Laying the Foundation for Improving U.S. Workforce Education:

Workforce researchers' expertise, funding sources, and links to NSF's ATE Targeted Research program

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SRI International

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Acknowledgments

Contents

Tables

Figures

Executive Summary

This study sought to characterize the interests, funding sources, and awareness of U.S. community college and workforce researchers about Targeted Research grants offered by the National Science Foundation's (NSF) Advanced Technological Education (ATE) program.

This study identified 136 researchers who had published and participated in research relating to workforce and technician education, community colleges, and other related topics in the past 2 years. In the summer of 2010, SRI International recruited 102 researchers (75% response rate) to participate in a short online survey featuring up to 22 multiple-choice and short-answer questions.

The highlights of the survey findings are as follows:

The Nature of Researchers' Work

- Most researchers reported conducting research on 2-year technical or community colleges, technical/industrial/vocational education, postsecondary workforce development, and STEM. Thirty-eight percent of them studied more than one topic.

Researchers' Awareness of Overall Grant Opportunities

- Researchers reported seeking funding from the following sources: Various federal agencies, including three programs within the U.S. Department of Education and three programs within the National Science Foundation, 10 different foundations, various state agencies, and other sources such as industry and university funders.

- Most researchers reported receiving funding during the period from 2005 to 2010 from federal agencies other than NSF, foundations, state agencies, other industry and university sources, and NSF, in that order.

- Only 2 of the 31 researchers who won funding from NSF between 2005 and 2010 relied solely on that agency for funding; most also obtained funding from one or more other funders.

Researchers' Knowledge and Experiences with ATE

- Forty-two percent of the researchers had "never heard of ATE." Of those, 65% expressed interest in learning more about the ATE Targeted Research program.

- Only 22% of the respondents to this survey had applied and won an ATE grant in the past. Those winning ATE grants in the past reported studying technology/technical skills, ATE's impact or effectiveness, and postsecondary workforce supply and demand.

- Thirty percent of those who had applied for ATE grants had not won them.

- Forty-four percent of researchers who knew about ATE had "never" applied for a grant. A third of these researchers reported that they did not have enough time or resources to compose a grant proposal and 27% reported that the grant call did not match their research focus.

- Among the 59 researchers who had heard of ATE, 38% suggested publicizing the Targeted Research program more and 18% suggested simplifying the application process.

- Researchers preferred using the following sources to learn about grant opportunities: websites of various professional associations or government agencies, word of mouth, and professional conferences or organizations.

- The 58% of researchers who had heard of ATE mostly learned about it from a colleague, the NSF website, or a professional conference.

- Researchers reported seeking between $200,000 and $1.5 million for their grants.

Implications and Recommendations

- The survey results suggest that the level of awareness about the ATE program among workforce researchers is lower than might be expected—with 4 in 10 of the study's workforce researchers reporting they have "never heard" of ATE. Only 2 in 10 have applied for and won ATE grants.

- Based on survey respondents' feedback, this lack of awareness among workforce researchers appears to be more of a limitation to realizing the ATE program's potential for workforce research than the difficulty of applying to the program.

- The study also indicated a possible cultural divide between researchers and community colleges, as evidenced by the relatively high number of researchers who only "occasionally" come into contact with community college personnel and concerns about the budgetary pressures of research, the research capacity of community colleges, and requirements to collaborate with community college practitioners.

- On an encouraging note, two-thirds of the workforce researchers who were unaware of ATE expressed an interest in learning more about it. Nearly half of the researchers who were familiar with ATE suggested more publicity as a key outreach strategy.

- ATE might consider increasing its presence at the professional meetings these researchers attend and in the publications and websites these researchers follow.

Introduction

Since the 2008 recession, policymakers have given the nation's network of roughly 1,200 local community colleges in the United States a tough assignment. They hope these institutions will improve the availability of a qualified workforce for the middle class jobs of the knowledge economy. Their strategy rests on a belief that closer partnerships between local employers and community college educators will lead to better systems for raising the skills of workers for better paying technical jobs in industry.

Such industry-school partnerships have been historically part of the community college mission, beginning with the G.I. Bill after World War II. Yet the challenge that community colleges face is heightened by other recent trends. Economists predict the 2008 recession will accelerate changes in the U.S. economy that were already well under way (Carnevale, Smith, & Strohl, 2010). U.S. workers will continue to see their jobs go overseas as global employers seek more affordable and better-trained employees. Technological innovations stemming from the Internet-driven information revolution will continue to shrink once robust job sectors and make it possible for distant workers to undercut the cost of local hires. The students entering the nation's community colleges from the K-12 education system are continuing to perform more poorly in all subjects, particularly mathematics and science, than their peers in Europe and Asia. Owing to demographic shifts and K-12 educational challenges, an increasing number of U.S. students come from immigrant families or families without a tradition of postsecondary education. Postsecondary students abroad are attending and completing college in greater numbers than before, a trend that has knocked the United States from its historically unique position of having the highest proportion of its citizens with college credentials.

While much of the current policy focuses on channeling more funding directly to the educators who run the community colleges, there is also increasing awareness that research will be needed to describe, analyze, and evaluate this national postsecondary educational mobilization. Just as *A Nation at Risk* called to action K-12 reformers three decades ago, recent reports by policy advocates and social scientists (Arum & Roksa, 2011; Miller & Ewell, 2005; Spellings, 2006), and initiatives by the philanthropic community, have produced a groundswell of interest in postsecondary education. Within this sector—the community colleges as well as many private 2-year technical colleges and for-profit colleges—are viewed as the best bet for leading this movement. With its traditions of open enrollment, neighborhood location, relatively lower cost, flexible scheduling, and direct partnership with local employers, community colleges and technical colleges contain many of the primary ingredients for meeting the historic educational challenges of the moment.

