive evaluation sessions. On the other hand, a Web-based product that is ready for beta testing can be shared with large numbers of reviewers around the world who might try it out and complete a brief survey about it after the trial period (Perkins, 2001). Figure 4.10 illustrates the “Sample” section for an evaluation plan.
Sample

The participants in this evaluation will be:
• a panel of content and instructional experts who are yet-to-be-identified;
• 10 teachers and 30 student volunteers from a local middle school; and
• 8 representatives from the Imagination sales and marketing department.

Figure 4.10. Sample section of an evaluation plan.

Instrumentation

This section (Figure 4.11) describes the instruments to be used in the evaluation. Copies of instruments should be included in appendices for review by your clients or others. The descriptions in this section should provide enough information to permit readers to judge the various purposes and uses of different instruments. Some evaluations of interactive learning systems will require the development of new instruments, in which case the plan may only include an outline of how the instruments will be developed.

Whatever types of instruments you use, you’ll need to be concerned with issues of reliability and validity. The reliability and validity of instruments must be considered in light of the purposes of the evaluation (Patton, 1997). Reliability deals with the consistency of measurement or data collection. For example, a bathroom scale that provides the same weight if you step on it ten times in a row is probably reliable. Validity is about the degree to which an instrument achieves its aims. For example, if you want an accurate report of your weight, your reliable bathroom scale will need to be calibrated with another scale of recognized accuracy. It could be giving you the same weight ten times in a row, but be off by five pounds! Although any evaluator should know the fundamentals of establishing the reliability and validity of evaluation instruments, it may be necessary to hire measurement specialists to provide expert consultation in this area, especially when new instrumentation is being developed.

Limitations

This section spells out any limitations to the interpretation and generalizability of the evaluation. Frankly, we have found that most people put too much faith in the findings of evaluations, perhaps assuming that if they read a report in print, it must be true. Every evaluation has limitations and/or room for alternative explanations. The limitations section of your plan should describe potential threats to the reliability and validity of the evaluation design and instrumentation. Figure 4.12 provides an example.
Instrumentation

Appendix A includes a sample Anecdotal Record Form which all developers involved in the creation of the SAE interactive multimedia CD-ROM will complete. This instrument requires a description of any incident determined to be important to the project and a separate interpretation of the event. A model of a completed Anecdotal Record Form is also included in Appendix A. Anyone who observes an incident or has an experience which should be reported for this evaluation should complete an Anecdotal Record Form as soon as possible after the incident or experience so that an accurate record and interpretation can be made.

Appendix B includes a sample User Questionnaire that the students and teachers participating in this evaluation will complete after they try the prototype SAE CD-ROM for at least one hour.

Appendix C includes a protocol for the User Interviews that will be conducted with selected students and teachers who have used the prototype SAE CD-ROM for at least one hour.

Appendix D includes a protocol for a User Focus Group that will be conducted with selected students and teachers who have used the prototype SAE CD-ROM for at least four hours.

Appendix E includes a description of the protocols to be followed when using the portable usability lab to record student and teacher interactions with the prototype SAE CD-ROM.

Appendix F includes a list of all the data to be collected by the computer while users are trying the prototype SAE CD-ROM. This data includes both navigation paths and response choices.

Appendix G includes brief resumes of fifteen interactive multimedia experts from whom a panel of three will be selected to review the prototype product. A list of scientists and geographers who may be requested to review the content of the SAE and TAE CD-ROM is also included.

Figure 4.11. Instrumentation section of an evaluation plan.

Limitations

Two constraints on this evaluation should be clarified. First, all contents of the CD-ROM must be regarded as changeable during the formative evaluation phase, and indeed they are expected to be modified in response to expert and user reactions. The “moving target” nature of the SAE interactive multimedia CD-ROM should be viewed as an advantage in that its flexibility increases the likelihood that the information yielded by the formative evaluation will be used to make substantive improvements in the structure and operation of the program. The second constraint has to do with the different perspectives of the participants in this evaluation. The sales and marketing participants are concerned primarily with selling this program, while the end user participants will be concerned primarily with its appeal, effectiveness, and value. These distinctive perspectives must be kept in mind whenever the results of the evaluation are considered. Failing to consider the seller vs. user perspective could result in misinterpretation of the findings.

