



OERL

: Online Evaluation Resource Library

contact
discussion

Geoscience Projects and The Online Evaluation Resource Library (OERL)

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Funded by the Research, Evaluation, and Communication (REC) Division of the
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A Web-Based Tool to Support the Professional Development of Evaluators

The collection

Reviewed evaluation materials (plans, instruments, reports) organized by subject, project area, project organization

Contributor information

Indexed components of evaluation materials

Supporting materials

Criteria, Glossary, Standards

Professional development modules and tools



Reviewed collection of plans, instruments, and reports, complete or excerpted

Search for Reports

Specify the features you're looking for below.

To choose multiple selections in the boxes below, press the *Ctrl* (Windows) or *Command* (Macintosh) key and click on the item. Use the same key to remove a choice that has already been selected.

For these Types of Reports:

Choose Everything:

- Complete Reports
- Report Excerpts

With these Components:

Choose Everything:

Analysis Process:

Choose All

- Qualitative Analysis
- Quantitative Analysis

Design:

Choose All

- Data Collection Procedures & Schedule
- Information Sources & Sampling
- Instruments
- Meta-Evaluation

Evaluation Overview:

Choose All

- Evaluation Purposes
- Evaluation Questions
- Evaluator Credibility
- Stakeholder Involvement

Project Description:

Choose All

- Project Context
- Project Features
- Project Participants, Audiences & Other Stakeholders

Results & Recommendations:

Choose All

- Interpretations & Conclusions
- Recommendations
- Stakeholder Review & Utilization

Executive Summary



Reviewed collection of plans, instruments, and reports, complete or excerpted

From these Types of Projects:

Choose Everything:

- Curriculum Development
- Faculty Development
- Teacher Education
- Technology
- Under-Represented Populations

From Projects funded by:

Choose Everything:

- NSF Division of Elementary, Secondary, and Informal Education (ESIE)
- NSF Division of Human Resource Development (HRD)
- NSF Division of Research, Evaluation & Communication (REC)
- NSF Division of Undergraduate Education (DUE)
- U.S. Department of Education Technology Innovation Challenge Grants
- Unidentified

From Projects in these Content Areas:

Choose Everything:

mathematics:

Choose All:

- algebra
- calculus
- general mathematics
- statistics

unidentified

science:

Choose All:

- astronomy
- biology
- chemistry
- computer science

social science:

Choose All:

- culture
- economics
- geography

technology:

Choose All:

- general technology

From Projects contributed by these Organizations:

Choose Everything:

- Algebra Project, Inc.
- American Institute of Physics
- Anonymous
- Arizona State University
- Auburn University



Reviewed collection of plans, instruments, and reports, complete or excerpted

Results of Search for Reports

You searched for Complete Reports and Report Excerpts ...

- with any component
- from Projects:
 - of any type
 - contributed by any organization
 - funded by any source
 - in content areas:
 - environmental science
 - geology
 - physical sciences
 - physics

Start a [new search](#) for Reports or [modify this search](#).

There are **14** items in this result set.

[Curriculum Development](#) (5)

[Faculty Development](#) (2)

[Teacher Education](#) (7)

Curriculum Development

Report Excerpts

- [View this Excerpt](#)

Description: Describes project goals and components; Specifies comparison groups
from

Project: Establishment of Extended General Physics - An Alternative Course for Underprepared Students

Organization: Rutgers University, New Brunswick

Content Area: physics (science)

[View Project Contact Information](#)

Submission Process

NSF solicits from targeted project areas

SRI reviews and catalogs

Current and pending solicitations:

- Advanced Technology Education
- Course, Curriculum, and Laboratory Improvement
- Programs for Gender Equity



Current Representation of Geoscience Projects in OERL

	PROJECT AREAS			
	Curriculum Development	Teacher Education	Faculty Development	Under-Represented Populations
Complete Plans	1	1		1
Plan Excerpts	4			
Instruments	3	3	11	4
Complete Reports			1	
Report Excerpts	5	7	1	

Plan Excerpts – Integrated Math-Physics Project

Data Collection Procedures & Schedule:

Collecting data from experimental and control groups

Instruments:

Describes multiple methods

Excerpt 5 [\[Occidental College\]](#)

During the first three years of the program we will follow two groups of Occidental students, a control group and the project group. We will follow the two groups of students through their mathematics and physics courses and evaluate them in the same way. We will of course follow these two groups of students through their four years at Occidental and will continue to evaluate and follow subsequent groups of students who enroll in the integrated course.