Against this backdrop, the NSF's Advanced Technological Education (ATE) program supported a study to characterize the research community that has focused on these institutions and priorities. This study was sponsored under an umbrella research effort called Discovering the Educational Consequences of Advanced Technological Education (DECA), a program intended to kick-start greater research into technician education from the unique perspective of the NSF. This perspective emphasizes the link between scientific and technological innovation that leads to new kinds of high-skilled jobs. Economist Anthony Carnevale (2010) has predicted that the jobs produced in this sector will continue to grow in income competiveness and maintain their proportionate share of the overall jobs through 2018. However, past research suggests ATE's workforce training programs might not exert sufficiently powerful influence on a college's institutional processes to have the level of impact desired within the current policy context (Bailey, Matsuzuka, Jacobs, Morest, & Hughes, 2003). A core goal of ongoing research should be to identify how the program's longtime focus on technical training partnerships, career pathways, instruction, and faculty development may contribute to the institutional change that will contribute to the nation's growing workforce training demands.

ATE has formally added a new Targeted Research section to its annual request for proposals. This element represents an expansion of ATE's prior approach, which channeled funding solely to nonresearch practitioners in community colleges. This study examines the work of prospective applicants to the Targeted Research program, characterizing these researchers' interests, funding sources, and typical ways of learning about grant funding. In a larger sense, this study can serve as an avenue for elevating the importance of research among community college and career technical education practitioners. The challenges facing U.S. community colleges and workforce trainers are great, and researchers can help by documenting and sharing the ideas and innovations created to meet these challenges.

Study Design
Goals

The survey was designed to target researchers studying technical education for workforce and community college training. The purpose of the survey was to (1) help NSF understand how these researchers are funded and (2) raise awareness in this researcher community about NSF's Targeted Research opportunity.

Sample Selection

To identify the sample of researchers, the team reviewed authors from a list of community college and career and technician education journals culled from the list of 47 relevant core journals compiled by Waugh (2004) and an online review of all journals and articles containing research mentioning career technical education over the past 20 years. An additional review analyzed the topics addressed in these journals. Those that focused on allied health, nursing, and early childhood fields were removed, as ATE does not address these topics.

A review of the citation frequencies and library subscriptions for the remaining 44 journals was conducted. As a result, the team decided to focus the search on a subset of journals with the most citations and library subscriptions, including—but not limited to—the following six: *Community College Journal, New Directions for Community Colleges, Community College Review, Journal of Vocational Education Research, Journal of Industrial Teacher Education, and Community College Journal of Research and Practice.* From this list, researchers scanned journal issues from the preceding 2

years via online libraries. The team reviewed the article titles and abstracts, focusing on authors whose articles related to Advanced Technological Education (ATE), career and technical education (CTE), career pathways, and vocational technical education. In addition, researchers also scanned the editorial boards for these journals to identify researchers. Then an online search was conducted to check whether the editors' past research aligned with the main categories of interest. If their research did align, their names were included in the sample for the survey. The team also gathered names of principal investigators from current and past ATE projects that included a research focus.

From this review process, the SRI team developed an initial list of 160 researchers. Some researchers on this list were from centers with several other researchers focusing on research in the areas of ATE, CTE, career pathways or vocational technical education. To avoid oversampling from any single research center, we called the center directors to help identify which of their researchers we should include. After this was determined, 136 researchers were invited to participate in the survey.

Sample Characteristics

There were 52 men and 50 women. Of those, 72% worked at 4-year universities, 22% worked at other types of research centers, and just 4 worked in two-year colleges. The researchers came from 27 states plus Washington, D.C.

Table 1 shows the department affiliations of the 78 university and college researchers participating in the survey.

Table 1. Numbers of university and college participants affiliated with specific types of departments

Department Title	Frequency
Education	20
Workforce Development	13
Agriculture	7
Occupational Studies	5
Human Resources	5
Science (2 Physics, 1 Chemistry, 1 Earth Science)	4
Higher Education	4
Adult Education	4
Economics	3
Materials Science	1
Engineering	1
Other	11
Total	78

$N = 78$

Survey Development

The ATE Outreach Survey was developed by SRI and modified with feedback and pilot testing by two members of the DECA Research Review Committee.

The survey was divided into two distinct sections. The first section focused on general information about the participants' work contexts and their strategies and preferences for obtaining grant funding. The second section focused on the participants' knowledge and experience with ATE.

The survey was designed with branching questions, which filtered participants to different sections of the survey based on their responses. In the first section of the survey, 35 participants who did not support graduate students in research branched directly to the ATE questions. In the second section, 43 participants who had never heard of the ATE program branched directly to the end of the survey (see Appendix A for the full survey).

For ease of administration and participation, the survey was administered through an online survey service, QuestionPro. It was designed to take a maximum of 10 minutes to complete (though some participants took a bit longer according to online records). Participants who did not conduct research or were not familiar with the ATE program were able to complete the survey in about 2 to 4 minutes. Participants in the survey were not compensated.

