

Guidelines for Self-Evaluation of EOT-PACI Projects¹

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Since the start of the EOT-PACI Initiative in the Fall of 1997, the Evaluation Team from the UW-Madison's LEAD Center has been providing evaluation and consultation services to assist EOT-PACI partners in achieving their common mission. That mission is to ensure that all citizens have the opportunity to make productive use of emerging computing technologies that advance our ability to understand and solve problems in education, science, business, government, and society. The LEAD Evaluation Team assists EOT-PACI and its associated projects by: (a) conducting formative evaluations that provide feedback to developing EOT-PACI projects on their current strategies and how to best reach their goals, (b) conducting summative evaluations to document the impact of established EOT-PACI projects and to develop guidelines for replicating and scaling-up those projects; and (c) consulting with the EOT PACI Leadership Team on issues related to evaluation and self-assessment.

In FY'00, LEAD was asked to provide self-evaluation guidelines for those EOT-PACI teams and projects which have not had the opportunity or the resources to procure professional third-party evaluation. This document contains guidelines for self-evaluation and sample materials that have been developed with the special evaluation needs of the EOT-PACI partners in mind. It is hoped that these guidelines will be a "jumping-off point" for designing inexpensive, well-focused self-evaluations that provide reliable feedback on how well a project is addressing its goals and what can be done to increase its likelihood of success. Questions regarding these guidelines or how they may be used may be addressed to the LEAD evaluators using the contact information above.

The Purpose of EOT-PACI's Evaluations

Evaluations are designed to determine the progress of a project or group in meeting pre-specified goals and to make recommendations for how to better achieve those goals where progress has been lacking. **This means an evaluation cannot proceed until a project's or group's goals are specified.** It is also important to know how the evaluation data will ultimately be used. In some cases, the purpose of an evaluation is to allow an outside party to determine whether a project has proved successful enough to warrant support or emulation. In other cases, evaluations are used internally to assist a project in documenting its strengths and identifying its weaknesses so that the strengths may be built upon and the weaknesses addressed.

The purpose of EOT-PACI evaluations is to give projects and teams a reliable and fairly standardized mechanism by which to annually or semi-annually collect information about their

¹ Some portions of this document are adapted from an earlier LEAD report: Pfatticher, S.K.A., Bowcock, D., & Kushner, J. (1998). Program Assessment Toolkit: A Guide to Conducting Interviews and Surveys for Engineering Degree Programs. Madison WI: LEAD Center.

impacts, and to measure their progress towards achieving their goals and the goals of EOT-PACI as a whole (see Appendix A). Once collected, this information can be used for a variety of purposes, including:

- Informing EOT-PACI about a project’s or team’s progress and impacts—information which EOT-PACI in turn uses in their reports to NSF.
- Informing team members about their team’s strengths and weaknesses.
- Suggesting the means by which a project’s or team’s strategies can be made more effective and its weaknesses improved upon.
- Documenting the ways in which the members of a team are working collaboratively and pursuing common goals.

The Evaluation Process

Evaluation may be envisioned as an 8-step process, starting with establishing the purpose of the evaluation and concluding with putting the evaluation data to use. These eight steps are outlined in Figure 1 below. Steps 1-5 (above the dotted line) are the steps done in planning an evaluation, while steps 6-8 (below the dotted line) are what occurs in conducting an evaluation. When LEAD conducts evaluations of EOT-PACI projects, the first five steps are carried out prior to or within the first month of our work with a client and are referred to as a “planning evaluation.” The success and usefulness of the months of data collection that follows will depend on how carefully the project’s and evaluations goals and strategies have been outlined and understood in the planning evaluation. In many instances, planning evaluations provide the project administrators and staff with a richer and more coherent understanding of their project and its strategies than they had previously, allowing them to see—sometimes for the first time—the assumptions that underlie their project’s strategies and how well or poorly those strategies align with the project’s goals. For this reason, **all projects are encouraged to go through the process of a planning evaluation**—even if they limited resources for conducting surveys or interviews in the months that follow!

Figure 1: The Evaluation Process

Step 1: Establishing the purpose of your evaluation

Step 2: Articulating your project’s overarching goals

Step 3: Defining supporting goals/strategies that presumably address the overarching goal

Step 4: Defining the metrics that will be used to measure:
a) implementation of strategies (implementation measures)
b) progress towards goals (outcome metrics)

Step 5: Deciding what types of evaluation instruments will be used, with whom, and when (Evaluation design)

Step 6: Constructing evaluation instruments

Step 7: Collecting and analyzing the data

Step 8: Putting the data to use (Reporting findings summatively and utilizing them formatively)

We will now go through each of the steps in the evaluation process in more detail...

Step 1: Establishing the purpose of your evaluation

To establish the purpose of the evaluation that your project or team seeks to conduct, sit down with the administrators of the project or team and ask yourself the following questions. The more honest and comprehensive you can be in answering these questions, the better you will be at designing an evaluation that truly meets the needs of the project and its stakeholders.

- **Why** are you doing an evaluation?
- What will be done with the **evaluation results**?
- Who is the **audience** for the evaluation results?
- What are you trying to convince this audience to **do**?
- What **type of evidence** will this audience need to be convinced?

Record your answers and keep these answers in mind throughout your planning and conducting of the evaluation. There are numerous ways to conduct an evaluation—knowing **why** you are doing the evaluation in the first place and what you hope its outcomes will be will help you in choosing which paths to take.

Step 2: Articulating your project's overarching goals

The second step in evaluation is to articulate your project's or team's overarching goals. On the level of an individual project: What is the purpose of your project? What outcomes do you ultimately hope to achieve? On the level of EOT-PACI Teams, What do all of the projects within your team have in common? What is the desired impact that you hope your team as a whole will have on society at large? Most EOT-PACI projects and teams have known their overarching goal or had a sense of their common purpose since they were first established, but for the purpose of evaluation, it is not enough to just *know* the overarching goal. This goal or set of goals must be **stated in a way that all project stakeholders or team members agree upon**. A project's or team's overarching goal then becomes the standard against which the performance of the project or team is ultimately measured.

Stating the overarching goal of a single project should be fairly straightforward. But if you are doing a team-level evaluation, the overarching goal must be stated broadly enough to cover all of the projects within a team. In some cases, there may be more than one overarching goal. For example, the projects within EOT-PACI's Access and Inclusion Team share the following two overarching goals:

- To increase the representation of women, underrepresented minorities and the disabled in the computational sciences, computer science and engineering, and other fields that make use of high-performance computational resources.
- To ensure equitable access to high performance computational resources for all people regardless of gender, race, or disability status.

These two goals are pursued by all of the projects in the Access and Inclusion team and they are the goals that team members have agreed to work together in achieving. **It may not be possible to achieve the stated goals within the five years of NSF funding, but progress towards those goals must be demonstrated** by the team as a whole.

Step 3: Defining supporting goals/strategies that presumably address the overarching goal

In some senses, coming up with the overarching goals is the easy part. The next step, which requires somewhat more thought, is coming up with an ordered list of supporting goals and activities that a team or a project is using to address its overarching goal. In other words, supporting goals may be seen as “strategies” for meeting an overarching goal.

If you are a project director trying to make an ordered list of goals:

- your **overarching goal** = the desired ultimate impact of your project,
- the **supporting goals** = your project’s “steps along the way” to reaching that ultimate goal (i.e., we must achieve X before we achieve Y),
- and the **supporting activities/strategies** = activities or structural components of the project that are designed to address the supporting goals.

Figure 2 shows an example of the overarching goal and the supporting goals for an EOT-PACI project which LEAD has already evaluated, the Spend a Summer with a Scientist (SaS) program at Rice University. In parentheses after each supporting goal is one example of an activity through which this supporting goal or strategy was enacted.

Figure 2: An example of overarching and supporting goals from the SaS program

Overarching Goal: Increase the number of women and underrepresented minorities in the computational sciences by improving the recruitment and retention of underrepresented graduate students.

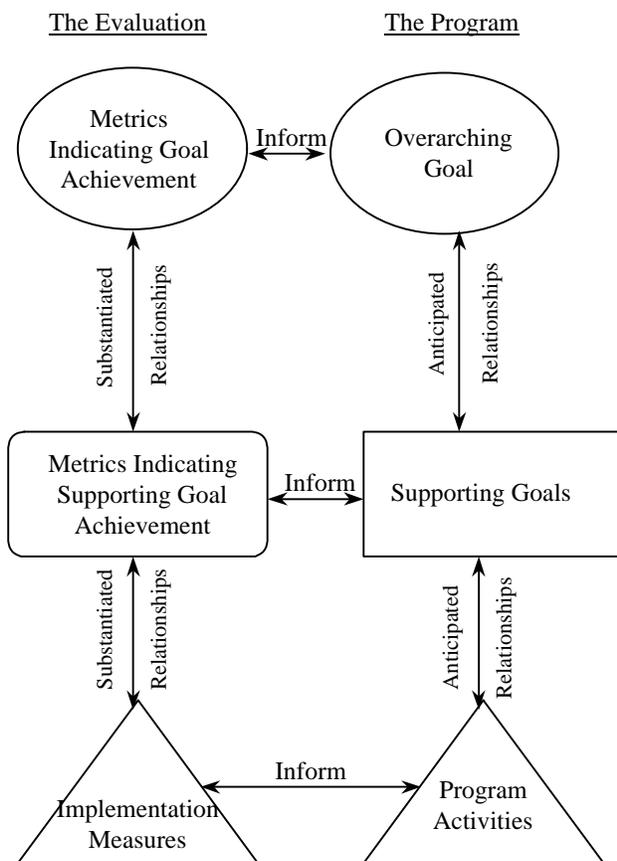
Supporting Goals/Strategies (presumed to support the overarching goal):

- Develop a community of minority peers and role models
- Get students involved in research
- Assist in professional development
- Provide financial support
- Provide academic support
- Provide faculty mentoring and role modeling

It is initially presumed that the supporting activities, if properly enacted, will lead to success in the supporting goals, and that the supporting goals, if achieved, will lead towards progress on the overarching goals. **But it is only through the process of evaluation that one can determine whether the goals and activities that one presumed would “support” an overarching goal do actually support it.** In this sense, supporting goals and activities are like hypotheses that need to be tested. Through evaluation of the project’s implementation and its outcomes, one gathers evidence on the validity of these hypotheses. If the hypotheses are not supported, it could be that the activity/project merely needs adjustments (it is not being properly enacted). On the other hand, it could mean that the supporting goals/strategies being used to address the overarching goal are off the mark and need to be reconsidered altogether. These ideas are illustrated graphically in Figure 3 below. What this figure shows is how the project and the evaluation both inform and are informed by each other, and how each level of a project—its overarching goal, its supporting goals, and its program activities or strategies—has a corresponding level of measurement within the evaluation.