During the first year the evaluator will create the measurement tools. These measurement tools may consist of a quantitative attitude assessment, a test of basic skills in calculus and physics, and a problem solving and synthesis assessment. They may also include such qualitative assessments as journals kept by selected students in the control and project groups and interviews (entrance, progress, exit, and post-program summative) with members of both groups. Finally, we will consider including a qualitative and quantitative measure of students' ability to discuss and analyze a significant problem in depth. Pairs of students from each group will be observed (or videotaped) by the evaluator as they discuss, analyze and solve a problem. Although this type of evaluation is more challenging to conduct and analyze, we believe that such qualitative results will be more interesting than the quantitative results of a written test.

Data Collection Procedures & Schedule:

Describes collection schedule

Instruments:

Describes measurement of outcomes using several questionnaires

Excerpt 6 [\[Anonymous 1\]](#)

Students in the experimental Integrated Introductory Biology-Chemistry Lab will complete a questionnaire at the beginning of their participation in the lab (Spring semester, freshman year), at the conclusion of the lab, and after their summer research internships (Fall semester, junior year).

Questionnaires will measure the following outcome variables:

1. Research knowledge: understanding of hypotheses development, experimental design, sampling, collection, analysis and interpretation of data; appreciation of the integrated nature of modern science and the complexities of research in biology and chemistry.
2. Research skills: proficiency in a variety of specific research techniques; self-reported ability to design and conduct experiments, reporting findings both orally and in writing.
3. Commitment to science: intent to continue with a major in biology or other field of science, and intent to pursue a career in science.

The questionnaire at the conclusion of the lab will also examine the students' experience in this innovative course and their reactions to both the content and the process of the course. Data will be gathered on the following:

1. Mentorship atmosphere: extent to which students had access to faculty, graduate and undergraduate

Student Assessment Instrument

Goal:	Significant change in knowledge of ecosystems management, facts, issues, alternatives, and problems.
Instrument:	Instructor evaluation of concept maps.
Administration:	Concept maps or "webs" are created on the first day of the second week as part of the field experience. A second web is created on day 4 of week 2 as a comparison.
Instructions:	<p>Students should start with the ellipse at the center of the page and build a concept map that depicts their personal knowledge and understanding of ecosystems management. Point values are assigned as follows.</p> <p>Vocabulary: 1 point for each term that is salient to ecosystems management (branched terms such as riparian, watershed, abiotic, biotic, organic, photosynthesis, producer, consumer, management plan, consensus, etc.)</p> <p>Concepts: 3 points for each concept identified in relationship to ecosystems management (separate ellipses for such ideas as baseline data, monitoring, consensus building, stakeholders, intervention, etc.).</p> <p>Actions/Relationships: 3 points for each connecting line that cites an action or relationship between terms or concepts (arrows and lines defined operatively such as, "is part of," "is restricted by," "is maintained by," "is governed by," "can be affected by," etc.).</p> <p>Interrelationships: 5 points for cited examples of recursive, cyclic, or complex interactions of ecosystem management. For example: economic limitations and management decisions interactions (arrows drawn and explained that show a high degree of exchange between sets of concepts or ellipses).</p>

Professional Development Follow-Up Instrument

Questionnaire for **Project PHYSLab** Participants

1. How many students are or will be using equipment and/or ideas picked up through Project PHYSLab? **Include your '96 - '97 classes**. Break this down by year if that will help you or just include all the students impacted by this program.
2. How many experiments have you added or will you insert into your physics curriculum as a result of attending Project PHYSLab? How many experiments did you revise as a result of the workshop?
3. How important was the equipment grant in making use of ideas learned at the workshop?
4. What pieces of equipment do you find most useful? Be specific. Examples: Motion Detector, Force Probe, ULI, MPLI, Smart Pulley, digital timer, CBL, accelerometer, PASCO 6560, and etc.
5. Have you planned or do you plan to share ideas learned from the workshop with other physics teachers in your school or your geographical area? Be specific if these workshops will include national meetings, state science meetings, or local gatherings (or individual) of physics teachers.
6. As you reflect over the past several months or years, what are the two or three greatest benefits you derived from Project PHYSLab?
7. Have you been able to acquire additional equipment similar to what we used in the workshop as a result of taking equipment away from PHYSLab? Be as specific as possible.

