EvaluATE has had a lot going on lately that you should know about!

Whew—the annual survey has just closed. Thanks once again for your hard work collecting and compiling the necessary information. As you know, findings from the survey are used in part to justify ATE’s funding before Congress.

In this year’s survey administration, we heard from 226 grantees, achieving a 94% response rate. Well done! Thank you so much.

Arlen Gullickson, who has been our PI, is switching center leadership roles with Lori Wingate. Dr. Wingate will now serve as EvaluATE’s PI. Dr. Gullickson will move to our co-PI position. If you are already in communication with our team, things should continue just as they have been lately. If you are interested in making a new contact with us, please do so through Lori at lori.wingate@wmich.edu.

Conduit editor: Stephanie Evergreen

Instrument Development

It is important that the instruments used by evaluators are valid—that is, they measure what they are designed to measure. One way to improve the validity of a questionnaire is to carefully follow these recommended steps that can provide evidence of an instrument’s content validity.

Step 1. Identify the object that is to be measured.
In our study, we wanted to measure sustainability of the impacts of ATE grants.

Step 2. Define the elements of the object (sometimes called the domain of content).
We began by asking ourselves What factors are involved in sustainability? Many avenues can be taken to answer that question. We perused literature related to sustainability. We also surveyed ATE grantees, by placing a question on the annual survey, and analyzed their answers for common phrases. We created a long list, including elements like faculty, collaborations, and students.

Step 3. Develop measures for each element.
From our long list of elements, we created a questionnaire. Items for the questionnaire were actually developed by ATE PIs in a process called Peer-Generated Likert Scaling. This process used the same survey responses we collected above and asked respondents to rate their agreement to the statements on a scale of 1-5. We first reviewed the items to remove duplicates and check for clarity. Then we asked three experts and three ATE PIs to examine the questionnaire, provide feedback, and recommend changes. At each step we whittled the number of items.

As the final step, we asked three different ATE PIs to complete the questions from their perspective as potential respondents. We also engaged them in multiple follow-up interviews to understand how they interpreted each question. We refined some questions and eliminated others as a result.

Finally comfortable with its content validity, we were able to use the instrument with the actual research population.

To learn about Peer-Generated Likert Scaling and/or grant sustainability, check out the full report on resources evalu-ate.org by searching sustainability. For one source on questionnaire development, see the 1983 book Educational research: An introduction written by Borg and Gall. EvaluATE is also hosting a webinar on this topic in May. Check out the back page for more details.
Developing, testing, and validating a new data collection instrument can be costly, but using a poor one bears its own costs. An option is to use an existing one. If you go this route, be sure to pilot test the instrument you select with your intended audience to make sure it will work in your context.

In a recent EvaluATE webinar, a participant asked if there was a repository of instruments used in NSF-funded projects. As far as my fellow presenters and I were aware, there is no single comprehensive source, but there are a few collections. One is the Online Evaluation Resource Library (oerl.sri.com). This site includes evaluation plans, reports, and instruments from various NSF programs. The instruments are organized by type of project and whether they are for use with faculty or students. Some might require modification. Whether adopting, adapting, or developing instruments, be sure to pilot-test them with your intended audience.

Another source for instruments used in NSF projects is the Math and Science Partnership Network (hub.mspnet.org). The site isn’t set up to facilitate searches for instruments, so you have to do a bit of digging, but the payoff may be worth your while. For example, in the Library section, I searched on “instrument” and located a document on “Measuring Student Engagement in Upper Elementary through High School: A Description of 21 Instruments.” The 88-page report includes detailed reliability and validity information about each instrument.

Route 21 (p21.org/route21) has links to various assessment instruments and services for evaluating students’ soft skills. Some are free, some very expensive. I searched to locate assessment rubrics—among the results was one for evaluating a robotics program. It was designed to assess participating teams’ collaboration, communication, and innovation. I found other rubrics for evaluating students’ communication, self-direction, and critical thinking. This search also led me to Rubistar (rubistar.4teachers.org), a resource for locating and creating rubrics for project-based learning activities.