Data Collection Process

Once the survey was finalized, a mass online invitation (Evite) was sent to the final list of 136 researchers. The researchers had three options: (1) completing the online survey immediately; (2) calling an SRI researcher who would complete the online survey via telephone interview; or (3) choosing not to respond.

Strategies for Reaching High Response Rate

The survey invitation was initially sent online to potential respondents in April 2010. It was followed by a second online invitation sent 2- to 3-weeks later. In this initial wave, 35 researchers responded and 3 declined. Weekly email reminders were sent for the next 3 weeks. The team checked academic calendars for all the remaining non-responders, immediately calling those whose academic session ended before the end of May. After that point, email reminders were sent for the subsequent 3 weeks. Finally, the team placed direct calls to all remaining researchers using a telephone script. In September, the survey was closed with a total sample of 102 respondents for a response rate of 75%.

Researchers' Background

The Nature of Researchers' Work

Several questions asked researchers about the nature of their work. About half the researchers (52%) reported interacting only "occasionally" with personnel at community colleges. The second highest group of respondents (28%) reported that they interacted "frequently" with community college personnel. The overwhelming majority (90%) reported that they currently conducted research or planned to conduct research in the future. About two-thirds (66%) reported that they supervised graduate student research and most reported that they were required to seek grant funding for their work (84%). Most (80%) supported the majority of their work by applying for external funding only or both external and internal funding.

Preferred Current and Future Research Topics

The survey asked researchers about their current and future research interests.

All 102 participating researchers selected among nine categories to describe their work, as shown in Figure 1. Of the 102 researchers who responded, over half (62%) selected one category to describe his or her work. The remaining 38% selected more than one category.

Figure 1. Categories of researchers' current work
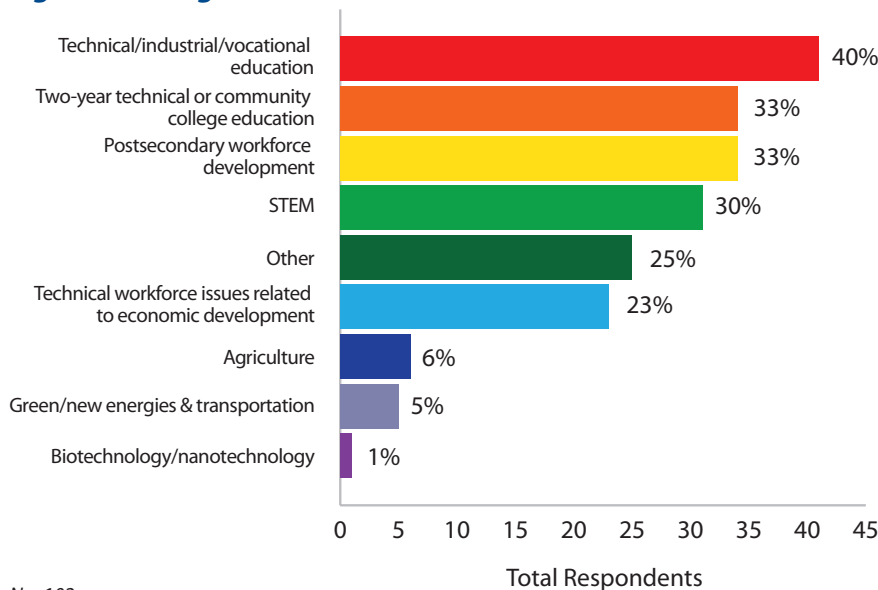
N = 102

Note: Researchers could check all the topics that applied; therefore, the overall number of responses is 200, which exceeds the number of respondents. Percentages reflect respondents per category divided by total respondents.

As may be seen from the graph, most of the researchers worked in areas relevant to ATE's core mission. Of the 25 researchers who selected "other," most (56%) clarified their work, such as, "university professor, CTE research, evaluation of STEM education." However, others (44%) mentioned additional topics of research interest, such as nursing, human performance improvement programs, research and development in higher education, grant writing, and racial equity.

The survey also contained an open-ended question on the researchers' preferred future research opportunities. This question prompted researchers to discuss research topics and their preferences for funding amounts and methodologies.

Of the 102 participants who responded, only 71 answers could be analyzed as 9 left it blank and 22 reported "no comment" or "not seeking funding at this time." A qualitative analysis was conducted that involved grouping responses under common categories and tallying the number of responses in each category. Subsets of responses were grouped according to prevailing theme. Since researchers self-selected to focus on different aspects of the question, these results need to be interpreted cautiously. Given that not all survey respondents answered the question in the same manner, the distributions may not be representative of the overall sample. It is not clear why different people may have chosen to focus on different aspects of this question and have given different types of responses.

The first prevailing theme, reported by 57 respondents, was the topic of research. These are presented in Table 2.

Table 2. Preferred topics for future research

Topics	Frequency
Career/technician education, career pathways/programs of study	17
Workforce development/work-based learning/student entrepreneurs	9
STEM, geoscience, renewable energy, green jobs	8
Professional development and leadership development	7
Minority students and females	6
Cognitive studies	4
Assessment	3
College connections to employers	2
Health care	2
Rural communities/ families	2
Comparative international workforce education	1
Organic chemistry	1
For profit colleges	1
ATE project database	1
Total	57

N = 57

The second prevailing theme, reported by 27 respondents, was funding ranges for future grants (see Table 3).