Figure 4.12. Limitations section of an evaluation plan.
Logistics

This section (Figure 4.13) spells out who will be responsible for the various implementation, analysis, and reporting aspects of the evaluation. There are a variety of computer programs and tools that can assist in your efforts to keep an evaluation on schedule and within a budget. (Microsoft Project 2000 is an example of project management software.) Much of the data you collect in an evaluation is time-sensitive. For example, the responses that you get from a student immediately after trying a new product will be different from the responses you get after a delay of only a few hours. Sometimes, you will want to delay data collection, but most often you will want to collect evaluation data while someone actually uses a new program or product, or as soon as possible thereafter.

Logistics

Tom Reeves and John Hedberg will coordinate the implementation of this evaluation plan, including scheduling, data collection, and data transmission, with the course development staff, primarily Gwen Glass, who is the course manager for this project. All data will be processed, analyzed, interpreted, and reported by Tom Reeves and John Hedberg. All reports will be provided to managers and members of the development team at the Imagination Corporation. Further dissemination of the evaluation findings will be determined by the managers. Additional details about the logistics are found in the timeline section of this plan including due dates for deliverables.

Figure 4.13. Logistics section of an evaluation plan.

Timeline

This section presents the schedule for implementation, analysis, and reporting of the evaluation (see Figure 4.14). Project management software is helpful in preparing a timeline for evaluations, although these programs can be expensive and somewhat complex to use. However, if you conduct many evaluations, developing expertise with project management software is a good investment of your money and time.

Timeline

This evaluation plan has been revised based on an earlier draft prepared in July. The final evaluation plan will be reviewed, revised, and approved by August 14. The initial data collection phase of the evaluation itself will commence August 28 at Lincoln Middle School. The first interim report will be delivered by September 15. The final report of this alpha test of the product will be submitted by September 29.

The beta test phase of the evaluation will occur in October, with the intent of a final report being delivered by October 27. Additional interim reports will be produced as requested. The final release of this product must occur in time for this year’s Christmas buying season.

Figure 4.14. Timeline section of an evaluation plan.
Budget
This section “costs out” the finances for the evaluation. Evaluation is very much a people-intensive process. In fact, most of the money spent on evaluation usually will be for personnel and consultant costs. If specialized equipment and facilities such as a software usability laboratory are used, additional costs will be incurred. Budgeting for evaluation is always a challenge because most project managers are somewhat reluctant to spend money for evaluation in the first place. When things get tight during a development project, they often look at cutting the evaluation budget first. A simple sample budget appears in Figure 4.15.

We are sometimes asked to recommend a percentage of a product development budget to be devoted to evaluation. This is difficult to do without the details of any given project, but a general estimate of ten to twenty percent of the development budget should be devoted to evaluation activities, ranging from review through effectiveness evaluation. Impact and maintenance evaluations will require additional allocations.

<table>
<thead>
<tr>
<th>Item</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reeves’ consulting</td>
<td>4 days @ 1,200</td>
<td>4,800</td>
</tr>
<tr>
<td>Hedberg’s consulting</td>
<td>5 days @ 1,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Expert review honorariums</td>
<td></td>
<td>3,000</td>
</tr>
<tr>
<td>Usability lab rental</td>
<td>2 days @ 1000</td>
<td>2,000</td>
</tr>
<tr>
<td>Travel &amp; per diem</td>
<td>2 trips at $750</td>
<td>1,500</td>
</tr>
<tr>
<td>Materials, printing, copying</td>
<td></td>
<td>500</td>
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<tr>
<td>Donation to participating school</td>
<td></td>
<td>2,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>18,800</td>
</tr>
</tbody>
</table>

Figure 4.15. Budget section of an evaluation plan.

Managing the evaluation process

Managing evaluations is just as important as planning them. There are several time-tested strategies that can help you meet the management challenge. These include evaluation diaries, status reports, and sign-off forms.

Evaluation diary
An evaluation diary is a collection of the documents that can be used to keep track of the planning, implementing, analyzing, and reporting aspects of an evaluation. A diary is an excellent management tool,
especially for large-scale evaluations. What should be kept in an evaluation diary? Figure 4.16 is a list of 10 typical components of an evaluation diary.