In the evaluation of teams, it is important to consider not just the goals that are being pursued by individual projects, but the common purpose and collaboration-related goals that are being pursued because a group of projects is trying to work as a team. One must ask: what supporting goals and activities are being pursued by my team as a whole that a single project would not be pursuing on its own? Team-related goals have to do with how projects relate to one another, collaborate with one another, conduct business within the team, and present themselves as a team to the outside world.

What evaluation attempts to do



Step 4: Defining the “metrics” which will be used to measure progress towards each goal

Once a team’s or project’s goals have been listed in an ordered way that allows one to see the connections between overarching goals, supporting goals, and project activities, it is much easier to come up with metrics to measure one’s progress in achieving those goals. “Metrics” is a word that has been used a lot in evaluation-related conversations within EOT-PACI. But what is a metric, exactly, other than something we want to measure? And how does a team or project decide what its “metrics”—or standardized measures—should be?

The easiest way to understand metrics is to view them as specific, standardized questions regarding progress toward a goal. During the evaluation, performance on each metric will be measured through particular survey questions, interview questions, or tracking database analyses. Figure 4 gives an example of the overarching goal pursued by one EOT-PACI related project—the Advanced Networking with Minority-Serving Institutions project recently funded by NSF. It then lists possible metrics that could be used to measure progress towards this overarching goal.

Figure 4: An example of metrics for an overarching goal

AN-MSI Overarching Goal: To assist Minority-Serving Institutions as they develop the campus infrastructure (hardware and IT personnel) and national connections (Internet connectivity and collaborations) to become full participants in the emerging Internet-based information age.

Possible metrics:

- ✓ Interviews with campus representatives indicate positive and significant upgrades in their campus architecture due to participating in the project
- ✓ Participating institutions show significant growth in number and speed (bandwidth) of connections since beginning of project
- ✓ Participating institutions show significant growth in the number and degree of technology-related collaborations
- ✓ Quality and speed of Internet access at participating institutions significantly improves
- ✓ % of participating institutions that meet the technology goals they have established through the project
- ✓ % of participating institutions that have an ongoing process for IT strategic planning
- ✓ Interviews or case studies indicate significant improvements in campus’ ability to incorporate technology into their teaching, learning, and research

Coming up with the metrics for one’s overarching goal is a critical part of the evaluation process that should be addressed during the planning stages of the evaluation. These metrics are used to define what a project and its stakeholders think are important, and, therefore,

what sort of activities and goals the project should pursue. But for this very reason, one must be careful in selecting one's metrics to **make sure that the things that are measured by them are the things that one really values**. Recall that the standardized tests used by many of our schools do not offer the best measure for the things some teachers really value (like critical thinking and communication skills), but their very existence forces many classrooms to focus their effort on other, fairly shortsighted goals (like passing the district's standardized tests).

Keeping this example in mind, when you are devising metrics for an EOT-PACI project or team, it is important to make sure that: (1) there is a consensus among project stakeholders that the metrics are measuring something of value; and (2) the project re-assesses its metrics each year to ensure that they are providing useful information and guiding the project in the desired direction.

It is also necessary to come up with metrics and measures for each supporting goal, but these measures and metrics are less complicated and less controversial and may be developed as needed during the course of the evaluation. There are two types of assessment measurements that must eventually be developed for each supporting goal: (1) **implementation measures**, which measure how well supporting activities are being implemented; (2) **outcome metrics**, which measure how much progress is being made towards a particular supporting goal.

Step 5: Deciding what types of evaluation instruments will be used, with whom, and when (Evaluation design)

Once you have articulated your program's overarching goal and supporting goals, there are a variety of evaluation tools you can use to collect information about your program and its progress towards these goals. The tools you select should be consistent with the type of information you seek. In some cases, several tools may be needed to address a breadth of issues. Using a variety of tools is often beneficial because the information gathered by some tools can be compared with information from other tools (this allows one to confirm findings between sources), or can deepen your understanding about the issues raised through one method. Some researchers purposely use a variety of different tools to see if they reveal similar findings and to supplement and deepen their understanding of information – this is called “triangulation.”

An example of an evaluation design that incorporates multiple tools would be:

1. Conduct a **focus group** with a representative sample of the participant population to identify issues; then develop a survey based on the issues identified by the group.
2. Distribute the **survey** to the entire participant population.
3. After analyzing the survey responses, conduct **individual interviews** with a representative sample to explore the issues in greater depth.

The rest of this document focuses on providing guidelines for developing and conducting surveys and interviews, although critical evaluation data can also be collected through analyzing program databases, program records, and student records, or conducting observations of program activities in a careful and structured way. Choosing the right tool to collect the type of data in which you are most interested is an essential part of evaluation design. Figure 5 lists the advantages and disadvantages of a few selected types of tools which may be used either in isolation or in combination. Your decision about the tools you select depends in a large part on the purpose of your evaluation and the available resources for conducting it.

Figure 5: Evaluation Tools - Advantages & Disadvantages

Tool	Advantages	Disadvantages
Survey In-class survey	Inexpensive. Can be quickly administered to group. Best suited for simple and short questions. Can reach every participant.	No control for misunderstood questions, missing data, untruthful responses. Not suited for exploration of complex issues.
Survey Mail survey	Comparatively inexpensive. Can attempt to reach participants over a wide geographical area.	No control for misunderstood questions, missing data, untruthful responses. Not suited for exploration of complex issues. Sometimes low response rate. Takes times to receive responses.
Survey Telephone survey	Relatively inexpensive. Best suited for relatively short and non-sensitive topics. Can attempt to reach participants over a wide geographical area.	Sometimes difficult to reach subjects. Usually requires a sample of respondents. Not suitable for lengthy questionnaires and sensitive topics. Respondents lack privacy and anonymity. Interviewer requires skills.
Interview In-depth individual interviews (Can be done by phone or in-person)	Interviewer can probe evasive answers and explore topics in depth, and clarify questions. With good rapport, may obtain useful open-ended comments. Usually yields richest data, details and insights. Best if in-depth information is wanted. Permit fact-to-face contact with respondents.	Same as above. Often time-consuming to analyze due to volume and qualitative nature of data. Interviewee may distort information through recall error, selective perceptions, desire to please interviewer.
Interview Focus group Interviews	Useful to gather ideas, different viewpoints, new insights, improving questions design.	Must take a sample. Limits time that each individual has to contribute. Lacks individual privacy, thus could reduce accuracy of results.

*This table is modified from the User-Friendly Handbook for Project Evaluation: Science, Mathematics, Engineering and Technology Education, EHR-DREC, National Science Foundation

Project databases and the importance of keeping good records

Regardless of the type of evaluation tools you use, your evaluation will be much easier and much more useful if you have already established and maintained a project database that tracks all essential information about project participants and project outcomes. **Both in running a project and in evaluating its impacts, it is essential to keep good records and to update them frequently.** Any project information that you have failed to document and maintain in your records will compromise your ability to fully understand the successes and failings of your project. If you do not already have such records, the first step in your evaluation should be to establish and maintain a database on all project participants that includes each participant's:

- (a) demographic information and relevant background information;
- (b) complete contact information, including email addresses, phone #s, and current and permanent mailing addresses; and
- (c) any data collected during or after the project that relates to your metrics.

Having such information in a readily accessible and well-organized database ensures that you will be able to:

- Keep track of who, how many, and what types of people participated in each session/year of the project;

- Contact current and former participants in order to provide project-related information or to track participant activities and project outcomes over time;
- Send surveys or contact participants for interviews in order to evaluate your project;
- Organize all the essential information about your project and its metrics in one place;
- Make it possible for your project to be evaluated by external evaluators.

Make it a priority to make the records in your project database as complete as possible and be sure to update them at regular intervals. It is a good idea to include as one of your datafields or data columns the day/month/year of the last update for each participant's record.

Step 6: Constructing evaluation instruments

Step 7: Collecting and analyzing the data

Even after one has defined the metrics one will use to measure progress towards a project's goals, there is still the difficulty of constructing, utilizing, and analyzing data from evaluation instruments in a way that will reliably and accurately measure progress on one's metrics. For these steps of the evaluation process, we think it is most useful to discuss surveys and interviews separately. In the three sections that follow, we offer guidelines on how to construct, utilize, and analyze the data from each type of instrument, and we discuss some ethical considerations that must be taken into account when using these instruments.

Section 1: SURVEYS

Surveys are an efficient way to gather detailed quantitative and qualitative information about your program's impacts and outcomes. Because PACI's Education, Outreach, and Training programs are so different in their goals, participant demographics, structure, and activities, we can only offer here the most general suggestions on how to construct and conduct surveys for these programs. For those of you who want more detailed assistance, *THE SURVEY KIT* by Sage Publications (Arlene Fink, editor) provides a straightforward and comprehensive primer on survey construction and analysis. This kit includes 10 booklets on every aspect of survey construction, delivery, and analysis, and may be ordered via email at order@sagepub.com. In this section, we will merely offer tips on how to conduct a survey and general guidelines on how to write survey questions. In Appendix B, we have included examples of surveys LEAD created for two EOT-PACI programs we have already evaluated and a survey template for instructors interested in evaluating the effect of using HPC technology in their courses. We hope these models will be of some guidance in constructing your own survey questions.