Report Excerpts – Environmental Science Teacher Education Project

Presents corroborative results from observations

HRI observations corroborated the teacher reports. Observed sessions were characterized by an atmosphere of respect and collaboration. Individuals were encouraged but not forced to participate in discussions and hands-on activities, and most did so willingly even when it came to pronouncing difficult Latin plant names in front of their peers. Facilitators provided new information and followed an organized plan for each session, artfully drawing on participants' creativity and past experiences by use of questioning strategies. It appears that the workshop experience itself has been fine-tuned over several years of implementation by the Museum.

Recommendations:

Suggests project improvements

As was true with Cohort 1 in 1996, the one aspect of the workshops which seemed somewhat less satisfactory to Cohort 2 respondents was the amount of time allocated for workshops. Written responses to the question about suggesting ways to improve the Program A workshops provide some insight into this complex problem for school staff.

Though only a few isolated comments indicated dissatisfaction with the use of workday or after-school hours, more prevalent was the sentiment that the sessions were rushed. Quite a few teachers commented that more time was needed to complete or prepare the areas or complete tasks. It appeared that teachers found themselves excited and enthusiastic time to complete the work necessary to be ready for the next phase of the professional development in approximately four weeks time.

(...)

Interpretations & Conclusions:

Interprets statistically significant results

Impacts on Preparedness

Participants were queried pre- and post- about their preparedness to teach various environmental science concepts. Results are shown in Table 7 below. Substantial and significant changes were found throughout.

Table 7: Percent of Participants Feeling Very well Prepared to Use the Environment in Their Teaching

Statement About Participant Preparedness	Percent of Respondents		
	Cohort 1 Pre	Cohort 1 Post	Cohort 2 Pre
Conduct hands-on activities with students that focus on plants and animals.	25	50*	27
Bring the outdoors indoors to teach science.	15	47*	19
Use the environment in the teaching of all subjects.	13	39*	14

Complete Report – Professional Development for Physics Instructors

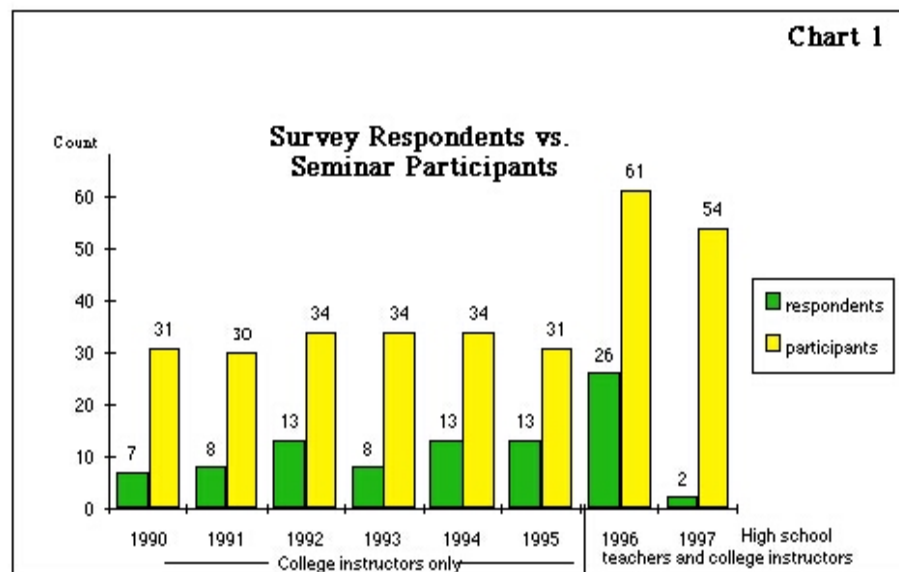
Dickinson Summer Seminars on Teaching Physics Using Interactive Teaching Methods on Computers

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II. Overview of the ITMC Survey Population

A total of 235 college instructors and high school teachers attended the summer seminar on teaching physics using Interactive Teaching Methods and Computers (ITMC) at Dickinson College between 1990 and 1996. College instructors have attended since the beginning, while high school teachers began attending in 1996. Of those in this targeted population, 35 could not be reached, or did not find it appropriate to respond for other reasons (e.g., several retired unexpectedly shortly after attending, others were graduate students who have continued their studies and have not yet entered the teaching field full-time). A total of 92 responses were received from the remaining target population of 200, for a response rate of 45%. A breakdown of respondents by year of attendance is provided in [Chart 1](#), below.