You will need to take special security measures with data collected and stored in an evaluation diary, especially in situations when confidentiality is a major issue. Generally, the evaluation diary is not made available to your clients or other members of a development or implementation team. It is a management tool for you and others who are involved directly in the evaluation effort rather than a type of evaluation report.

There are certainly other types of documentation that can be maintained in an evaluation diary or log. The important thing is to begin maintaining careful records from the very beginning of the evaluation. It is extremely difficult and in some case impossible to document your evaluation efforts later in the process. In the age of the “paper-less office,” all the documentation for an evaluation can be maintained online. However, in light of computer thefts, crashes, and other mischief, we recommend keeping a hard copy backup of all your evaluation documents. These can be organized into three-ring binders or a set of file folders.

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation Plan</td>
<td>A copy of the most current plan plus various revisions that it went through during negotiations with clients.</td>
</tr>
<tr>
<td>Status Reports</td>
<td>Copies of the periodic evaluation status reports (weekly are recommended) provided to clients.</td>
</tr>
<tr>
<td>Correspondence</td>
<td>Copies of memos, letters, sign-off forms, and even copies of e-mail if deemed relevant.</td>
</tr>
<tr>
<td>Financial Records</td>
<td>Detailed financial records, including printouts of budgeting spreadsheets, receipts, invoices, etc.</td>
</tr>
<tr>
<td>Instrumentation</td>
<td>Copies of evaluation instruments that were obtained, developed, and/or revised for the evaluation.</td>
</tr>
<tr>
<td>Data</td>
<td>Backup copies of all the data (raw and processed) collected during the evaluation.</td>
</tr>
<tr>
<td>Analyses</td>
<td>Printouts of the analyses run on the data, both quantitative and qualitative.</td>
</tr>
<tr>
<td>Reports</td>
<td>Copies of all the interim and final reports generated during the evaluation.</td>
</tr>
<tr>
<td>Timeline</td>
<td>Timeline and documentation for any changes that may have been made in the schedule.</td>
</tr>
<tr>
<td>Notes</td>
<td>Copies of your personal notes from evaluation meetings, observations, etc.</td>
</tr>
</tbody>
</table>

*Figure 4.16. Typical components of an evaluation diary.*
Status reports

Evaluation status reports are brief reports distributed to evaluation team members, your clients, and sometimes to selected primary or secondary audiences for the evaluation. Figure 4.17 presents an example of an evaluation status report.

Status reports serve two essential purposes: first, updating everyone about the current status of the evaluation, and second, documenting controversial decisions and other important events. How often status reports are issued depends upon the schedule and intensity of an evaluation effort. In larger-scale evaluations, they are often prepared on a weekly basis, whereas on longer-term or smaller-scale evaluations, less frequent reports may suffice. Generally, it is better to err on the side of keeping your clients and other stakeholders over-informed about the status of the evaluation effort than to leave them under-informed.

<table>
<thead>
<tr>
<th>Evaluation Status Report: Science of Amazon Exploration CD-ROM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: September 12                                           From: John Hedberg</td>
</tr>
<tr>
<td>Accomplishments: (Since August 28)</td>
</tr>
<tr>
<td>• Began the CD-ROM evaluation at Lincoln Middle School on schedule.</td>
</tr>
<tr>
<td>• 21 students and 4 teachers have completed questionnaires and interviews.</td>
</tr>
<tr>
<td>• Focus group is scheduled for Friday, September 15, in the school auditorium.</td>
</tr>
<tr>
<td>Pending Items:</td>
</tr>
<tr>
<td>• Complete reviews with the other students and teachers.</td>
</tr>
<tr>
<td>• Analyze questionnaire and interview data.</td>
</tr>
<tr>
<td>• Prepare draft final report due September 29.</td>
</tr>
<tr>
<td>Concerns and Recommended Actions:</td>
</tr>
<tr>
<td>• It is proving more difficult to get teachers to review the CD-ROM than expected. We may not have 10 teachers in the final sample, but we will try. The teachers' schedules are very tight. We are trying for at least five teachers.</td>
</tr>
<tr>
<td>• There are major problems in the CD-ROM if certain options are selected. When students try to create their own multimedia reports, the whole system crashes. These bugs must be fixed before further user testing is undertaken. A timeline for fixing these bugs must be established.</td>
</tr>
<tr>
<td>Remarks:</td>
</tr>
<tr>
<td>• The programmers from the development team are working hard to fix the bugs in the CD-ROM, but they are also having trouble with the authoring software. The problems may be beyond their control. What contingency plans do we have?</td>
</tr>
</tbody>
</table>