The respondents also mentioned several federal agencies that they intended to solicit for funding, including, but not limited to, U.S. Department of Education, U.S. Department of Agriculture, National Institutes of Health, and the National Science Foundation. The lone respondent who mentioned that he/she sought funding in the $50,000,000 range also stated that he/she was currently conducting research for the U.S. Navy at this level of funding.

Table 3. Preferred future funding ranges

Grant Range	Frequency
$150,000 & under	2
$200,000—$500,000	11
$800,000—$1,500,000	11
$3,000,000—$5,000,000	6
$6,000,000—$10,000,000	3
$50,000,000	1

N = 27

Note: Some of the 27 researchers mentioned more than one funding range. Ranges were described by researchers and therefore not presented in continuous fashion.

Researchers' Knowledge of Grant Opportunities

Of the 102 researchers participating in the study, most of them (72%) reported regularly seeking external funding from government and foundation sources to support their work. The researchers receiving support from state agencies came from the following states: Georgia, Illinois, New York, Michigan, Ohio, North Carolina, and Kentucky. Those citing "other" types of funding listed as sources industry, university, local government, research centers, or professional groups. When asked to describe the kinds of funders they typically approached, the most commonly cited sources were as follows:

1. The National Science Foundation: Advanced Technological Education (ATE), Broadening Participation in Computing (BPC), and Innovative Technology Experiences for Students and Teachers (iTEST)

2. U.S. Department of Education: Institute for Education Sciences (IES), Office of Vocational and Adult Education (OVAE), and Fund for Improvement of Postsecondary Education (FIPSE)

3. Foundations: Gates, Lumina, Ford, Sloan, Hewlett, Irvine, Beckman, Dreyfus, Research Corporation for Science Advancement, and Jobs for the Future

4. University and industry funders

5. State departments of education

6. Other federal agencies besides the National Science Foundation (U.S. Departments of Labor, Agriculture, and Commerce; National Institutes of Health, Agency for International Development)

The overall distribution of funding sources is shown in Figure 2.

## Figure 2. Funders that researchers solicited most frequently for funding
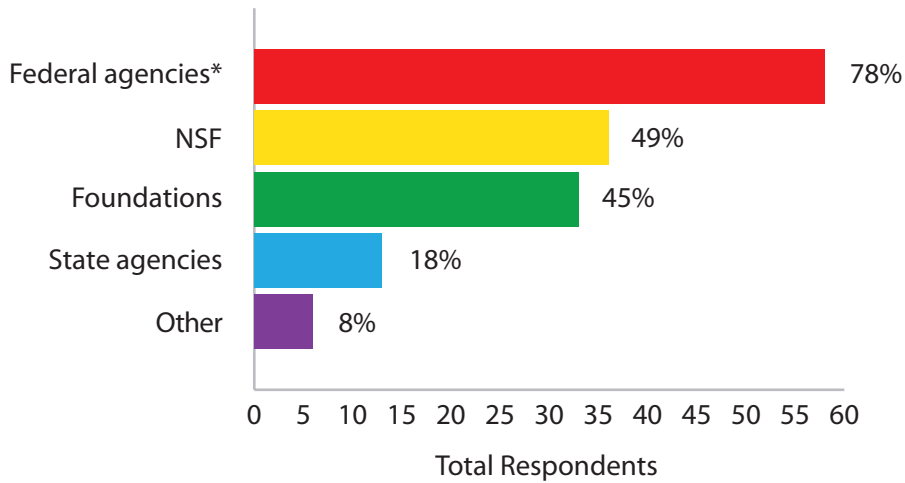
N = 74
* Federal agencies other than NSF
Note: In open-ended responses, researchers mentioned more than one agency; therefore, the overall number of responses is 146, which exceeds the number of respondents. Percentages reflect respondents per category divided by total respondents.

While these analyses indicate the sources from which the researchers *seek* funding, another set of questions had them identify the primary sources from which they actually *received* funding between 2005 and 2010. During that time, 72% who regularly sought external or both external/internal funding reported receiving support from federal agencies other than NSF, state and private funders, foundations, and NSF (see Figure 3). In addition, a few researchers reported receiving funding from their universities through research centers, intramural funds, and individual contracts.

Figure 3. Primary funding sources for researchers between 2005–2010
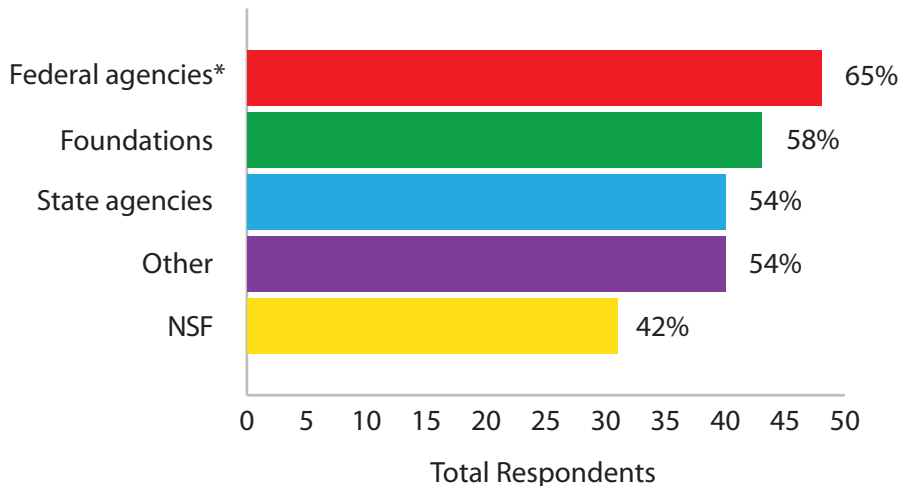
N = 74
* Federal agencies other than NSF
Note: Researchers could check all that applied; therefore, the overall number of responses is 202, which exceeds the number of respondents. Percentages reflect respondents per category divided by total respondents.