Guidelines for administering surveys and increasing the response rate

The main advantage of surveys over interviews is that they allow you to quickly and cheaply collect evaluative data from large numbers of people—perhaps even your program's entire participant population. Of course, this advantage is of little use if only a small percentage of the target population fills out and returns your survey. **The higher the response rate for a survey** (the number of people who returned a completed survey divided by the number you believe received the survey), **the more accurate and reliable its results will be.** Hence, anything you can do to increase response rate will make your evaluation more useful and its reported results more convincing. As a rule of thumb, response rates lower than 30% are likely to be biased or

otherwise unreliable (those who don't return a survey are often those for whom the project had the smallest impact or least benefit), and it is often not advisable to publicly report survey results if the response rate is lower than 50% (especially if the demographics of the respondents are significantly different from the demographics of the participant population as a whole). Below are guidelines for how to administer surveys in ways that will maximize your response rate.

- Administering surveys to a “captive audience” or **making the completion of the survey a requirement of being in the program/course greatly increases the response rate**. If you are conducting a survey as part of a course evaluation, give students time to fill out the survey in class or make it part of a homework assignment. If are conducting a post-program evaluation or “exit” survey, it is often better to survey participants right before they leave the program as opposed to after they have left.
- **The more convenient it is to fill out and return a survey, the higher the response rate**. With EOT-PACI's highly “wired” and computer-literate populations, the best way to send out a “follow-up” survey (one that measures the impact well after a program has ended) is by email. If the program or tool you want evaluated is on-line, you may also place your survey on-line, but make sure that there are vivid and explicit links (flashing hotlinks, for example) that direct your on-line readers to the survey and encourage them to fill it out. If your program or tool is not fully on-line, trying to get participants to go on-line to fill out a survey tends to result in a low response rate.
- **Keep the survey as short as feasible to get the information you need**. Long surveys are sometimes necessary to get all the data you want, but each question you add reduces the likelihood that a respondent will take the time to complete the survey. All things being equal, short is better than long, but not at the expense of a logical design.
- **Give participants sufficient time to fill out your survey**. If it will be conducted in-person, have someone pre-test the survey so you know about how long it takes to fill out and give your participants several extra minutes on top of that. If you are mailing a survey, allow time for the survey to be delivered both to and from the participant. Give participants, even those on email, at least a week but no more than 2 weeks after they have presumably received a survey to return it to you.
- Unless you have an on-line survey that is a permanent feature of a site, it is essential to **put a well-marked deadline on the survey**. This deadline should allow sufficient time for you to enter each survey into a database (which can occur automatically with on-line surveys) and perform analyses before the data is needed.
- If the best way to get a survey to participants is through the postal mail, be sure to include a **stamped, self-addressed envelope for its return**.
- **Plan to do two mailings**, whether by postal mail or email. The follow-up mailing (sent only to those who have not yet responded) can increase your response rate by as much as 50%.
- One effective way to increase response rates is to include a short cover letter or email with a personal appeal from the program director. **Personalize the letter/email** whenever possible (“Dear Mr. Smith” instead of “Dear Participant”) and make it clear that the survey results will be used to improve the program and enable the program and its funders to assess the program's value. **Let each participant know that their input is important to the future success of the program**.
- For projects in which interactions with participants are short-lived or not very intensive, you may want to **use material incentives to increase response rates**. For example, you could promise to mail back a merchandise- or service-related coupon once the completed survey

has been received, or you can put a number on the top of the survey that becomes part of a drawing to win a prize. (The latter option is cheaper but somewhat more labor-intensive.)

- Sending paper-based surveys on **colored paper can also increase your return rate**. We're not sure why this is—perhaps it makes it easier to find the survey in the growing pile on one's desk!
- **Identify one person on your staff to keep records** of who has been sent the survey and to do follow-up mailings as needed.

Guidelines for constructing survey questions

While survey data can be invaluable in helping you to assess a program's impact and improve its strategies, a poorly-designed survey with poorly-worded questions is not only useless, but misleading. To make the most out of your survey, keep your overarching goals and supporting goals firmly in mind. Then, formulate three types of questions based on these goals:

- (1) questions that assess whether the program activities and strategies meant to address these goals are being **implemented as intended**;
- (2) questions that explore the **impact or success** of these activities and strategies;
- (3) questions that ask for **recommendations on how to improve** the activities and strategies

In deciding what to ask in a survey, it is useful to consider all the **different content areas** one may have questions about. Most surveys will include questions in the areas below. Use these areas as a guideline in coming up with questions of your own:

- Participant background and demographics: These questions allow you to describe your participant population and to see whether participants with different background characteristics respond differently to your program and the questions you ask about it.
- Participant self-ratings: These are questions in which participants rate themselves on factors like confidence, skill level, aspirations, knowledge of a particular area, or whatever else about your participants that you are hoping to impact with your program. These ratings are especially informative if you conduct both a pre-program survey and a post-program survey, as this allows you to assess changes in the self-ratings over time. However, to be confident that any changes seen are due to the program, it is always necessary to *ask* respondents in the post-program survey whether they think the program is what produced the changes in their self-ratings.
- Questions about the program overall: These questions deal with the overall impact of your program and are closely tied to your overarching goals for the program. Participants' responses should allow you to make some general statements about how well your program is doing at meeting its goals or showing indications of progress towards its goals.
- Questions about particular elements of the program: These questions allow you to narrow down what program elements are working and what aren't and to assess and compare the impact of different elements of your program.
- Questions about participants' progress and post-program activities: These are "impact" questions that are only asked in follow-up surveys well after a program has ended. Such questions allow you to track what participants have done after their involvement in the program and assess whether they are progressing towards the program's goals.
- Questions about participants aspirations or future plans: These questions offer the best available prediction of what outcomes your program may produce down the road.

Whether these predicted outcomes are ever realized can only be verified through tracking of participants or follow-up surveys.

- Detailed feedback questions: These open-ended questions allow you to get information from participants about the benefits and drawbacks of your program and their recommendations for improving it. It allows participants to speak for themselves, without being constrained by the answers you yourself were able to generate. These questions often provide the most detailed and most useful information about how to refine and improve a program.

Most surveys also use a combination of different **question formats** to get the information they need in a form that can readily be analyzed. Here are some of the question formats one can use and the benefits of each:

- Multiple choice questions, the most common type of survey questions, allow you to say what % of your participants felt, believed, or experienced certain things having to do with your program. These questions can be forced-choice (pick just one), or allow for multiple responses. Make it clear in the directions to each question whether respondents should choose just one or multiple options, and realize that you will have to analyze these two types of questions differently. Only forced choice questions allow you to place respondents into mutually-exclusive categories.
- Numerical rating questions ask respondents to rate a program element on some factor, using a numerical scale. This scale can start with either the highest number or the lowest number as long as you are consistent throughout your survey. Unlike other question formats, numerical rating questions allow you to calculate means or “average responses.” Whether the numerical scale has an odd number of points on it (e.g., a 5-point scale) or an even number of points on it (e.g., a 6-point scale) depends on whether you want to force respondents to have to respond in either a “favorable” or “unfavorable” way or whether you want to give them the opportunity to be “neutral” (the midpoint of the scale). If you have a scale with an odd number of points, participants have the option of choosing the exact middle (“neutral point”) of the scale. You may use positive and negative numbers in a scale (e.g., -2, -1, 0, 1, 2) if this makes sense and you will still be able to calculate an average response.
- “Likert-scale” type questions have opposing adjectives on different sides of a scale, like “very easy” and “very difficult.” In some cases, there are just numbers or points between these two adjectives, and respondents are asked to circle or mark where on the scale they fall. In other cases, each point on the scale is marked with an adjective that falls on the same scale (e.g.: “very easy,” “fairly easy,” “fairly difficult,” “very difficult”). If you use numbers on your Likert scale, you may compute “average responses,” but if you use words to label intermediate points on the scale, calculating means is no longer appropriate. Instead, use percentages to indicate what % of participants responded each way.
- Rank order questions allow participants to rate all of the elements or activities of a program according to their usefulness, value, enjoyment, or any other factor, with the element they think is at the top of the scale receiving a “1,” the second highest receiving a “2,” and so on. This allows you to compare program elements and assess their relative value.
- Open ended-questions allow respondents to speak for themselves and give open, personalized responses that are more true-to-their-experience and more detailed than any fixed-choice answer you may have come up with on your own. These questions are less

convenient to code and analyze than other survey questions, but they often allow you to learn things about your program that fixed-choice questions would miss.

Finally, when designing your survey and deciding on the wording of its questions, keep these general guidelines in mind:

- **For every survey question you construct, keep in mind what you ultimately want to do with the data from that question.** Every survey question should be useful in allowing you to either: describe your program’s participants and their background, monitor and assess the impact of each of your program’s activities or features, assess the impact of your program overall, or provide clues about what works well in the program, what doesn’t work, and why.
- **Construct the database for your survey analysis as soon as you have written the survey.** Make sure that for each question you have a clear understanding of how the responses will be coded, entered, and analyzed. In many cases it is helpful to merge the program participant database with the survey database so that all the information about a participant is in one place.
- **Do not write questions that ask more than one thing at a time.** This makes it difficult to analyze the responses, because it is unclear which part of the question someone has responded to. For example, consider a question like: “In general, were you satisfied with the accessibility and ease-of-use of this tool?” If someone says “no,” which of these two things was the problem? One could get more specific and useful information if this were split into two questions, one about accessibility and one about ease-of-use.
- In terms of organization, put **more general questions before more specific questions and behavior/knowledge items before opinion items.**
- Survey construction is both a science and an art, and even seasoned professionals often wind up writing at least one question that is ambiguously worded, confusing in how to respond, or that fails to really address the issue as intended. For this reason, it is essential that you **always have someone else read and fill out your survey—a pilot survey—before you administer it to participants.** The more people who pilot the survey and the more similar these people are to the participants that will eventually take the survey, the more likely it is that you will catch poorly-constructed or poorly-worded questions before any data is lost.