Figure 4.17. Sample evaluation status report.
Sign-off forms

A sign-off form is an invaluable tool for managing the evaluation of interactive learning systems. The sign-off form documents client approval of an evaluation plan, interim report, final report, or any other document considered important within the context of the evaluative effort. For example, most evaluators prepare draft reports at regular intervals. Draft reports should be reviewed carefully by your clients, and their review process should be documented. The sign-off form indicates the client’s approval to proceed with the next step of the evaluation and to pay for work completed, if applicable. Figure 4.18 presents a sample sign-off form.

A sign-off form is a powerful instrument that will help you keep your evaluation effort moving and prevent the client from constantly rethinking the evaluation. Of course, sometimes the client will have good reasons for wanting to change the questions addressed or methods used in an evaluation. If you have carefully documented previous negotiations, you will be in a stronger position to request the additional finances, time, or personnel that may be required to fulfill the new requests.

![Sign-Off Form](image)

Figure 4.18. Sample sign-off form.

Documenting the design and implementation processes

We have not included documentation on our list of the major functions for evaluating interactive learning systems (as outlined in Chapter Three) for several reasons. First, the activities, procedures, and tools of documentation as an evaluation function often overlap with the work of the Management Information System (MIS) personnel within a particular...
agency or group. Second, regardless of who does it, documentation is not a function that occurs within the context of one particular phase of the instructional design process, but instead cuts across all the major phases involved in the design and implementation of interactive learning systems. Third, the data derived from a comprehensive project documentation system can often be reused within the context of other evaluation functions, and thus planning and establishing documentation activities is often a precursor to other functions.

Why should you document your development and evaluation activities?

One purpose of documentation is to account for resources expended during the development and implementation of interactive learning systems. Information about how resources have been used and when various tasks have been completed is essential in making better decisions. As illustrated in Figure 4.19, you, your project manager, and other people involved in a project will often be called upon to make critical decisions about an interactive learning system as it is being developed or implemented. Each decision can be based upon habits, ignorance, or preferably, the type of information provided by good documentation. Whether data is provided by an in-house MIS or a special set of documentation activities followed by your team, decision making should be informed by data.

<table>
<thead>
<tr>
<th>Decision</th>
<th>The development project may take longer than planned. Should I ask for more time?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Politics</td>
<td>The team leaders tell me we’ll never finish on time, and the team members seem stressed out. I’d better ask the clients for more time so the team members don’t quit!</td>
</tr>
<tr>
<td>Ignorance</td>
<td>I don’t have a clue where we are with the schedule, but the clients will be upset if I ask for more time. I’d better ask the team members to do more!</td>
</tr>
<tr>
<td>Documentation</td>
<td>The PERT chart indicates that we have slipped behind a day in our timeline, but we have some slack days built into next week’s programming schedule. We’ll catch up then.</td>
</tr>
</tbody>
</table>

**Figure 4.19.** A decision and three approaches to making it.

Documentation is an essential component of any systematic effort to develop interactive learning systems. As noted above, documentation is analogous to a management information system (MIS) in a business. Just as a well-designed MIS provides managers with up-to-date information about sales, profits, losses, schedules, inventory, and other factors needed to make timely business decisions, a well-designed and carefully
implemented documentation system can provide team members with the information they need to make decisions involved in managing instructional design and implementation projects.

In fact, the similarity between a good MIS and good documentation may be so strong that you might assume that the latter effort is unnecessary. This sounds good in theory, but it is weak in reality. Many companies lack a strong MIS, and so there is often no other source of the type of information provided by documentation activities. Further, even when a MIS exists, it may not be focused on the typical data needed by managers of interactive learning systems. A corporate MIS may focus on profits, inventory tracking, and personnel issues, whereas the instructional design or implementation project manager may require detailed information about expenditures and schedules. Of course, if a good MIS is available, you should tap it for as much information as you can and avoid duplicating any data collection.