In open-ended responses, 18 of the 31 NSF-funded researchers named the specific NSF divisions and programs that supported their work. Fifteen received funding from the Division of Undergraduate Education (DUE). A smattering of researchers tapped into other NSF divisions. Table 4 shows the distribution across the divisions and programs.

Table 4. NSF divisions and programs that researchers solicit for funding

NSF Divisions	Overall Frequency	Relevant Programs*	Frequency
Undergraduate Education	15	ATE	10
		CCLI/TUES	2
		STEP	1
		NSDL	1
		GK-12	1
Human Resource Development	2	GSE	2
Research on Learning in Formal and Informal Settings	2	REESE	2
Social and Economic Sciences	3	Economics	1
		Science Technology and Society	2
Atmospheric and Geospace Sciences, Earth Sciences, Ocean Sciences	1	Geoscience	1
Engineering Education and Centers	1	IEECI	1
NSF-wide or NSF Directorate Level	4	HSD	1
		SBE	1
		RUI	1
		CISE	1

N = 18

*Note: In open-ended responses, researchers mentioned more than one agency; therefore, the overall number of responses exceeds the number of respondents. The full names of each program are as follows: Course, Curriculum, and Laboratory Improvement (CCLI) now Transforming Undergraduate Education in Science, Technology, Engineering and Mathematics (TUES); Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP); National STEM Education Distributed Learning (NSDL); Graduate STEM Fellows in K-12 Education (GK-12); Research on Gender in Science and Engineering (GSE); Research and Evaluation on Education in Science and Engineering (REESE); Innovations in Engineering Education, Curriculum, and Infrastructure (IEECI); Human and Social Dynamics (HSD); Directorate for Social, Behavioral, and Economic Sciences (SBE); Research in Undergraduate Institutions (RUI); Directorate for Computer and Information Science and Engineering (CISE).

Overall, the researchers demonstrated resourcefulness in their grant seeking, with most obtaining funding from more than one funding agency (see Figure 4).

Figure 4. Number of primary funding sources reported by researchers, 2005–2010

Legend:
- Four or more funding sources (10%)
- Three funding sources (37%)
- Two funding sources (35%)
- One funding source (18%)
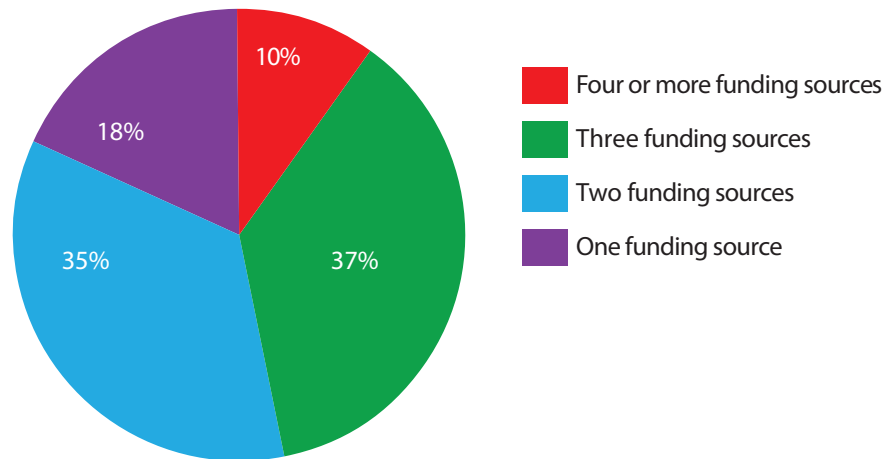
N = 74

Note: Primary funding sources were NSF, federal agencies other than NSF, foundations, and other funders including state agencies, university funding, contracts, industry, and private grants.

Of the 31 researchers who received support in the past 5 years from NSF, Figure 5 shows that most reported receiving funding from more than one agency.