For examples of surveys that have been designed for EOT-PACI projects, see Appendix B.

Section 2: INTERVIEWS

Interviews are a more labor-intensive means of collecting information about your program and its impact on participants, but they have greater potential than surveys to provide detailed information on particular aspects of your program. Whether conducted individually or with “focus groups,” **interviews are better than surveys at exploring participants’ own point-of-view about your program and their experiences in it.** In contrast to surveys, interviews allow you to clarify respondents’ answers and follow up on unanticipated issues that arise in response to your questions. Hence, interviews can provide valuable information on topics that survey questions might have missed.

This section summarizes many of the important points you should consider if you decide to use

interviews to evaluate your program. The section also gives general background information about conducting interviews in various formats such as individually or in groups, over the phone or face-to-face, and tape recorded or not. The section discusses these formats, poses questions to consider when planning interviews, provides checklists and worksheets for conducting interviews, and discusses methods for analyzing interviews. In Appendix C, we include a sample interview protocol from an already-evaluated EOT-PACI program.

Questions to consider prior to interviewing

1. What is the purpose of the interviews?

Personnel who will be conducting the interviews need to communicate clearly with all interviewees the purpose of the interviews and what the data will be used for. The use of interviews as a data collection method begins with the assumption that the participants' perspectives are meaningful, knowable, and able to be made explicit, and that their perspectives are important to the success of the program.

2. Who will do the interviews?

- a. The interviewers you select should be interested in the project, have time to participate, and be good listeners. In each case, the interviewer should be a person with no past, present, or likely future authority over the person being interviewed, and someone who is capable of facilitating an open discussion without passing judgment on the interviewee's responses or leading him or her to make specific responses.
- b. If possible, a small group of interviewers (two to four) should collaborate on the interview process. Using multiple interviewers allows interviewers to be assigned to interviewees they do not know. It also provides a range of interviewer backgrounds which can broaden the interpretation and understanding of the findings (this is one form of triangulation).
- c. It is important that one person act as a "point person" for the entire interviewing process. This person will coordinate all of the activities and serve as a conduit for information.

3. Should we conduct individual or group interviews?

Some factors to consider when contrasting individual and group interviews are shown later in this section in a table titled: "Which to use: Focus groups or In-depth interviews?" To be useful, individual interviews generally need to be at least 30 minutes, preferably 45 minutes to one hour. Group interviews usually run from 1-2 hours.

4. How many interviews should be conducted? Should we select a sample?

You need to conduct enough interviews so that similar responses or patterns begin to occur. This can usually be accomplished by 12 to 20 individual interviews, depending on the heterogeneity of your participant population. (If interviews are being used to supplement the representative data you have already collected from a sufficiently large survey sample, fewer interviews may be done.) Because some people may choose not to participate in the interviews and others who do agree may not actually show up, you may need to ask about 25 people to participate in order to accomplish 20 interviews.

Since most programs do not have resources to interview every participant or stakeholder, you will likely need to ask a sample to participate in the interviews. Some suggested ways to select a sample to interview are presented below.

- Invite a percentage at random: If you want to select 25 students out of 50, for example, you can choose every other name on the student roster.
- Invite everyone in the targeted group: You can ask everyone (through posters, e-mails, or phone calls) in the program to participate in an interview. Then wait to see how many respond and confirm interviews with the first 25 who respond to your request. This is an efficient way but may not allow for a very representative sample.
- Invite a representative sample: For a sample to be representative of the entire population, your sample should reflect proportions of the entire population based on criteria you identify as important. While these criteria will vary for different groups, some of the most commonly used criteria to select a sample are: gender, ethnicity, academic field, or year in program.

5. How should we invite people to be interviewed?

The easiest way to invite people to be interviewed is by e-mail or telephone. Now that most people have e-mail access, this is often the most convenient medium because it is easy for people to respond. Allow several days for people to check e-mail messages. Telephone contact is tedious and often requires back-and-forth messages. If you plan to do phone interviews, call the person and ask if they will agree to an interview, and then set a convenient date and time that you can call them back.

6. Should we provide questions to interviewees ahead of time?

Many interviewees report that it is helpful to see the questions ahead of time because it allows them time to prepare thoughtful answers and can improve the quality of the responses you receive. In other cases, however, you may want a spontaneous rather than a prepared response to your questions. Giving out the questions ahead of time can result in more stilted, “formulaic” interviews because both the interviewer and the interviewee know what the “script” is supposed to be and tend to stick to it rather than going with the flow of the respondent’s own perspectives. In most LEAD interviews, we do not give the questions out ahead of time, but we do tell participants when we first contact them what the interview is about and what topics we are interested in exploring.

7. When should we interview?

Interviews can be done during a program or after it is over (the latter is most common). How long after the program depends on whether you are more interested in assessing outcomes (in which case you will have to allow time for certain outcomes to emerge) or whether you are trying to get feedback on particular elements of your program or tool (in which case you should do the interviews soon enough that participants have not forgotten the details of their experiences). If possible, try to conduct all interviews that use the same protocol within a concentrated two-week long to one-month long period. Keep your interviewees’ own schedules in mind and suggest interviews at times that are likely to be convenient for them. Always clear some extra time in your own schedule in case the interview starts late or runs longer than expected.

8. How can we practice interviewing?

It is useful for people who are not experienced at interviewing to practice one or two interviews with friends or colleagues prior to conducting real interviews. Practice allows the interviewer to become familiar with recording equipment, to practice putting a person at ease, to practice pacing so the interview is completed in the allotted time, and to try out questions that may be sensitive or difficult to ask.

9. Where should interviews be conducted?

Ideally you should choose an infrequently-used or private location to minimize background noise and interruptions. The location should be quiet enough to hear respondents, and one that is comfortable and easily accessible. Seating arrangements should encourage involvement and interaction and break down status and power relationships that may exist. If possible, place seats side-by-side instead of having the interviewer sit behind a desk. Group interviews are best done around a table so that everyone can see and hear each other.

10. Should we tape record or not? Should we transcribe or not?

There are three approaches to making records of interview data. The advantages and disadvantages of each are described below in Figure 6.

Figure 6: Approaches to Recording Interview Data—Advantages and Disadvantages

Approach	Advantages	Disadvantages
<p>Tape-record and transcribe verbatim Word-for-word transcription is completed. This requires resources and time, but is valuable when respondent’s own words and phrasing are needed.</p>	<p>Completeness and the opportunity it affords the interviewer to remain attentive and focused during interview. Allows other interviewers to read the transcript and collaborate together on analysis.</p>	<p>Amount of time and resources needed; inhibitory impact tape recording has on some participants. It is essential that interviewees are assured of confidentiality and permission to tape is obtained.</p>
<p>Take notes, tape-record, but do not transcribe This approach draws on the notes taken by interviewer. As soon as possible after the interview, the interviewer listens to the tape to clarify certain issues and to confirm that all main points have been included in the notes.</p>	<p>Recommended when resources are scarce, and when the results must be provided in a short period of time. Note expansion saves time and retains all the essential points of the discussion.</p>	<p>Interviewer may be more selective or biased in what he or she writes.</p>
<p>Take notes but do not tape-record Interviewer takes detailed notes during the interview and draws on memory to expand and clarify the notes immediately after the interview.</p>	<p>Useful if time and resources are short, results are needed quickly, and evaluation questions are simple.</p>	<p>The interviewer must frequently listen, talk, and write at the same time, a skill that is hard for some to achieve. Where more complex questions are involved, note taking alone does not allow one to document all of the intricate relationships and descriptions.</p>

11. How can we assure confidentiality and anonymity?

Please see Section 3, which summarizes issues related to evaluation ethics and the use of a consent form. A goal of interviewing is to gain adequate information about your program. Most interviewees are more inclined to participate in interviews if they know that what they say will remain anonymous, if they believe that there will be no negative repercussions to their opinions, and if they are assured that their interview tape will be used for analysis purposes only. Some ways to address these issues are to use a consent form, assign ID numbers instead of student names to the audiotapes, remove the tapes from the interview area promptly after the interview, and design the analysis phase so that only the transcriptionist or interviewer listen to the tape and only one or two people actually read transcripts. After analysis, completed audiotapes and typed transcripts should be stored in a safe location. Although the use of a consent form is optional

when doing program assessment activities, it is considered good practice to ensure that procedures were communicated in an open manner and to notify interviewees about process and confidentiality.

12. What problems might we anticipate?

Some problems you might anticipate and their solutions are summarized in the table that follows.

Problem	Description/Solution
Interviewee does not show up	Some interviewees will not show up, or if you are doing phone interviews, will not be available at the time you have arranged to call them. It is appropriate to try to re-schedule the interview, but discontinue efforts after one more contact.
Interviewee is very uncomfortable talking about issues or becomes emotional	Depending on the types of questions, it is possible that interviewees may be uncomfortable discussing certain topics or some may become emotional and cry or withdraw. If this occurs, tell the interviewee it is OK. If you are taping, offer to turn off the tape recorder, and offer to take a few minutes break. Ask if the interviewee would like water. Take a break from questioning or ask if you should proceed.
You run out of materials	Have extra materials: copies of questions, paper and pencil, consent forms, batteries, blank tapes.
Interviewee confides important information	It is possible that the interviewee may reveal information related to issues such as harassment, unethical, or illegal activity. In the event this occurs, refer the student to the appropriate office or counselor. A list of these references is provided in the resource section at the end of this kit.
Equipment Fails	Equipment failure happens. Have extra equipment on hand. Encourage interviewers to take some written notes and check the tape recorder during the session. After the interview is completed, the interviewer should also check the tape. If the machine did not work, the interviewer can create a written summary based on notes while the discussion is still fresh in the interviewer's mind.