Of the 92 respondents, 73 (79%) were male and 16 (17%) were female (see [Chart 2](#)). Overall, the group was quite experienced, having taught physics for an

Alignment Table Example – Glossary, Quality Criteria, Standards



: Reports : Alignment Table

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OERL

plans

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curriculum development

teacher education

faculty development

laboratory improvement

under-rep. populations

technology

criteria

glossary

alignment tables

user scenarios

faq

Alignment Table for Report Components

All Components

The alignment table for sound project evaluation reports can be viewed either as a whole, displaying all components, or as six separate tables corresponding to report components: (1) Executive Summary, (2) Project Description, (3) Evaluation Overview, (4) Design, (5) Analysis Process, and (6) Results & Recommendations. See the [alignment table overview](#) for a general description of what appears in the alignment tables.

The [glossary](#) and [quality criteria](#) entries for report components are also available on their own.

All Components : [Executive Summary](#) | [Project Description](#)
[Evaluation Overview](#) | [Design](#) | [Analysis Process](#) | [Results & Recommendations](#)

Component	Glossary Entry	Quality Criteria	Related Program Evaluation Standards
Executive Summary	Summarizes the purpose of the evaluation, the project goals , implementation, impacts, conclusions , and recommendations.	The executive summary should provide essential information about the evaluation report that is easily understood by stakeholders . It should clearly summarize the purpose of the evaluation, the project goals , project implementation and impacts, and recommendations and conclusions drawn from the results of the evaluation.	U5 Report Clarity Evaluation reports should clearly describe the program being evaluated, including its context, and the purposes, procedures, and findings of the evaluation, so that essential information is provided and easily understood.
Project Description	Describes the evaluated project so that the reader of the report will understand the scope of the evaluation and be able to understand the association between the project's components and its outcomes		

Alignment Table with Pop-Up Definitions

OERL plans instruments reports search

overview curriculum development teacher education faculty development laboratory improvement under-rep. populations technology criteria glossary alignment tables user scenarios faq

Alignment Table for Report Components

All Components

The alignment table for sound project evaluation reports is organized into six report components: (1) Executive Summary, (2) Project Description, (3) Recommendations, (4) Conclusions, (5) Analysis Process, and (6) Results & Findings. See the [alignment table overview](#) for more information.

The [glossary](#) and [quality criteria](#) entries for report components are available in the [All Components Evaluation Overview](#).

Component	Glossary Entry	Related Program Evaluation Standards
Executive Summary	Summarizes the purpose of the project goals , implementation conclusions , and recommendations.	U5 Report Clarity Evaluation reports should clearly describe the program being evaluated, including its context, and the purposes, procedures, and findings of the evaluation, so that essential information is provided and easily understood.
Project Description	Describes the evaluated program so that the reader of the report will understand the scope of the evaluation and be able to understand the association between the project's components and its outcomes.	

Goal
A broad description of an intended outcome.

Interpretations
Meanings that have been inferred and extrapolated from the data (e.g., the scores were low relative to expectations).

Learning Assessment
A systematic measurement tool for capturing some aspect of learning.

Norm-Referenced
A scoring interpretation in which a test score is defined according to how others perform on the same test.

Objective

Professional Development Module on Methodological Approach and Sampling: Step by Step Introduction to the Strategy



· Designing an Evaluation: Methodological Approach and Sampling

[Introduction](#) | [Objectives](#) | [Strategy](#) | [Scenario](#) | [Case Study](#) | [References](#)

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Step 1. Identify assumptions about change.

Step 2. Decide how much you should be looking at implementation and how much at outcomes.

Step 3. Determine what types of data to collect, and whom to collect data from.

Step 4. If examining outcomes, determine where the desired outcomes fit on a proximal-to-distal continuum and how the evaluation will address them.

Step 5. Decide what, if any, comparison outcome data will be collected.

Step 6. Determine if data should be collected from an entire population or from a sample. If sampling, randomly select the sample from the population.

Step 7. Identify which attributes need special attention in the design, and determine how they should be attended to in the sampling process to avoid [bias](#).

