

## INDICATORS OF THE SUSTAINABILITY OF NSF'S ADVANCED TECHNOLOGICAL EDUCATION PROGRAM

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### Introduction and Procedures

The National Science Foundation (NSF) has made several targeted research grants to study various aspects of the Advanced Technological Education (ATE) program. This Briefing Paper presents some preliminary findings from a study of the sustainability of programs and activities implemented by institutions that have received ATE grants. Our task was to develop procedures to assess the *continuation* or *persistence* of things (i.e., accomplishments, activities, changes, products, etc.) that remain in place after the grant funding ends.

We gathered information about sustainability using a Peer-Generated Likert Survey that asks current and past Principal Investigators (PIs) to agree or disagree with statements about sustainability made by their ATE peers. There were 22 such statements on the final version of the survey.

Each item was printed as a quoted statement with a request to respond by indicating their degree of agreement. Here is an example:

*"Changes made in our technological education program will continue after our ATE grant has ended." Please indicate the extent to which you Disagree or Agree with the statement using the following response scale: strongly agree, agree, uncertain, disagree, strongly disagree, not applicable.*

The survey was mailed to all active ATE grants that began prior to Jan 1, 2009 and to grants that had expired between Jan. 1, 2007 and Dec. 31, 2009. After excluding planning grants, research and evaluation studies, conference support and duplications, our final sample included 273 sites.

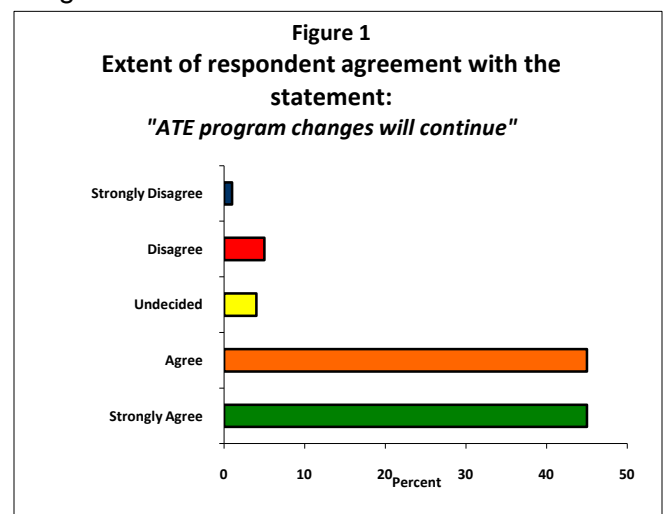
The initial mailing and three follow-up contacts were done in the early spring of 2010. Ultimately, we received 216 completed surveys for a response rate of 82.7%, far exceeding the average response rate for similar surveys reported in the literature. For example, Baruch (1999) and Welch and Barlau (2010) found rates of 56% and 59%, respectively. The response rate for the active grants was 83.8% and 81.2% for the expired group.

### Findings

#### A. Sustainability in General

Our sustainability survey was designed to assess whether or not the PIs of ATE grants thought the work of the active grants would continue, or had continued for expired grants. One survey item addresses this in a general way. "*Changes made in our technological education program will keep going after our current grant ends*".

Figure 1 shows the responses of our sample to the general statement.



The figure shows that 90.9 percent of our respondents either agree or strongly disagree with the statement. (Recall that the original statement was made by a PI about their grants' sustainability and we asked the whole group if that statement applied to their situation.)

We ran the analysis separately for projects and centers and the findings were nearly identical for the above question. The percent agreeing or strongly agreeing was 90.7% for centers and 91.0% for projects.

### B. Dimensions of Sustainability

The survey also included items that assessed several dimensions of sustainability, for example, teaching methods, professional development, collaborations, and faculty networks. Table 1 shows our subjects' response to selected statements about the persistence of the various elements of a grant, for example, teaching methodology, collaborations with industry, distribution of developed materials and dedicated students.

**Table 1.**  
**Extent of Agreement for**  
**Selected Dimensions of Sustainability**

Survey Statement	Percent Agree or Strongly Agree
Teaching methods adapted by our faculty as part of ATE will continue to be used	92.0
Professional development programs we developed are used at other sites	63.3
We have created liaisons with industry and academia that will end	82.5*
Alumni of our project are ambassadors to the larger technology community and tell potential students about the value of technology	80.5
Our grant experience has caused our administration to encourage faculty to seek funding to address workforce needs	77.3
ATE faculty have become part of a collegial network that will continue to share program information, workforce trends, and instructional technologies	87.7
* The percent who disagree or strongly disagree	

Here we see some of the specific areas that have been, or are being sustained by the ATE sites. New teaching methods have been adopted, professional development programs have been used by other institutions, liaisons with industry and academia will continue, students have shown a commitment to the value of technology education, collegial networks were established and are being continued and a grant-seeking environment has been established.

Our final report will include the results for approximately 20 dimensions of sustainability. Most, but not all, are positive indicators of sustainability. For example, of the 72 sites (out of 216) that reported selling educational materials, only 11.4% of them reported they used their revenue to provide scholarships to students.

A threat to the validity of a survey is a tendency for the subjects to respond in a certain way regardless of content. This is sometimes called a response set. For example, a subject may respond in a way that shows the responder in a better light. The fact that the responses varied across items provides some evidence against a response bias. In addition, including several reverse items such as "we have created liaisons with industry and academia that will end" is another way to reduce response sets. (This issue is explored in more detail in our final report.)

The full version of this research entitled "The Sustainability of the Advanced Technological Education Program" by Wayne W. Welch, will be available in November 2010 on the DECA website, <http://www.colorado.edu/ibs/decaproject/>

### *References*

Baruch, Y. (1999). Response Rates in Academic Studies-A Comparative Analysis. *Human Relations* , 451-468.

Welch, W. W., & Barlau, A. N. (2010). (In journal review) *Addressing Survey Nonresponse Issues in Evaluating National Science*. Available from author at [wwelch@umn.edu](mailto:wwelch@umn.edu).