Developing interview questions

Developing interview questions is similar to developing survey questions in terms of the general topics you want to ask about, but very different in terms of *how* you ask the questions. The point of doing an interview instead of a survey is that it gives the interviewer more flexibility in what they ask and the respondent more freedom in how they respond. Although one should always prepare the list of interview questions ahead of time—and this list will include some questions to be asked of all interviewees from that category—the interviewer may add or skip questions as needed to pursue topics of interest and make the interview as relevant as possible to the individual's experiences. **The goal in interviewing should be to elicit and discover an individual's perspectives, not to check off their responses to the questions on your list.** (If you want to do the latter, conduct a survey!) In LEAD interviews, we always prepare a detailed list of interview questions (called a "protocol") and try to put them in an order that makes sense. However, it is not unusual for our interviewers to change the question order, skip questions, or add questions of their own as the situation demands. This is a key difference between interviews and surveys. (Survey questions, whether written or read aloud, must always be asked in the same way and in the same order).

As with surveys, interviews often include questions about the respondents' background, their reasons for being in a program, their earlier relevant experiences, their experiences in the program, their experiences with and impressions of particular program elements, their opinions on what works well and what doesn't, and their recommendations for improvement. **Interview questions should not be written in such a way that they elicit simple "yes" or "no" responses (unless you are planning on following up with a question that elicits more detail).** The questions should also avoid "giving their own answers" or leading people towards a particular response by the way they are worded. In Appendix C is an example of an interview protocols that LEAD developed for an EOT program we have already evaluated. You may find it helpful to use this protocol as a rough guideline for how to write interview questions for your own program.

Tips on Interviewing

An interview is the evaluation tool to use when interpersonal contact is important and when opportunities for follow-up of comments are desired. In-depth interviews are characterized by extensive probing and open-ended questions. They are particularly appropriate when seeking an understanding of complex or highly sensitive subject matter. Typically the interviewer works from a list of questions or issues that are to be explored (a protocol) and probes areas of particular interest. The protocol helps the interviewer pace the interview and makes the process more systematic and comprehensive.

Interviewers should seek to encourage open responses. It is important for an interviewer to capture respondents' perspectives in their own words. An interview is like a guided conversation in which the interviewer becomes an attentive listener. In contrast to a normal conversation, an in-depth interview is not intended to be a two-way form of communication and sharing. The key to being a good interviewer is being a good listener and questioner. It is not the role of the interviewer to put forth his or her opinions, perspectives, or feelings.

Tips related to personal interaction and environment

- **Put the person at ease** through small-talk and connecting to them as a person before launching into the interview process.
- **Introduce yourself, describe the purpose of the interview, and explain how the data will be used** (e.g., for program improvement). Explain that you are interested in understanding the person's own viewpoint and experience.
- **Explain that any information from the interview will be kept confidential and anonymous.** Present the interviewee with the consent form that they must sign before being interviewed. (See section 4 for a sample consent form). If the interview is done by phone, consent forms may be mailed before *or* after as long as you obtain verbal consent. Be sure to ask for the interviewee's mailing address if you don't already have it.
- **Ask for permission to tape-record**, saying this frees you from having to take detailed notes. Whether they agree or not, they should sign the consent form for being interviewed. If the interviewee does not want to be recorded, continue the interview, but take detailed notes. The tape-recorder should be near person and unobstructed. To achieve a good quality tape recording try to:
 - avoid talking over people

- place the tape recorder an equal distance between the interviewer and respondent – sit as close to the respondent as is comfortable for both persons.
- if respondent has a thick accent or tends to mumble, try to repeat important points they make for clarification
- include a note to the transcriptionist that spells out any frequently used names, abbreviations, acronyms, or professional and technical terms.

Tips on asking questions within the interview

- **The interviewee should do most of the talking.** You want to get their ideas and perspectives, not expound on your own.
- **Be receptive to all responses.** Be aware of your own body language (frowns, smiles, laughter, gestures). Avoid showing surprise at answers and avoid negative or positive gestures or responses to student comments.
- See interviewing as a spiraling conversation. View the questioning process as a structured, but not linear, flowing conversation. **The written questions are a starting point only—use follow-up questions to focus and probe deeper.** Examples of follow-up probes: “Tell me more.” “Tell me why you feel that way.” “Why do you think that happened?” “Why was that important?” “Can you give me another example of what you mean?”
- **Paraphrase by repeating ideas using interviewee’s words (if possible) to check out what you hear.** Examples: “It seems like you are saying _____. Is that what you mean?” “When you described that event you used the word ‘frustrating.’ Tell me why you use that word?”
- **Avoid leading questions or giving your own opinion.** Try to remain neutral but friendly throughout the interview.

Figure 7: Which to use—Focus groups or Individual interviews?

Factors to consider	Use focus groups when. . .	Use individual interviews when. . .
Group Interaction	Interaction of respondents may stimulate a richer response or new and valuable thought.	Group interaction is likely to be limited or nonproductive.
Group/peer pressure	Group/peer pressure will be valuable in challenging the thinking of respondents and illuminating conflicting opinions.	Group/peer pressure would inhibit responses and cloud the meaning of results.
Sensitivity of subject matter	Subject matter is not so sensitive that respondents will temper responses or withhold information.	Subject matter is so sensitive that respondents would be unwilling to talk openly in a group.
Depth of individual responses	The topic is such that most respondents can say all that is relevant or all that they know in less than 10 minutes.	The topic is such that a greater depth of response per individuals is desirable, as with complex subject matter and very knowledgeable respondents.
Data collector fatigue	It is desirable to have one individual conduct the data collection; a few groups will not create fatigue or boredom for one person.	It is possible to use numerous individuals on the project; one interviewer would become fatigued or bored conducting all interviews.
Extent of issues to be covered	The volume of issues to cover is not extensive.	A greater volume of issues must be covered.
Continuity of information	A single subject area is being examined in depth and strings of behaviors are less relevant.	It is necessary to understand how attitudes and behaviors link together on an individual basis.
Experimentation with interview guide.	Enough is known to establish a meaningful topic guide.	It may be necessary to develop the interview guide by altering it after each of the initial interviews.
Observation by stakeholders	It is desirable for stakeholders to hear what participants have to say.	Stakeholders do not need to hear firsthand the opinions of participants.
Logistics Geographically	An acceptable number of target respondents can be assembled in one location	Respondents are dispersed or not easily assembled for other reasons.
Cost and Training	Quick turnarounds is critical, and funds are limited.	Quick turnaround is not critical, and budget will permit higher cost.
Availability of qualified staff	Focus group facilitators need to be able to control and manage groups.	Interviewers need to be supportive and skilled listeners.

Source: *User-friendly Handbook for Mixed Method Evaluations*, Directorate for Education and Human Resources, Division of Research, Evaluation and Communication, National Science Foundation. August 1997, p. 3-11.

Tips on how to analyze the interviews

Although interviews can provide a wealth of information, the analysis of interviews is challenging because responses are usually quite varied, interconnected, and complex, with issues often discussed in more than one place. Your task throughout the analysis is to **look for common and recurring ideas, issues, and themes across the set of interviews, as well as try to recognize the range of the perspectives that interviewees have.** When doing analysis, you must continually attempt to put aside your own perspective and be guided by what the interviewees said.

Whether or not you work alone or with others to conduct the analysis, and whether you work from verbatim transcriptions or written notes, the process of analysis is generally similar to that

described below:

1. If interviewers used notes, collect the notes together. If transcripts were completed, distribute these to the people who will complete the analysis. The aim in reading through either notes or transcripts is to **fully understand the perspective of the person who was interviewed and synthesize that information, highlighting major themes, patterns, and answers to key questions.**
2. Read through transcripts/notes for each interview and do the following: **Write a key word or phrase in the margin to capture the topic** (such as advising, labs) and also write a few words to summarize the perspective. Note both positive and negative factors. **Highlight or underline student comments or phrases when these provide a good example** of the perspective or provide a clear illustration of the interviewee's perspectives. If you have time after reading the interview, make a short summary of the issues and perspectives at the very end of the transcript. Re-read as needed.
3. An "**inductive**" analysis involves starting your analysis with no pre-conceived notions of what you will find, identifying common issues and themes, clustering these themes into categories, and organizing them into logical hierarchies. Alternatively, a "**deductive**" analysis involves using the questions on your interview protocol to structure your analysis. The inductive method emphasizes understanding the respondent's perspective and assessing what they thought was important; the deductive method emphasizes finding the answers to your protocol questions—what you thought was important—regardless of what else was discussed during the interview. The deductive method of analysis tends to be less time-consuming, but it is also more biased towards the evaluator's own perspectives on what is important. **Pick the method that is right for your needs.**
4. Depending on how you will be using the interview data, **you may want to clip and save particularly informative or cogent quotes** to be included in reports.

Section 3: ETHICAL CONSIDERATIONS

Interviewees and survey respondents are more likely to contribute their feedback openly and honestly if they can be assured that their responses will not harm or embarrass them in any way. This usually requires ensuring them that their responses will be kept confidential and that any reporting of the data will be done in such a way that maintains the anonymity of all respondents. Although it may not be required for you to contact your campus human subjects research committee for you to do an evaluation of your own program, you may still wish to provide a consent form for participants, especially for interviews, which are more personal and less anonymous than surveys. A sample consent form for a LEAD evaluation may be seen on the next page. You may want to use something similar, especially if your respondents are students. If your respondents are minors, parental permission forms will be required. For additional guidance on obtaining consent, you can contact your local human subjects research committee.

