Evaluating an ATE project is an ongoing challenge for the quantitative analyst. Access to data is uneven, numbers are small, and study contexts are constantly changing. Yet we want to produce rigorous analyses that yield solid conclusions and usable findings. The gold standard of evidence is hard statistical analysis—its Holy Grail is statistical significance, which gives a study’s findings instant credibility.

Yet statistical significance actually tells you very little about the importance of your findings. It gives you one piece of information: the likelihood that your result would occur purely by chance. So if you compare two groups of students and find that their test scores are two points apart, the generally accepted significance level of .05 means there’s only a five percent chance that this difference is purely random. Congratulations! You’ve achieved statistical significance. But this change is rather, well, insignificant.

Most ATE evaluations wouldn’t achieve statistical significance in any case, due to small participant numbers. More importantly, ATE evaluation studies almost never need statistical significance. Significance testing belongs to the inferential branch of statistics, so called because its tools are concerned with inferring information about a population based on results from a random sample of it. To conclude, for example, that the two-point difference is a characteristic not just of your sample but all the students it represents, statistical significance matters a lot. But most ATE evaluations don’t need to prove that they are adequately describing their population, for the simple reason that they nearly always study the entire population.

What tools do you reach for, then, to show that evaluation results are rigorous and reliable? Increasingly, applied statisticians are turning to the concept of practical significance, using some of the simple but elegant descriptive statistics:

- **Crosstabulation.** One of the simplest and most powerful tools in the descriptive toolbox, the crosstab helps you disaggregate your data to see the findings within it. That two-point difference may widen considerably when the individual results are compared on the basis of characteristics such as gender, age, or educational background.

- **Effect sizes.** An increasingly valued tool in the field of applied statistics, effect sizes are simply a way of expressing the degree of impact that the ATE project achieved. It could be a normalized difference in test scores, survey results, or other data points; the exact form depends on the type of impact and how it is measured.

For more information on descriptive statistics:

- My Environmental Education Evaluation Resource Assistant [meera.snre.umich.edu/plan-on-evaluation](http://meera.snre.umich.edu/plan-on-evaluation) (See Step 6)
- Research Methods Knowledge Base [www.socialresearchmethods.net/kb/statdesc.php](http://www.socialresearchmethods.net/kb/statdesc.php)

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For a refresher on the role of evaluation in your ATE grant (including all the different places you’re expected to report on your grant) and tips on how to work with an evaluator and what you should expect from him or her, check out the materials from our November 17 webinar on Getting Started with your ATE Evaluation. You can view the entire recorded webinar, just the slides, or the handout with references.
At the ATE PI conference in October, an attendee asked Lori Wingate, EvaluATE’s co-principal investigator, “What does NSF do with our evaluation reports?” Her response focused on the importance of project-level evaluation reports being useful to and meeting the needs of project-level stakeholders, and she pledged to find out more about how NSF program officers use evaluative information received from projects. ATE Program Director Gerhard Salinger kindly offered these insights:

Program officers use project evaluation reports to determine that the project is making good progress, that project leadership is obtaining data on the effectiveness and impact of the project, and that the project is moving towards obtaining useful information about project activities and/or products. A helpful and informative report states the goals and objectives of the project and describes the progress towards them. Program officers can then use these reports to address issues raised by the evaluator’s report. Including evaluation instruments is not necessary. The summary evaluation must be part of the final project report. Reports should be succinct and cover the issues; there is not time to read carefully 100-page reports.

Very often evaluations are about what the project does, e.g., “Five workshops were held on the following topics....” The participation is provided in a table including the number of participants along with demographic information. Generally with this type of information, the program officer would ask the PI to provide more information about the activities, what the participants learned from their involvement in the workshops, what they implemented in their classes as a result of the workshops, and how the information or activity is being institutionalized in the participants’ home institutions. Ultimately the ATE program would like to receive information about the number of students impacted and how their learning increased.

I have been encouraging PIs to make a few claims about the effectiveness of their projects. The evaluator should ensure that the claims are consistent with the project goals and are stated in terms that can be measured. The evaluator then provides the evidence for the extent to which the claims are justified. This process provides information about the effectiveness of the project and allows the PI and the program officer to step back from the details of the project and think about its overall contribution to the ATE program. This information can be used to inform evaluation of the ATE program by a Committee of Visitors or a third-party evaluator.