Figure 5. Numbers of funding sources for NSF-supported researchers, 2005–1010

Legend:
- NSF only (6%)
- NSF + 1 other funder (26%)
- NSF + 2 other funders (45%)
- NSF + 3 other funders (23%)
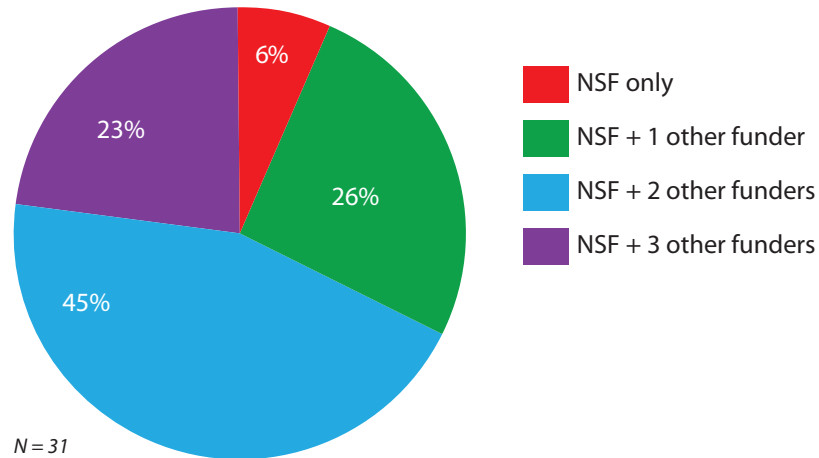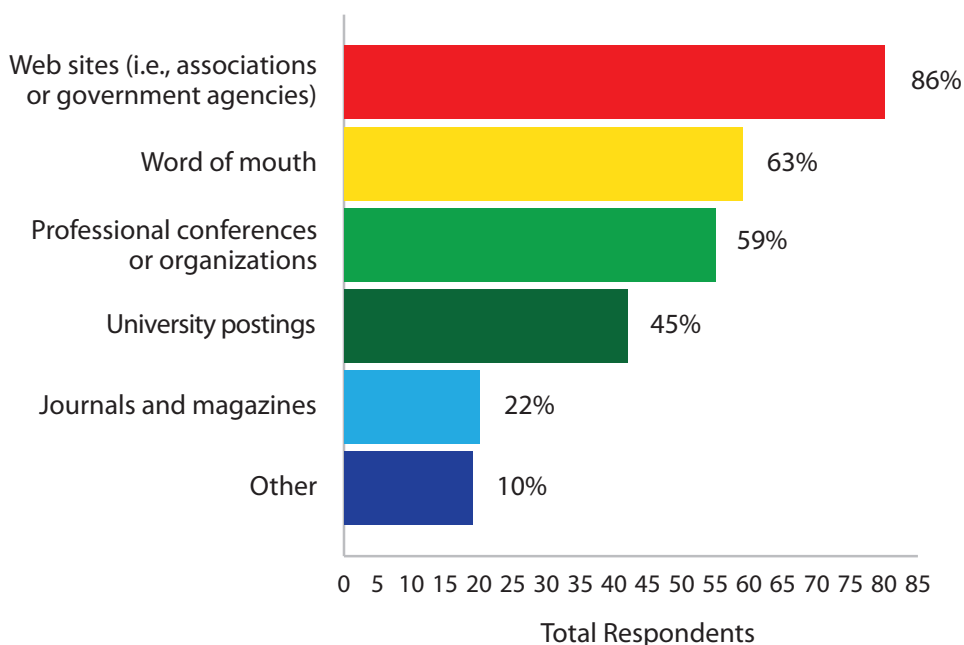
N = 31

Of the 31 researchers funded by NSF, 18 researchers listed the names of other funders of their work in the past 5 years. The largest category of funders listed was foundations. These included: Gates, Ford, Lumina, Carnegie, Beckman, Hewlett, and Irvine. Other funding sources included other federal agencies than NSF (17), state agencies (4), and industry/university sources (8).

Ways Researchers Hear About Funding Opportunities

The survey presented researchers with a list of possible ways of hearing about grants. They were asked to select all the options they used, or describe alternative approaches. Of the 102 researchers, 93 responded. It is unclear why 9 skipped this question.

Websites of various professional associations or government agencies were rated highest (see Figure 6). Websites were followed by "word of mouth" and "professional conferences or organizations."

Figure 6. Best ways to learn about grant opportunities

Horizontal bar chart titled with x-axis "Total Respondents" ranging from 0 to 85:
- Web sites (i.e., associations or government agencies): 86%
- Word of mouth: 63%
- Professional conferences or organizations: 59%
- University postings: 45%
- Journals and magazines: 22%
- Other: 10%

N = 93
Note: Item asked respondents to select all that applied, therefore, the overall number of responses was 275, which exceeds the number of respondents. Percentages reflect respondents per category divided by total respondents.

Some researchers checked multiple options: 14% selected five options, 18% selected four options, 29% selected three options, 26% selected two options, and 13% selected only one of the options from the list. For respondents who selected more than one option, the most common pairings of options for learning about grants were by websites, professional conferences and word of mouth (34%). Eighteen percent of respondents paired websites with word of mouth, and 14% paired websites with professional conferences.

In open-ended responses, 19 researchers also listed other options, such as e-mail lists and updates from professional societies and associations.
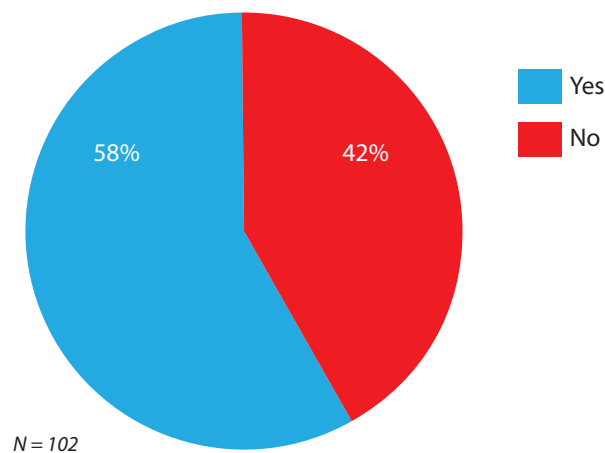
Researchers and ATE

Researchers' Knowledge and Experiences with ATE

Among the 102 survey participants, most had heard of the ATE program, but a sizable percentage had not (see Figure 7).