Consent Form for LEAD Interviews regarding NPACI's efforts in education

The University of Wisconsin-Madison's LEAD Center is conducting a formative evaluation of the National Partnership for Advanced Computational Infrastructure's efforts to connect the developers of high-performance computer tools with potential users in education. As part of this evaluation, we are interviewing educators, tool developers, and others involved with this effort. You have been asked to participate in one of these interviews. Your participation is completely voluntary, and all responses will be held confidential. The LEAD Center will generalize about responses so as to obscure the identity of particular individuals. The LEAD Center may publish papers based on the results of this evaluation, but these materials will contain no information that would identify particular individuals.

The audiotapes made during interviews will be available only to researchers employed by the LEAD Center, who will use them to obtain accurate accounts of the interviews. Tapes will be kept by the LEAD Center for seven years

Again, your participation is completely voluntary, and you are free to withdraw from the interview at any time with no consequences. There are no risks associated with participation.

Any questions you have you may ask now, or you may contact Julie Foertsch of the LEAD Center at (608) 265-6368 or foertsch@enr.wisc.edu.

I have read the above and give my consent to participate in the study.

Name (printed): _____

Signature _____ Date _____

(One copy for the participant and one for the researcher)

Step 8: Putting the evaluation data to use (Reporting findings summatively and utilizing them formatively)

In order for evaluation efforts to inform the process of program improvement or funding renewal, results from your evaluation activities will likely need to be made available to numerous program stakeholders. Findings can be presented in a variety of ways, although written reports are the most commonly-used format for disseminating evaluation findings. It is important for the evaluator to know the potential audiences of the report and to tailor the findings in a way that is accessible to each interested party.

Some guiding questions about reporting results

Before you begin writing up the results of your evaluation, you may want to revisit some of the planning work you have done. **The same questions you asked in planning the evaluation are the questions that will guide you in how to utilize and report its results.** In addition, you may want to step back from the evaluation and consider the big picture of what it reveals. Some important questions to revisit and new questions to ask include the following:

What were the original goals for conducting the evaluation?

Most programs conduct evaluations for the purpose of improving their program as well as meeting requirements for funders. It is important to keep these goals in mind while writing a report of the findings so that the data is presented in a way that is aligned with the purpose of the evaluation.

What issues/topics received many responses?

One of the ways an evaluator gains understanding of a phenomenon is by considering the quantity and nature of the comments relating to various dimensions of a program. In addition to noting the frequency with which participants address a topic, it is equally important that evaluators note the descriptions of topics and issues.

Who are the audiences that would be interested in evaluation results?

Different audiences will be interested in different aspects of the evaluation. Funders and university administrators may be interested in the broadest issues, such as whether the program was successful in meeting its overarching goals. Program administrators or potential adopters of the program may be interested in which particular elements of the program were the most effective in addressing the program's goals. Program participants may be interested in whether their opinions and concerns were appropriately represented.

How is the audience going to use the data?

In deciding how to report the results of an evaluation, it is important to consider how the findings will be used. If the results will be distributed to a funding source or potential program adopters, a detailed written description of the program's outcomes and essential elements may be required. In contrast, if a program director merely intends to present findings to stakeholders or colleagues at a conference, a summary of the findings on overhead slides would be more appropriate.

What are your resources to do reporting?

While it may be that a formal report would most benefit the audience, it may also be that the available resources are not adequate for such a task. It is important to budget adequate funding

and time for reporting evaluation results. A common pitfall of new evaluators is to leave inadequate time for writing and disseminating evaluation reports.

Who owns the product?

Clarifications about who owns the results of the evaluation should be made prior to the time results are being disseminated. It is best to decide at the outset of an evaluation who will have access to the results and whether some things will be kept confidential.

What do you do with "sensitive" information?

It may be the case that some of the results suggest dissatisfaction or difficulty with some aspect of a program. While reporting on "sensitive" or negative findings may be challenging, it can be done in a way that opens the door for improvement. Names and places should be made non-identifiable by using blank lines to fill the space, and other information that reveals identity should be eliminated. Comments that express dissatisfaction can be phrased in terms of "limitations" or "areas for improvement."

Key components in the report

Most evaluation reports contain the following parts:

Introduction

In many cases if there is not an abstract or executive summary, people interested in the results of a program evaluation will read only the introduction and the conclusion of a report. The primary purpose of an introduction is to set the stage for the remainder of the report by highlighting the purpose of the evaluation and the intended audiences for the findings. The introduction is also a place to clarify contextual issues surrounding the study and discuss its limitations. It also should provide a brief "reader's guide" to the report by listing what will be discussed in each section. Brief reviews of relevant literature can be very useful in helping to contextualize (and legitimize) your evaluation for an external audience.

Methods

This section is where methods of data collection are described. It includes brief descriptions of the types of instruments used, the types of questions asked, the procedure by which data was collected, the number of respondents and/or issues with responding, the response rate (# responding divided by the total number sent a survey), and the "representativeness" of the respondent sample with regards to the participant population (how demographically similar are the respondents and the total participant population?). In some cases (like for peer-reviewed journal articles), this section also provides a brief description of the analysis process.

Findings/Themes

This section is where the findings are described and analyzed and usually comprises the bulk of the report. The interpretation of the findings is as important as the presentation, and is perhaps the most sophisticated aspect of doing an evaluation. In writing a report on the findings, it is important that the writer provide a guide for the reader in terms of relating the findings to the questions. One effective way of organizing this section of an evaluation report is to write about the program's major outcomes first (how well it did in addressing its overarching goals) and then to provide details on what elements of the program were essential in producing these outcomes. Another way of organizing the report, especially if you have used only one evaluation tool and

the number of questions is not overly large, is to use the questions asked as an organizational guide.

Strive to report evaluation findings in as objective a manner as possible, recognizing your program's and evaluation's weaknesses as well as their strengths. This is ultimately the most useful and the most persuasive way to present data. Including a section towards the end on things that need to be improved will make for a more useful document.

Conclusion

This is the section where the evaluator can synthesize different findings from the evaluation. In summarizing the overarching findings, it is important to not introduce new material, but rather focus on what has been presented before. Depending on your situation, it may be appropriate to make recommendations based on this summary.

Appendices

This is the place to attach copies of surveys, interview protocols, and other reference materials that will help the reader to understand the questions asked and other relevant content.

Although reporting on your evaluation results will be essential in demonstrating a program's impact to stakeholders and sharing its best practices with national audiences, **the evaluation will not have achieved its full potential unless you use its results to improve your program!** Even the most effective and successful program can always be improved. By following the evaluation process outlined in this document, all EOT-PACI projects and teams will have the opportunity to refine their strategies, re-orient toward their supporting goals, and improve their likelihood of ultimate success.

Useful additional resources:

LEAD Center's website: <http://www.cae.wisc.edu/~lead/>: Access to LEAD's evaluation reports, complete with examples of evaluation designs, surveys, interview protocols, and how to report data.

Field-Tested Learning Assessment Guide (FLAG) website: <http://www.wcer.wisc.edu/nise/cl1/flag>: An on-line resource for college instructors to use in assessing the student learning that results from new teaching techniques or educational tools.

Stevens, F., Lawrenz, F., & Sharp, L. (1997). User-Friendly Handbook for Project Evaluation, NSF-EHR Publication, NSF 93-152: NSF's handy handbook for novice evaluators. This is the yellow booklet that we handed out at the EOT Evaluation Workshop in 1997. It may be ordered from NSF.

Rossi, P. H., & Freeman, H. E. (1993). Evaluation—A systematic approach (5th edition). Newbury, CA: Sage: More detailed, but still very straightforward.

Appendix A:

Some guiding goals from EOT-PACI: What your teams and projects should aim to achieve

1) National impact of EOT-PACI projects: PACI’s Education, Outreach and Training projects must be more than a loosely confederated collection of successful local projects. If a project is worthwhile, the project or the lessons learned from that project should be shared with others around the nation and have a visible path to national significance. Although some of our older projects are already at the point where they can be scaled-up or replicated at other sites, newer projects will have to consider how they can contribute to EOT-PACI’s national impact in the long term.

Questions: In the next several years, how does your project or group of projects intend to disseminate its activities or its knowledge beyond its current target site and target audience? How does the set of projects in your team work together to address nationally important issues and have an impact beyond the communities in which those projects began?

2) Systematic evaluation, dissemination, and scaling of projects: This goal supports the goal of national impact above. EOT-PACI projects should all make an effort to evaluate their progress toward the project’s own goals and toward EOT-PACI goals. They must then disseminate the lessons learned from their projects and make efforts to identify the elements of their projects that are critical to their success so that these projects can be scaled-up or replicated without loss of effectiveness. Evaluation can be done internally or by third-party professionals but should be used to both identify and contribute to a project’s successes. Learn what needs to be improved and then improve it.

Questions: What measures are being taken by each team and/or each project to evaluate its progress, identify successful practices, and disseminate or use what has been learned?

3) Collaboration and sharing of resources within teams: One goal of EOT-PACI is to make the progress towards our goals as efficient as possible by sharing resources and avoiding unnecessary overlap of activities. EOT-PACI projects are expected to collaborate with other projects within their teams whenever it is feasible to do so. Collaboration at its lowest levels is defined as having conversations, meetings, or working sessions with persons from other PACI projects or teams regarding how one or more projects or teams could work together, share information, or share resources. At its highest level, collaboration involves interconnecting two or more projects in order to better cover or serve participants’ needs, or the sharing of resources and/or staff between projects in order conserve resources and avoid redundancies.

Questions: How have the projects within your team collaborated in the past and how do they plan to collaborate in the future? What mechanisms are in place to allow your team’s members to share information and ideas with one another and work together to pursue common goals?