If you’re looking for documentation on the validity and reliability properties of instruments, search academic journals in your content area. Although journal articles don’t typically include full instruments, authors will often provide them upon request. Virginia Tech’s Digital Library Archives (scholar.lib.vt.edu/ejournals) includes several journals focused on technology education, many of which may be accessed without a subscription. I searched on the phrase “evaluation instrument.” One result, from the Journal of Industrial Teacher Education, described the use of the Principles of Adult Learning Scale to investigate the effect of learning styles on the acquisition of basic skills in a two-year college setting. The authors obtained permission to use PALS from its developer and they shared the instrument’s validity, reliability, and norms data.

Although there isn’t one-stop shopping when it comes to data collection instruments, there are several promising places to start your search. Contact us if you know of a good resource or instrument that would benefit your ATE colleagues.

— Lori Wingate
In the Winter 2011 Conduit, I described how guiding principles can help you make good choices about the kind of activities in which your project/center engages. Once those choices are made, getting a new activity up and running takes a significant amount of time and effort. Part of that time and effort for the staff at the four centers I studied included incorporating evaluation. The staff members had found (often through trial and error) that taking time to consider the evaluative task and set up the data collection systems early meant less work later. Once the tools and systems for data collection were in place, staff could use the information gathered throughout the project for improving their efforts and demonstrating their success.

The centers’ early evaluation conversations included defining success; determining what information would be needed to assess progress toward success; articulating possible evaluation questions; and setting up data collection instruments, systems and strategies to get the information. A project map, like Helen Sullivan from CTC shared above, is a great tool to assist with this development process. Mapping activities, responsibilities, timelines, and deliverables in one document gives you a single file that summarizes important information, enabling you to track progress, setbacks, and next steps.

Involving your staff, partners, and evaluators in creating (and/or updating) the project plan generates a shared map about the purpose and process of your work and the evidence you need to collect for yourselves and your funders. As a small or large group, you can have a conversation about when that evidence is likely to show up, what kind of tools you’ll need to capture the information, and who is responsible for collecting it.

Even if only your staff or leadership team develops the project map and a blank template can be found at resources.evalu-ate.org, search project mapping.

### Goal 2: Professional Development for Educators

<table>
<thead>
<tr>
<th>Objective A: Develop opportunities for educator professional development.</th>
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<tbody>
<tr>
<td>Activity</td>
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<tr>
<td>5. Provide externships for faculty working in the convergence space to update their technical knowledge.</td>
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We use Excel to create our project plan, with a separate spreadsheet for each goal. An excerpt from our 2009 project map appears below. First, we explicitly state Goal 2 and Objective A. Then each activity gets a row on the map, starting with a description (Activity); the people working on it, with the leader’s name underlined (Prime); specific deliverable(s) and what constitutes evidence of success (Deliverables/Evidence); when to expect and gather evidence and deliverables (Timeline); insights and information to discuss at project review meetings (Comments/Suggestions); and a record of progress by quarter (Status). This full project map and a blank template can be found at resources.evalu-ate.org, search project mapping.

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Developing & Validating Survey Instruments

Wednesday May 18 | 1-2:30 PM ET

You know your project’s goals. And you know you need to measure your progress toward reaching them. You probably even know whether a survey questionnaire would help you measure that progress.

But what sort of questions belong on a survey instrument? How should they be worded? And how do you know you are asking the right questions?

This webinar will explain the questionnaire development process, using ATE examples. Along with the EvaluATE team, Candiya Mann will showcase her work with the MATE Center. We’ll feature Wayne Welch as a discussant, sharing his process of establishing content validity with a method that is practical for most ATE projects and centers. Both examples emphasize the importance of thinking from a measurement perspective to get more trustworthy data.

Strong Evaluation Plan = Stronger Proposals

Wednesday July 20 | 1-2:30 PM ET

By July, we will be just a couple of short months away from the due date for the next round of ATE proposals.

Join us as we review the elements of an ATE proposal’s evaluation component and how to use it to strengthen your submission. We’ll discuss how to tie evaluation tasks to the grant’s goals and objectives and how to be sure the evaluation is responsive to NSF’s expectations for ATE projects and centers.

Wondering how to incorporate evaluation into your budget? Need advice on how you can convey that you’ll use evaluation for project improvement? This webinar will help you integrate evaluation into your project work and clearly discuss the project-evaluation relationship in your proposal.

Register at www.eval-u-ate.org/events