Figure 7. Percentage of researchers familiar and unfamiliar with ATE before taking the survey

N = 102

Of the 58% of respondents who had previously heard of ATE, the survey asked where they had heard about the program. Figure 8 shows the number of respondents who chose each possible information source. The most common way people heard about ATE was from a colleague. NSF notices on funding opportunities, such as an RFP, were another common source. Such notices are typically posted on the agency website. The third most common way respondents heard about ATE was from professional conferences or organizations. Of the 10 who selected "other," 5 reported previous experience with ATE as a PI or evaluator, 3 reported university meetings and courses, 1 reported the American Association of Community Colleges (AACC), and 1 reported having been a program officer in NSF's Division of Undergraduate Education.

Figure 8. Researchers' sources of information about ATE
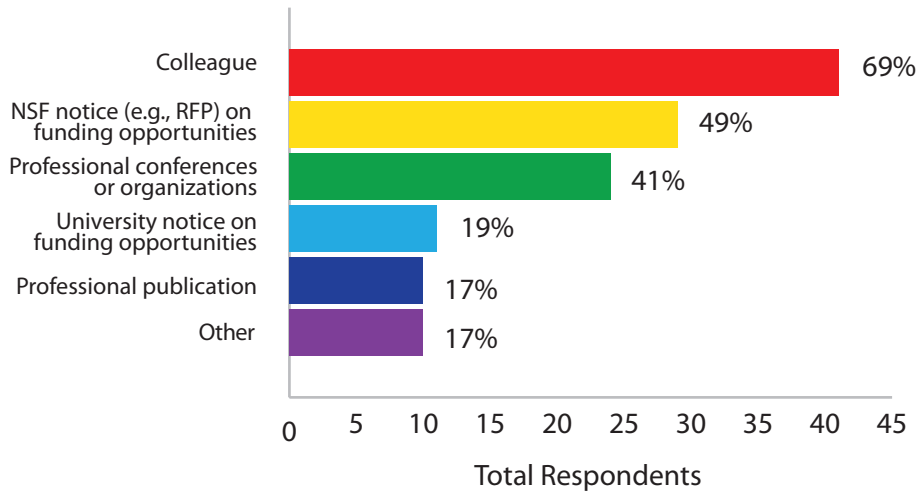
N=59

Note: Item asked responders to select all that applied. Therefore, the overall number of responses, 125, exceeded the number of respondents. Percentages reflect respondents per category divided by total respondents.

The 59 researchers who had heard of ATE were asked whether they had ever applied for an ATE grant and, if so, how many grants they had won. Figure 9 shows their responses in relation to the entire sample of 102 researchers, including those who had not heard of ATE.

Figure 9. Distribution of researchers according to familiarity with ATE and past history of applying for ATE funding
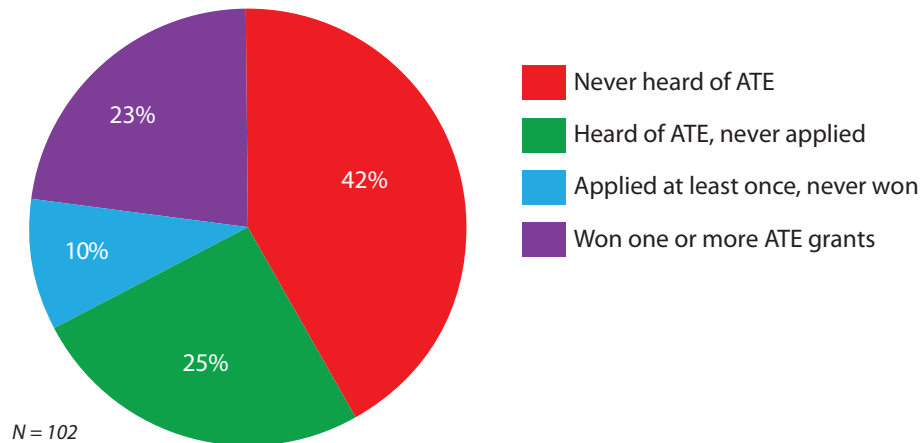
N = 102