There is increasing pressure to do program evaluation at the federal level – to document and assess the ATE program’s effectiveness in meeting its goals. The federal government requires the program to report information about its performance in the form of program metrics. The annual ATE survey provides numbers and some measure of effectiveness, but more information about the effectiveness and impact of projects is useful.
FEATURED resource
Technical Education Curriculum Assessment (TECA) Rubric

If your ATE project includes a materials development component, the TECA rubric is a great tool to use with expert reviewers for either the formative or summative assessment of your educational materials.

Louise Yarnall of SRI International, in her presentation in the Research on Technician Education session at the ATE PI conference in October, referred to the TECA instrument. TECA is short for Technical Education Curriculum Assessment. The rubric was developed in 2005 as part of The Evaluation Center’s evaluation of the ATE program. Authored by Jonathan Keiser, Frances Lawrenz, and Jim Appleton, the rubric includes separate sections to be completed by industry or content-area specialists; curriculum, instruction, or assessment specialists; as well as a section to be completed by all reviewers.

To access the TECA rubric and supporting materials, go to evalu-ate.org/resources and enter keyword “TECA”

Industry and content-area experts rate materials in terms of their relevance to workplace practices, the extent to which they require students to demonstrate knowledge and skills associated with industry standards, their inclusion of realistic use of technology, the rigor of the content, and differentiation between low- and high-quality performance. Curriculum, instruction, and assessment experts answer questions about instructional strategies, problem solving, integration of general education content, soft skills, assessment, and diversity. Both types of reviewers answer items about alignment with industry standards and practices, real-world curriculum, workplace competencies, and access to in-depth understanding.

The rubric was developed and tested on materials from 37 ATE projects and with participation by 18 reviewers—industry, curriculum, and teaching experts.

Mainstreaming Evaluation in ATE

In this and future issues of Conduit, Amy Gullickson shares some lessons learned from her dissertation on evaluation use at four ATE centers.

One of the many ways evaluation can serve ATE projects and centers is at the organizational level, helping leaders and staff make decisions about overall strategy and which activities to undertake. This evaluative process begins with articulating criteria of merit, i.e., defining what’s important. In this context, “what’s important” means articulating why the organization exists. What is its purpose? What makes it unique?

For ATE centers and projects, the answer to those questions may be found in the mission and goals presented in their funding proposals. However, those statements may be too vague or general to be of use in decision making. To clarify their mission for the purpose of decision making, staff from one center created a set of seven questions they call “Guiding Principles.” When considering a new direction or activity they ask themselves the following:

Does this improve the technical and instructional skills of our faculty?

Does this complement and enhance our ability to improve student success by providing resources, opportunities, and access to educational programs?

Does this enhance our capacity and sustainability as a resource for innovative, creative, and valued products and services for our student, industry, and educational customers?

These questions clarify whether an activity fits within the center’s articulated purpose or not, helping the leaders make choices about resource investment and giving them a way to make the reasons for their choices more transparent to their partners.
Making Sense of Your Evaluation Data  
Wednesday, January 19 | 1-2:30 PM ET

Sometimes what seemed crystal-clear when the evaluation of your grant was being planned gets a little fuzzy once the data are actually in. Whether you have some evaluation data in hand or are still in the planning stage, this webinar will help you figure out what do with it. We’ll address how to select and apply analytic procedures, how to interpret the results, and what to do next.

Presented in four parts, the webinar will feature EvaluATE’s Stephanie Evergreen (qualitative analysis and triangulation), ATE Evaluator Sarah Butzen (quantitative analysis), and Kurt Wilson from Compass Outreach Media (website analytics).

Claims + Evidence: Assessing the Impact of Your ATE Grant  
Wednesday, March 16 | 1-2:30 PM ET

The ATE program solicitation says PIs “should establish claims as to the project's effectiveness, and the evaluative activities should provide evidence on the extent to which the claims are realized.” This webinar will walk ATE evaluators and PIs through a five-step process, which includes:
1. identifying claims worthy of evaluative investigation
2. framing impact evaluation questions around those claims
3. defining how to measure impact in meaningful, yet practical ways
4. determining how to make the case that the ATE project caused the impact
5. setting up performance standards to aid in interpreting evaluation results

Join us for guidance about how to move your evaluation beyond body counts, self-assessment, and satisfaction to genuine evaluation of impact and effectiveness.

To register for a webinar, go to evalu-ate.org/events

All EvaluATE webinars are hosted by our friends at MATEC | www.matecnetworks.org