What kinds of decisions can you anticipate?

Suppose one of the instructional designers on a development team asks for a raise. The project manager wants to know if this person has done more than his share of the work as claimed. Checking your documentation records (e.g., the “Development Activity Logs” illustrated in Figure 4.20), you discover that this person is consistently putting in 15-20 more hours per week than anyone else, and you report this to the manager. Of course, the manager doesn’t automatically make a decision about the pay raise based upon this information alone. The manager must balance the overtime data with her opinion of the quality of this person’s design work, but the data you provided does give her an important piece of information needed to make the decision. That’s what documentation is all about!

There are many other practical examples of the need for documentation. For instance, as a developer of an interactive learning system, you can expect that the project will lag behind schedule from time to time. You may also experience budget cuts, and you might even have team members who change jobs in the middle of your project. Each of these and numerous other problems that occur on an almost daily basis will require you to make decisions. Should you modify the scope of the product to save time and money? Should you hire more staff or motivate existing team members to be more productive? Should you request a budget increase or a project extension? There will be no shortage of decisions that can be informed by better documentation data!
What questions should be answered before making decisions?

A key to effective documentation is anticipating the questions that managers, clients, team members, or others may ask about the project before making decisions. Some are obvious whereas others are subtle. For example, a manager might ask questions about the morale of a development team. Designing interactive learning systems is essentially a creative process, and people involved in creative work are prone to argue from time to time about the quality and quantity of the work being accomplished. Although tracking the morale of a development team is challenging, it may be something you’ll be asked to do.

Fortunately, most of the documentation questions asked by project managers and team members are about issues more concrete than team morale. For example, before making decisions about project resources, people need reliable answers to questions about the schedule, the budget, and other types of resources. Typical questions include: What is the current state of the development schedule? Who has accomplished what tasks? What is the status of the budget? Is there any lag time in the schedule? Making decisions without accurate answers to these and other questions may force you and others to base decisions upon less-reliable foundations such as intuition, habit, rumor, or guesswork.
What kinds of information do you need to answer questions?

The tasks involved in developing interactive learning systems range from project conception and proposal writing to marketing and implementation. Each of these tasks requires some expenditure of resources, whether they be human, temporal, and/or financial resources. Unless you work in Hollywood, there will probably be major limitations on your resources in each of these categories, and it behooves you to have current information about their status. At a minimum, documentation activities should provide you with reliable, valid information within each of these three categories, i.e., people, time, and finances.

What do you need to know about people? You need to know what their jobs are, especially in terms of responsibility and authority for different tasks within a project. You need to know what they have done and what they still have to do. You may even want to know their attitudes toward the project, themselves, their colleagues, and so forth. Is their job satisfaction high or are they looking for another position? You would not want project success to hinge on just one person who simply might not show up tomorrow.

What do you need to know about time? You need to know how much time has been allocated for each phase of a project. You need to know if those tasks that must be accomplished synchronously are being done according to schedule. You need to know where there is slack time in the schedule so that extra time can be put in when other deadlines are missed. In today’s fast-paced world of e-learning development, completing a project on schedule is sometimes much more important than keeping within a specific budget (Rosenberg, 2000).

What do you need to know about finances? You need to know the state of the budget, including, in many institutional settings, the amount of money allocated to “overhead.” You need to know what has been spent and what costs still loom ahead. You will want to know how the costs of various items or services are changing during the lifetime of a project.

In addition to information about people, time, and money, you may want to collect evidence that can be used to tell the “story” of your project. What really happened? How has it affected the people involved in it? What were the high and low points of the project? While at first glance telling the story of your project may seem frivolous, it could prove to be invaluable, especially with respect to creating what Senge (1990) calls a “learning organization” in your company or institution. The bottom line is that documenting today’s successes and failures can help you improve your next project.
A key element of sound documentation is integrating data collection and reporting into the work habits of all team members. A useful instrument for this is a “development activity log.” Figure 4.20 presents the critical elements of this log. If each team member accurately records his/her time spent on each of the various tasks involved in the development of an interactive learning system, you will possess the basic information required to know the current status of the project, and you will be able to estimate possible problems, such as schedule delays or budget shortfalls.