4) Leverage EOT efforts across PACI: PACI’s Education Outreach and Training projects are not a mere “afterthought” or promotional tool—they are central to achieving its mission. Every AT/ET/PACs team should be linked to EOT in a substantive way. Forging such partnerships will be dependent on the cooperation of the AT/ET/PACs teams, but EOT-PACI projects and team leaders may need to make the first move. Many AT/ET/PAC partners have no idea how to meet the needs of the teachers, students, government workers, underrepresented populations, and

other citizens that participate in EOT-PACI projects. We need to tell the tool developers what we need—and then collaborate with them on how to best meet those needs.

Questions: How can projects in your area form partnerships with tool developers from the AT/ET/PAC teams? What efforts will you make to let people on the AT/ET/PAC teams know what your target audiences' needs are? What could the EOT-PACI leadership do to assist you in forging partnerships?

5) Create strategic partnerships beyond PACI: In order for many EOT-PACI projects to succeed and to be sustained over the long term, more funding and strategic support is needed than PACI alone can provide. Creating partnerships with businesses, institutions, foundations, and government groups beyond PACI is essential to ensuring our projects long-term health and increasing the range of their impact. Projects must link with other funding sources and other influential groups in order to expand, and they must be prepared to be self-sustaining once PACI funding is discontinued.

Questions: How are your team's projects attempting to link with non-PACI groups and what are the strategic reasons for doing so? What are your team's projects doing to secure additional funding or to support related efforts made by non-PACI groups? Which of your projects are currently supported by other funding?

6) Increasing diversity within EOT-PACI and its target audiences: In order for EOT-PACI projects to be truly successful in having a positive impact on as broad and diverse a population as possible, it is essential that EOT-PACI projects be proactive in recruiting from populations that are underrepresented in math, science, the computational sciences, and technology. Both the EOT-PACI partnership and the target audiences which its projects serve should, in the long term, reflect the racial, cultural, and gender diversity of the nation we are attempting to impact. We want people of all backgrounds to have a voice in PACI and how high performance computers will ultimately be used in society.

Questions: How are the projects in your area making an effort to include women and underrepresented ethnic minorities in both the populations they serve and the administration and staffing of the project? If women and minorities are statistically underrepresented in your target audiences or your staff, what is your plan for increasing the diversity of these groups? Do you have partners or collaborative institutions that have a high participation of underrepresented groups?

7) Universal Design and Disability Access reflected in all technologies and projects: Reaching as broad an audience as possible and being inclusive in our efforts means that the needs of the disabled cannot be ignored. PACI tools and EOT-PACI projects must take the needs of the disabled into account and ensure that disabilities will not prevent people from participating in our projects.

Questions: Can people with disabilities participate in the projects in your area? If not, what efforts are you taking to make these projects more accessible to the disabled?

Appendix B: Sample program survey from the evaluation of the Education Center for Computational Science and Engineering

Annual Survey of SDSU Faculty's Current Information Technology Needs and Practices

Fall, 1999

Conducted annually by the Education Center for Computational Science and Engineering for the Dean's Office. Your participation is critical to the College obtaining an accurate assessment of your current needs.

Please use the Reply function on your e-mail system to mail back a completed survey. This survey should take less than 10 minutes to complete. To respond to the questions, type in the correct response or place an X in front of the best answer unless otherwise instructed. Your responses will be kept confidential and anonymous by the researchers conducting this survey and will be used only as part of a compilation to help the SDSU administration and technical support services better meet your college's and department's technological needs. We appreciate your help in assessing these needs accurately.

****Please return this survey by September 10!!****

(1) What is your gender?

- (a) Male
 (b) Female

(2) In which College are you appointed?

- (a) Arts and Letters
 (b) Business Administration
 (c) Education
 (d) Engineering
 (e) Health and Human Services
 (f) Professional Studies and Fine Arts
 (g) Sciences

(3) In which Academic Department are you appointed?:

(4) How many years have you been teaching at the university level?:

(5) Do you have tenure?

- (a) Yes
 (b) No

(6) How frequently do you use each of the following computer applications?

Use this scale to indicate the approximate frequency:

0=never;

1=a few times a year;

2=monthly;

3=weekly;

4=daily;

- (a) E-mail, such as Eudora
 (b) Electronic presentation programs, such as PowerPoint

- (c) The Internet or World Wide Web
- (d) Electronic indexes (like ERIC, Dissertation Abstracts, etc.) that are stored on CD-ROMs or on the Internet
- (e) Interactive models or data visualization applications available over the Internet
- (f) “Digital libraries” (containing large datasets that may be used by anyone) on the Internet

(7) What is your approximate level of skill for each the following computer-related activities? Use this scale:

- 0=I have never tried this
- 1=I have only the most basic skills
- 2=I am fairly skilled
- 3=I am highly skilled

- (a) Finding materials and information on the Internet
- (b) Using interactive models or data visualization programs on the Internet
- (c) Creating electronic presentations using programs like PowerPoint
- (d) Creating Web pages or other materials for the Internet
- (e) Creating or adapting interactive computer materials for use in instruction

(8) How much more skill would you *like to have* in these areas? Use this scale to rate how interested you would be in increasing your skills:

- 1=I am not interested in gaining more skills
- 2=I would like to add to my skills in some areas
- 3=I would like to be much more skilled

- (a) Finding materials and information on the Internet
- (b) Using interactive models or data visualization programs on the Internet
- (c) Creating electronic presentations using programs like PowerPoint
- (d) Creating Web pages or other materials for the Internet
- (e) Creating or adapting interactive computer materials for use in instruction

(9) How many undergraduate courses do you typically teach?:

(10) Have you ever created a World Wide Web page for your courses?

- (a) Yes
- (b) No

(11) While teaching at SDSU, how often have you used a “smart classroom” (equipped with a computer presentation system) or brought a computer to your classroom to present information to your students?

- (a) Never (skip Q11b)
- (b) Rarely
- (c) Sometimes

___(d) Often

(11b) How many of these computer presentations involved use of the Internet?

___(a) None of them

___(b) Some of them

___(c) Most of them

___(d) All of them

(12) While teaching at SDSU, how often have you had your students use computers in the classroom, “hands-on,” as part of the regular in-class curriculum?

___(a) Never

___(b) Rarely

___(c) Sometimes

___(d) Often

(13) In a typical course in the last year, how often have you required your students to engage in the following computer-related activities? Use this scale to rate the frequency:

0=Never;

1=Rarely;

2=Sometimes;

3=Often;

___(a) Obtain course materials/information from my course Webpage

___(b) Retrieve information from the Internet for class assignments

___(c) Interact with classmates about class assignments via a computer

___(d) Use interactive computer models or demonstrations to learn a concept

___(e) Use computers to analyze and/or visualize data

___(f) Learn how to program computers

___(g) Use a high performance workstation or supercomputer

(14) What degree of *interest* do you have in using computers in instruction?

___(a) I am completely opposed to it

___(b) Absolutely no interest, though I am not opposed to it in principle

___(c) A small degree of interest

___(d) A fair degree of interest

___(e) A great degree of interest

(15) What do you feel is the *greatest obstacle* to you using computers in the instruction of your students?

(16) What would you see as the *greatest benefit,* if any, to using computers in the instruction of your students?

(17) Do you see yourself as having any use for high-performance computation, modeling, or visualization programs in your courses?

___(a) Yes

___(b) No

(c) I am unsure

If *Yes*, for what purpose?:

(18) How familiar are you with the San Diego Supercomputer Center?

- (a) I'd never heard of it before now
- (b) I'd heard of it before now but know little or nothing about it
- (c) I have a basic knowledge about it and its purpose
- (d) I am very familiar with the Supercomputer Center and its purpose

(19) How familiar are you with the Education Center for Computational Science and Engineering on the SDSU Campus?

- (a) I'd never heard of it before now
- (b) I'd heard of it before now but know little or nothing about it
- (c) I have a basic knowledge about it and its purpose
- (d) I am very familiar with the Education Center and its purpose

(20) How did you become informed about the Education Center? Check all that apply:

- (a) I have no information about it
- (b) Through on-campus fliers or announcements
- (c) Through newspaper or magazine articles about the Center
- (d) Through the College Dean or my department chair
- (e) Through colleagues on campus who have used or considered using it
- (f) Through personal contacts with Center staff
- (g) Through faculty presentations or workshops given by Center staff
- (h) Through participation in the Center's "NPACI hours"
- (i) Through the Center's Faculty Fellows program
- (j) Through the Center's Website
- (k) I have inquired about the services the Center provides
- (l) I have worked or consulted with Center staff regarding my courses

(21) How useful do you see the Education Center as being in regards to your own needs and plans as an instructor?

- (a) I do not know enough to answer
- (b) Not very useful
- (c) Somewhat useful
- (d) Very useful

Appendix C: Sample course evaluation questions for courses using HPC technology

Courtesy of the LEAD Center,
University of Wisconsin-Madison

Below is a list of sample survey questions that one might use to evaluate course impact and learning gains in a course that incorporates HPC technology. The list includes questions about student background, the impact the course had on students' interest and confidence in certain skills, and the effectiveness of various elements of the course in promoting student learning and engagement. These questions are meant as examples of the types of questions an instructor might want to ask. Course instructors should choose only those questions that are relevant to the activities in their course and modify the wording or add questions as needed. Additional suggestions for survey questions and how to analyze them may be found at the website for the Field-tested Learning Assessment Guide (FLAG) at <http://newtraditions.chem.wisc.edu/FLAG>.

When using a survey to evaluate the impact of your course, it is best to administer one survey at the very beginning of the semester (within the first week of classes starting) and a second survey in the last week of classes. The more students who fill out a survey, the better, so it often helps to make the survey part of a required homework assignment. An alternative, if you are willing to take up the class time, is to have students fill out the surveys in class.