Step 8. Minimize the effects of other sources of bias besides sampling bias.

Step 9. Determine the optimal sample size.

Step 10. Maximize the [efficiency](#) of your sample.

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Professional Development Module on Methodological Approach and Sampling: Details about Step 1 of the Strategy



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Step 1. Identify assumptions about change ([R](#)).

Your first step is to identify the assumptions of change that provide the rationale for the project. After all, the very word "intervention" reminds us that the project is intervening to change something. Defining what the intervention is supposed to change, and how, is a necessary preliminary to deciding how to measure its effectiveness. Ideally, the assumptions are grounded in theory, which means that they have research to back them up.

Different assumptions about the value of the project carry different implications for determining its worth. Sometimes, a project is theorized as providing a new and better solution to a commonly accepted problem. Such projects need to be evaluated on the basis of whether they solve previously defined problems better than alternatives do. Other times, the project is viewed as an opportunity to pursue new goals not previously articulated. An example would be a project that uses new learning technologies in an instructional context that are hypothesized to open up new possibilities for learning that were previously beyond reach of the learners in those contexts. Such projects need to be evaluated on whether they succeed in being the agents of the outcomes they are hypothesized to cause.

Therefore, you need to decide if the intent or intents of the evaluation should be to:

- Determine effects of the intervention (that is, causal relationships between the intervention and the outcome measures).
- Allow you to evaluate the strength and uniformity of the intervention across the different intervention participants.
- Help you explain the sources of variability in the results, provided that:
 - such an analysis is of interest to the stakeholder, and
 - additional conditions and factors have been identified that could be exerting an influence on outcomes.

Example

The administrators of a school district are concerned that not enough of their students are enrolling in science elective courses. They have read research literature promoting the notion that people become more intrinsically motivated about a subject if they are exposed to it in a

Professional Development Module on Methodological Approach and Sampling: Introduction to the Scenario (model application of strategy)



· Designing an Evaluation: Methodological Approach and Sampling

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A school district has to decide whether to adopt a new 8th-grade math activity book, "Math World." Math World is a supplement to the regular curriculum. It presents problem-solving activities on concepts such as number sense and spatial reasoning. The problems are designed to permit multiple solutions. Students are required to record their solutions in writing, and teachers are provided with scoring rubrics. The teachers in the trial will be introduced to the book in a one-day workshop right before the school year. The students are required to use the book one period a week.

Before deciding to adopt the curriculum districtwide, the superintendent wants to carry out an experimental trial. She is concerned whether the adoption would be equally appropriate at all the schools and whether it should be accompanied by extra teacher training at some schools. This is because some of the schools have a history of higher student achievement than others. There are 40 schools in the district with an 8th grade.

You are hired as an external consultant to do the evaluation. What do you do?

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Professional Development Module on Methodological Approach and Sampling: Introduction to Case Study



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This case study provides an opportunity to apply the strategies you just have learned.

Read the following case study. Then answer questions about it in the spaces provided. Click "View the Answers of Your Peers" if you want to compare your answers with those of other users of OERL. Click "View the Expert's Answers" if you want to compare your answers with those of experts.

Keep in mind that because evaluations are complex tasks, the expert's analyses are not the only plausible ones that can be made.

In contrast to the previously discussed scenario, which presents a fairly ideal project context for exploring an effect, the following case presents more challenges for the design.

Background

A large public university has eight science departments (biology, chemistry, etc.). Each department has an introductory course that all students must take first. Within a department, the courses share a common scope, sequence, and learning objectives, though individual instructors are given latitude on instructional methods. All instructors are required to administer a year-end, university-developed satisfaction questionnaire to their students. It consists of [scaled](#) items designed to measure how interested the students were in the material and how satisfied they were with the instructor's teaching. The results are archived in a database for 7 years.

All instructors are also required to administer a final exam, but they have freedom over the exam's format and content. They are also free to develop additional assessments during the course. As a result, there is considerable diversity in assessment procedures across courses. For example, some instructors grade solely on midterm and final exam scores; others grade on weekly or biweekly problem sets. Some instructors' tests are composed solely of multiple-choice questions; others require constructed responses.

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Professional Development Module on Methodological Approach and Sampling: Interactive Exercise in Case Study



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Now that you have read the details of the intervention, please answer the following questions.