**DEVELOPMENT ACTIVITY LOG**

<table>
<thead>
<tr>
<th>Date</th>
<th>Hours</th>
<th>Project Code</th>
<th>Activity Code</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/17</td>
<td>4</td>
<td>A27</td>
<td>1.1</td>
<td>Met with seven science teachers at Jackson School to assess needs.</td>
</tr>
<tr>
<td>1/17</td>
<td>6</td>
<td>A24</td>
<td>2.7</td>
<td>Conducted usability tests of the environmental prototype.</td>
</tr>
<tr>
<td>1/18</td>
<td>8</td>
<td>A27</td>
<td>1.2</td>
<td>Wrote audience assessment for school science project.</td>
</tr>
</tbody>
</table>

**Figure 4.20.** Sample development activity log instrument.

Ideally, the development activity log should be computer-based so that team members can easily log in their accomplishments on an hourly or daily basis. Paper-based systems can also be used, provided you have
clerical resources to enter the data into a spreadsheet or statistical package for timely analysis and reporting.

The primary problem you are likely to experience in making a development activity log part of your documentation evaluation is a human one. Many people are inexperienced with the process of documenting their work. Others lack the commitment to maintain accurate records of what they have accomplished. You, in collaboration with the project managers, will need to motivate their active participation in the documentation process through a variety of means. Of course, there is a precedent for logs in many work places, i.e., time cards, but these usually only entail recording “in” and “out” times. Training will probably be required to help team members perceive the value of a more elaborate documentation log. But it is worth doing! Not only does it provide you with timely, accurate information about the current state of the project, it also yields invaluable information the next time you prepare a proposal or budget for a similar project. How much it costs to develop interactive learning systems has never been stated definitively. Per hour development cost estimates range from as low as $5,000 per hour of instruction to as high as $50,000. If more development teams maintained accurate and complete development activity logs, we would have a much better understanding of what it costs to produce interactive multimedia learning environments.

The “Development Activity Log” illustrated in Figure 4.20 is only an example. Your particular project will probably entail a different set of activities, depending on whether it is focused on development, implementation, or both. Your logging system should contain the level of detail regarding activities that will be useful to you, your project manager, and other team members. Do not collect more data than you can actually use. Columns in the log can be used to record dates, time spent, project codes, activity codes, and other helpful explanation. (If your team members are working on only one project, the column for recording project codes can be eliminated.) Ideally, this type of instrument would be provided to your team members as an electronic tool coordinated with an electronic appointment calendar accessible via desktop computers, laptops, personal digital assistants, and digital phones. Some Web sites include a shared calendar function that can fulfill this role for the project team.

Similar to the Evaluation Diary described earlier in this chapter (see Figure 4.16), another useful tool for documentation evaluation is a “project diary” (Greer, 1991, 1992, 1996, 1997). A project diary can be kept as an electronic resource using word-processing, spreadsheet, and database programs or it can be simply maintained in a three-ring binder.

Recommended components of a project diary are:
- multimedia development project proposal
- contracts and subcontracts
- schedules such as PERT charts or timelines
- budget reports and invoices, receipts, and payment records
- project status reports
- sign-off forms
- anecdotal records

Project status reports are brief reports for clients as well as project team members and management that update everyone about the current project status and document controversial decisions and other important events. Project status reports are similar to evaluation status reports (see Figure 4.17 in this chapter) except the former are focused on the project as a whole and the latter are focused on the evaluation effort. Figure 4.21 presents an abbreviated project status report for a typical project.

---WEB LINK---
For more information about project diaries and other project management tools, an excellent resource is Michael Greer’s Project Management Resources site at: http://www.michaelgreer.com/

---Figure 4.21--- Sample project status report.

For every deliverable, include a sign-off form (see Figure 4.18) for your client to formally acknowledge receipt and approval of the deliverable. As described above, a sign-off form documents client approval of a given project milestone, e.g., a draft script or a video sequence. Developing an interactive learning system is analogous to an engineering project in that it yields tangible draft programs at regular intervals that should be reviewed by clients. The sign-off form indicates the client’s approval to
proceed with the next step of the development cycle and to pay for the completion of this step, if applicable.

Despite the best planning possible, disagreements about design features are inevitable within any significant instructional development project. Documenting client reviews and having carefully recorded sign-offs can be the single most important tool in your documentation toolbox. Our experience is that some development projects get mired in controversy and even legal wrangles when such agreements are not carefully documented.