These surveys can be anonymous (and in some cases students may be more honest if their identities are concealed), but anonymity comes at a price: To get the most out of your survey analyses, you will want to match the baseline data from the first survey with the outcome data from the last survey for each student, in which case you will need a student ID# or other consistent identifier on both the first and last survey. If you can figure out a way to assign a random ID# that preserves each student's anonymity, feel free to try, but students must remember the number they are assigned and use it on both the first and last survey. An alternative is to administer just one anonymous survey at the end of the semester (as is done with standard course evaluations), but this will not allow you to see how individual students' attitudes, confidence, and opinions have changed over the semester, an important measure of course impact.

The questions below are grouped as follows:

- Background questions, which need only be asked on the first survey;
- Measures of interest, measures of confidence, opinions about group work, and feelings about computer technology, all of which should ideally be asked on both the first and last survey;
- Evaluations of the course and its elements and their impact on learning, which should be asked on only the last survey.

Once you have selected the questions you wish to use, replace the 0) in front of each question with a consecutive number to facilitate data analysis.

Background questions:

0) **Gender:** ___ female ___ male

0) **U.S. ethnic code:**

 ___ White (Non Hispanic)

- Cambodian, Laotian, or Vietnamese whose family immigrated after 1975
- Other Asian or Pacific Islander
- American Indian or Alaskan Native
- Hispanic/Latin American
- Black/African-American

0) College rank:

freshman sophomore junior senior special graduate

0) Intended major: _____

0) Which of the following science courses have you completed in high school or college (check all that apply):

biology chemistry physics

0) Which of the following math courses have you completed in high school or college (check all that apply):

basic math algebra geometry pre-calculus/trigonometry calculus

0) How many hours per week will you be working at a paid job this semester?

none 1-5 6-10 11-15 16-20 21-30 31-40

0) Do you expect to have child care responsibilities this semester that will sometimes conflict with classes?

yes no

Measures of interest in subject area (e.g., physics) and course activities (e.g., using the Internet):

Please circle the number that indicates your current interest level in the areas below:

interest level

Interest in...		low					high
understanding the principles of physics	10)	0	1	2	3	4	5
being able to understand advances in science	10)	0	1	2	3	4	5
pursuing a career that requires an understanding of science	10)	0	1	2	3	4	5
using the Internet as a learning tool	10)	0	1	2	3	4	5
working in groups to complete class assignments	10)	0	1	2	3	4	5
using a computer to analyze data and understand mathematical relationships	10)	0	1	2	3	4	5

Measures of confidence in abilities required by the class:

Please circle the number that represents your current confidence level in the areas below
 confidence level

Confidence in your ability to...		low					high
understand [physics concepts]	20)	0	1	2	3	4	5
write about [physics concepts]	20)	0	1	2	3	4	5
explain [physics concepts] by drawing diagrams	20)	0	1	2	3	4	5
solve problems using formulas	20)	0	1	2	3	4	5
succeed in a university [physics/science] course	20)	0	1	2	3	4	5
use the Internet to retrieve information	20)	0	1	2	3	4	5
understand concepts through use of a computer model	20)	0	1	2	3	4	5

Opinions about group work:

Please circle the number that represents your degree of agreement with these statements.

Opinions about working in groups		strongly disagree					strongly agree
Working in groups has benefits over working individually.	30)	0	1	2	3	4	5
I can learn more by working with others than I can by working alone.	30)	0	1	2	3	4	5
Working in groups is often frustrating.	30)	0	1	2	3	4	5
Some people in a group always end up doing all the work, while others hardly do anything.	30)	0	1	2	3	4	5
On science homework, I prefer working in groups over working individually.	30)	0	1	2	3	4	5

Feelings about computer technology:

Please circle the number that represents your degree of agreement with these statements

Opinions about computers		strongly disagree					strongly agree
Computer programs and models are useful in helping students to understand course concepts.	40)	0	1	2	3	4	5
Teachers should make greater use of computers and computer models in the instruction of their students.	40)	0	1	2	3	4	5
Working on computers is often frustrating.	40)	0	1	2	3	4	5
The jobs I have in the future will require me to use a computer.	40)	0	1	2	3	4	5

I would enjoy having a job or career that required extensive use of a computer.	40)	0	1	2	3	4	5
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Evaluations of the course:

0a) The [computer models/illustrations] that we used in this course had the following effect on my learning:

- they made it harder for me to learn
- they had no effect on my learning
- they made it somewhat easier for me to learn
- they made it much easier for me to learn

b) Please describe why you think this:

What impact did each of the following aspects of the class have on your learning?		it hurt	was of no help	helped a little	helped quite a bit	helped a great deal
reading the text	40)	0	1	2	3	4
doing the computer homework exercises	40)	0	1	2	3	4
working with the computer visualizations in class	40)	0	1	2	3	4
retrieving research materials from the Internet	40)	0	1	2	3	4
participating in class discussions	40)	0	1	2	3	4
writing lab reports	40)	0	1	2	3	4
giving class presentations	40)	0	1	2	3	4
working on the final project	40)	0	1	2	3	4

0) How often did you have problems [accessing the course Web page/getting the visualization program to work/understanding how to run the modeling program]?

- I never had problems
- I had problems early on, but these were resolved
- I had some problems throughout the semester
- I had lots of problems throughout the semester
- I had so many problems that I gave up and got my information another way

0a) When you started this semester, did you expect working in groups to help you?

- yes no

b) Did working in groups help you?

yes no sometimes

c) Why?

0) Compared to other courses you have taken at SDSU, how challenging was this course?

- much more challenging
- somewhat more challenging
- about the same
- somewhat less challenging
- much less challenging

0) Compared to other courses you have taken at SDSU, how interesting was this course?

- much more interesting
- somewhat more interesting
- about the same
- somewhat less interesting
- much less interesting

0) Compared to other courses you have taken at SDSU, how much did you learn in this course?

- much more
- somewhat more
- about the same
- somewhat less
- much less

0) Compared to other courses at SDSU, how much control did you have over the pace at which you learned the material?

- much more
- somewhat more
- about the same
- somewhat less
- much less

0) Compared to other courses at SDSU, how much self-discipline did this course require?

- much more
- somewhat more
- about the same
- somewhat less
- much less

0) I think that the concepts I learned from this course will be useful to me later on.

- strongly agree
- somewhat agree
- somewhat disagree
- strongly disagree

0) The professor did a good job of helping us to understand how to use the computer for this course.

- strongly agree
- somewhat agree
- somewhat disagree
- strongly disagree

0) It was clear to me why the [computer exercises] were used in this course.

- strongly agree
- somewhat agree
- somewhat disagree
- strongly disagree

0) I think there are better ways of teaching the material than the [computer exercises] we used in this course.

- strongly agree
- somewhat agree
- somewhat disagree
- strongly disagree

0) What did you like most about this course?

0) What did you like least about this course?

Appendix D: Example interview protocol from the GirlTECH/MCSA program evaluation

Background

1. How long have you been teaching?
2. What grade and subject(s) do you teach?
3. Before attending the GirlTECH workshop, what had been your approach to teaching that subject? What were your typical class periods like?
 - a) Had you ever used group work?
 - b) Had you ever had your students work on projects?
 - c) How much class time was typically spent lecturing or doing chalkboard demonstrations?
 - d) ...doing hands-on demonstrations?
 - e) ...doing problems sets and exercises?
 - f) ...doing group work?
4. Before you took the MCSA/GirlTECH workshop, how much computer access did you have at your school? [Where were computers located? Were they connected to the Internet?]
5. How often did you use computers in your teaching? If you did use them, what types of activities did you do?
6. How often did you use the computer on your own and for what purposes? How adept did you feel at using the computer?
7. Describe the students in your typical class in terms of gender, class, ethnicity.
8. Before the MCSA/GirlTECH workshop, how often did you discuss career opportunities with your students? In what contexts?

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1. What motivated you to attend the MCSA/GirlTECH workshop? What were you hoping to get out of it?
2. What support or encouragement did you have from your school to attend this workshop? Did you attend the workshop with other teachers from your school, your district?
3. Please describe your experiences in the workshop. What did you think of the workshop?
 - a) Describe the computer/Internet training. What did you think of that? Was it at the right level and pace for your level of expertise? Was there sufficient technical support?
 - b) Describe the talks by industry people. What did you think of them? What did you see the purpose of those as being?
 - c) Describe the talks by college students in the Summer with a Scientist program? What did you think of them? What did you see the purpose of those as being?

- d) Describe the discussions with Dr. Tapia. What did you think of them? Do you think it is important to have someone like Dr. Tapia interact with the participants in this program? Why?
4. What did you find most valuable about the workshop?
5. Is there anything about the workshop that you would like to change or did not particularly like? Were there any other topics/activities that you wish had been included in the program?
6. Were your expectations for the workshop fulfilled? In what way? Was there anything in the program that prevented your expectations from being fulfilled?
7. To what degree did you interact with other teachers in the workshop?
 - a) What did you get out of those interactions?
 - b) Do you still interact with them?
8. Do you use the email list? Why or why not? How often do you use it?
9. Have you received technical or other support from the CRPC at Rice University following the workshop?

Workshop impacts

1. [If not covered] One goal of the workshop was to make teachers aware of the opportunities that exist in the computational sciences, with particular emphasis on what it takes to succeed in these fields for minorities. In your mind, was the goal achieved? What elements contributed to that?
2. Has the workshop affected you or what you do? How would you characterize the impact of the workshop?
3. Have you done anything differently in your classroom or in your interactions with students as a result of the workshop? Can you give me an example?
4. If you have tried new things in the classroom, how have they gone?
 - a) Did things go as you expected?
 - b) Have you had problems or constraints that have limited what you had intended to do with your GirlTECH training? Were you or will you be able to overcome those problems?
5. Have you done anything differently in your interactions with other teachers and/or school administrators? Have you taken on any new roles, official or unofficial, since you've been in the program?
6. What role did the CRPC play in what you've been able to accomplish after the program? [Does the reputation of the CRPC give you leverage of some sort?]