Question	My Comments
1. Is the project mature enough to look at outcomes, or should it examine only implementation?	<p data-bbox="926 813 1535 850">Name (optional) <input type="text"/></p> <p data-bbox="926 878 1535 915">Email (optional) <input type="text"/></p> <p data-bbox="1640 854 1835 878">(What's This For?)</p> <p data-bbox="1268 967 1430 992">Your answer</p> <div data-bbox="890 1000 1793 1187"><input type="text"/></div> <p data-bbox="1562 1227 1892 1276"><input type="button" value="Post Your Answer"/></p> <p data-bbox="905 1317 1310 1341">View the Answers of Your Peers</p> <p data-bbox="1415 1317 1751 1341">View the Expert's Answers</p>
	<p data-bbox="926 1455 1535 1492">Name (optional) <input type="text"/></p> <p data-bbox="1640 1495 1835 1520">(What's This For?)</p>

Professional Development Module on Methodological Approach and Sampling: Feedback on Case Study User Response



Designing an Evaluation: Methodological Approach and Sampling

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Now that you have read the details of the intervention, please answer the following questions.

Question	My Comments
<p>1. Is the project mature enough to look at outcomes, or should it examine only implementation?</p>	<div data-bbox="800 740 1577 1279"><p>OERL Expert's Response - Netscape</p><p>Because the project has already had 2 years of implementation, the evaluator can focus on outcomes but also collect and analyze implementation data in order to account for the outcomes observed. At checkpoints throughout the third year, intermediate outcomes should be examined against benchmarks of student progress that reflect the expectations of the instructor. To measure a cumulative effect, outcome data should be collected at the end of the year.</p><p>Close Window</p></div> <p>(What's This For?)</p> <div data-bbox="1577 1000 1793 1187"></div> <p><input type="text"/></p> <p><input type="button" value="Post Your Answer"/></p> <p>View the Answers of Your Peers View the Expert's Answers</p>
	<p>Name (optional) <input type="text"/></p> <p>(What's This For?)</p>



Evaluation Design Strategies

METHODOLOGY

Identify the project's **assumptions about change**.

Decide **how much you should be looking at implementation and how much at outcomes**.

Determine what **types of data to collect, and who to collect it from**.

If examining outcomes, determine where the desired outcomes fit on a **proximal-to-distal continuum** and how the evaluation will address them.

Decide what, if any, **comparison outcome data** will be collected.

Evaluation Design Strategies – Links to the Collection

Link phrase: **assumptions about change**

1. briefly describes project goals and how the evaluation was designed to see if they were met (*[click to see report](#)*)
2. describes what the evaluators expected to find as an indirect result of the intervention (*[click to see report](#)*)
3. states the theories of change that were behind the intervention (*[click to see report](#)*)

Evaluation Design Strategies (cont.)

SAMPLING

Determine if data should be collected from an entire population or from a sample. If sampling, randomly select the sample from the population.

Identify which attributes need special attention in the design, and determine how they should be attended to in the sampling process to avoid bias.

Minimize the effects of other sources of bias besides sampling bias.

Determine the optimal sample size.

Maximize the efficiency of your sample.

Questionnaire Strategies - Appropriateness

1. Identify the goals and broad questions that underly of your evaluation
2. Identify the groups from which you need to get information
3. Justify the use of a questionnaire in the evaluation.

Condition A: You must be able to say “yes” to one or more of these questions about the population.

- Does it have opinions on the issues that interest you?
- Is it qualified to give you facts or informed judgments on the issues?

Is it the best or sole source of background information about itself (e.g., of background information that is either not available or not as desirable from alternative sources, such as test scores or other records)

Condition B: You must have a clear idea of what variables you want to gather data about, and you need to be reasonably sure you will get that data by posing the same (e.g., standardized) questions.

Condition C: You must believe that the respondents can be relied on to give you the information you need, perhaps with incentives. This means that they will be proficient enough in the language to comprehend the questions and repond properly, truthful, and motivated enough to complete the questionnaire and respond carefully

Questionnaire Strategies (cont.) – Writing Questions

Generate a list of purposes for your questions that address your evaluation goals.

Compose first drafts of the questions that correspond to your list of goals, and identify what they are supposed to indicate about the phenomena being investigated.

Determine whether each question should be open response or closed response.

Tailor closed response questions to provide maximum benefit.

Word all questions clearly so that respondents understand what you are trying to learn from them.