As noted earlier in this chapter, documentation is not just a matter of compiling facts and figures. If feasible, you should also consider telling the human side of any development project. Development projects have highs and lows, and there are important lessons to be learned all along the way. One way of telling the story of a project is to keep a narrative journal of what happens during the course of a development or implementation project. Keeping such a journal or log is not easy, especially if you don’t have time during the day to record the major events, but it is a professional habit that we recommend highly. Some people find it easier to record the story of a project using a small hand-held recorder. Clerical personnel can transcribe the tapes for later reference. You might even recruit an intern from a university or college design program to document “the making of” your interactive product with digital pictures, interviews, and a web site that can be shared with other members of the project team and beyond.

An anecdotal record form (see Figure 4.22) can also be a useful instrument for recording the human “stories” that are integral to a large-scale, creative development project. An important aspect to note about the anecdotal record form instrument is that it requires you to distinguish carefully between what you observed and your interpretation of that observation. You should try to be as descriptive as possible in the first part of the anecdotal record form without rendering explicit judgments about the meaning of what was observed. This will allow others to make their own interpretation of the meaning of the anecdote before reading your interpretation.

In our experience, this type of instrument is particularly useful when your interactive learning system has been disseminated to different sites, and you want to get the local site managers to provide you with information about how the system is working under realistic conditions. The stories that come in from the field can be among the most enlightening forms of evaluation data you will collect. Anecdotal records collected during a pilot evaluation might reveal that an otherwise innovative and effective e-learning program that the central office training manager was promoting was being underutilized in the field because the Web browser
plug-ins it required conflicted with the locked-down desktop that had been established by the managers of the information technology infrastructure at each site. (If this scenario sounds familiar, it is because it is more common than you think!)

<table>
<thead>
<tr>
<th>ANECDOTAL RECORD FORM</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE: July 23</td>
</tr>
<tr>
<td>PLACE: Production Site 3</td>
</tr>
<tr>
<td>PROJECT: Home Safety CD-ROM</td>
</tr>
<tr>
<td>NAME OF OBSERVER: Lucy Schweitzer</td>
</tr>
</tbody>
</table>

Description of the incident: The fire scenes for the “Home Fire Safety” module were shot today. During lunch, I sat with the fire marshal who is serving as the content expert during the video production. He told me several horrible stories about recent home fires in this city where many lives had been lost despite the presence of smoke detectors in the homes that were burnt. It turns out that the fire department’s research indicates that 43% of the homes with fire and smoke detectors have dead batteries or other malfunctions. He said thousands of people go to sleep in this city every night thinking they are protected when they are not.

Interpretation: The fire marshal’s stories horrified and shocked me. (I certainly plan to check my smoke detectors tonight!) It might help motivate our team on this project to have the fire marshal speak to the whole team at the next project meeting.

Figure 4.22. Sample anecdotal record form.

Yet another source of tools for project documentation are sophisticated project management software packages such as Microsoft Project. These programs integrate various project planning and tracking tools (e.g., PERT and GANTT charts) with resource analysis features and timelines. Our experience shows that an initial investment in learning how to use these complex programs can pay-off in the long run as you endeavor to document the ups-and-downs of a major development project or a large scale implementation effort.

Summary

This chapter has introduced you to the process of planning and managing evaluations of interactive learning systems. Obviously, you can’t be expected to become expert in these processes instantly. Substantial experience is required to refine your knowledge and skills in these areas. Much of the expertise required for planning and managing evaluations involves negotiation skills. It is beyond the scope of this book to provide you with an introduction to the art of negotiation, but most libraries and bookstores contain numerous volumes on the process of negotiating. It might be worth your while to read one or two of these books or perhaps even attend a workshop on negotiating skills when one is provided in
your area. Evaluation inevitably involves clashes of values and goals. Negotiation skills are essential for successful evaluators.

This chapter has also introduced some rudimentary procedures and tools for setting up a documentation system for your development or implementation project. Any information you collect for documentation purposes is also likely to be useful in fulfilling some of the other functions of evaluations. The next chapter is focused on “Review,” the first of the six major functions we have identified in our model.

References