In exploring the data of the ATE winners (*N* = 23), 7 had applied just once for an ATE grant and 16 had applied multiple times. As may be seen from Figure 10, only 3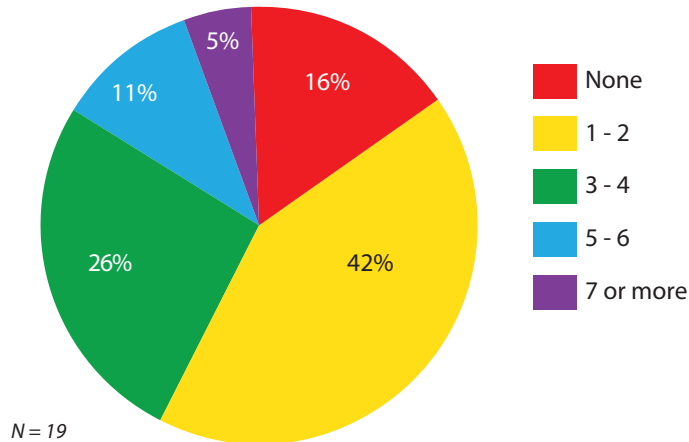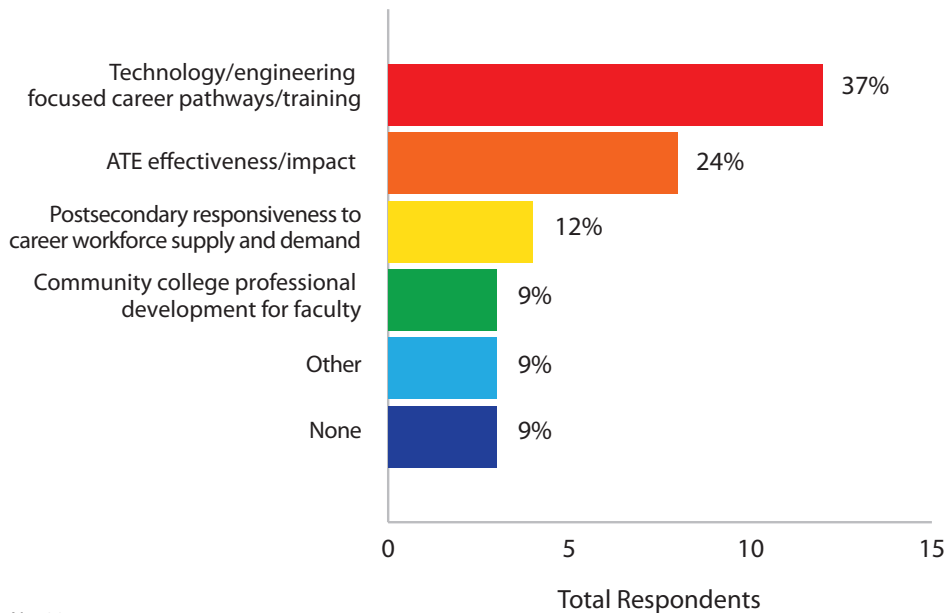 (16%) who applied multiple times failed to win any ATE grant. Most of these researchers were successful in their ATE applications.

Figure 10. Numbers of ATE grants won by researchers applying multiple times

- 16% None
- 42% 1 - 2
- 26% 3 - 4
- 11% 5 - 6
- 5% 7 or more

N = 19

Thirty of the 33 researchers who applied for an ATE grant, and either won or lost, adequately described their research topics through one of two open-ended questions. A qualitative analysis was conducted on both items. Each response was categorized based on themes identified within the data. Frequencies were obtained within the most common categories, as shown in Figure 11.

Figure 11. Research topics of ATE grant proposals

- Technology/engineering focused career pathways/training: 37%
- ATE effectiveness/impact: 24%
- Postsecondary responsiveness to career workforce supply and demand: 12%
- Community college professional development for faculty: 9%
- Other: 9%
- None: 9%

Total Respondents

N = 33
Note: Data were coded from open-ended responses.

Among the 59 researchers who knew of ATE, 44% had never applied for a grant. They were asked to check their main reason for not applying. Figure 12 shows the choices they selected from a list. The most popular responses were that respondents did not have enough time or resources to apply or that the grant call did not match their research focus. Three of the possible reasons listed—all relating to institutional support for such research—were not selected by any of the respondents.

Eleven respondents checked the open-ended "other" to describe their reasons for not applying to ATE. Of these, 7 were recoded into one of the original categories. Of the 4 researchers remaining, 3 said they had not been aware that the ATE program funded research and the fourth said he or she was presently considering applying to ATE.

Figure 12. Main reason for not applying to ATE
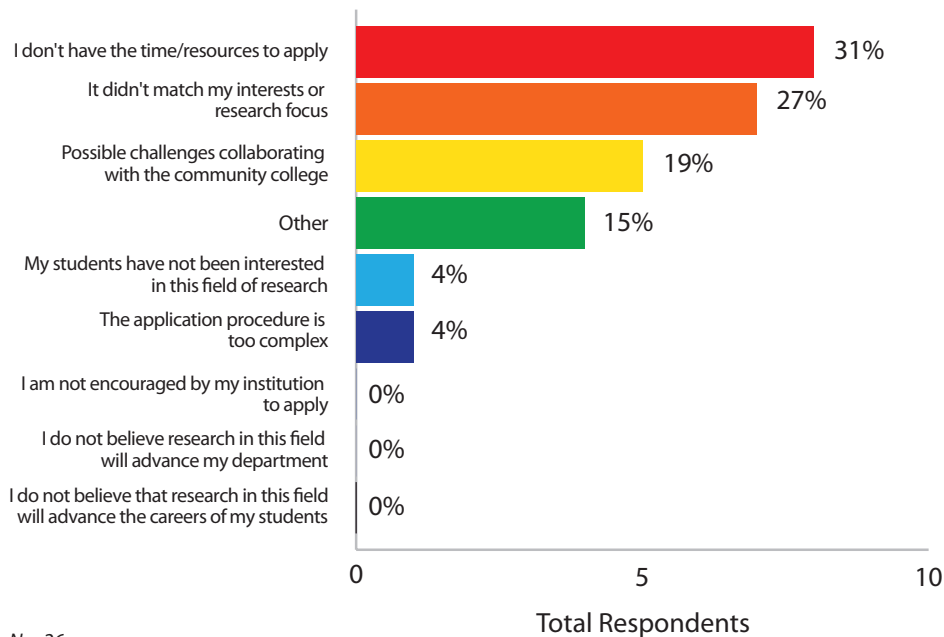

N = 26
Note: Respondents selected one answer.

Researchers' Suggestions for Increasing ATE Research Applications

The 59 respondents who had previously heard of ATE were asked to suggest the most effective things that NSF could do to encourage other researchers to apply. Figure 13 shows the distribution across the categories provided on the survey. Also included in Figure 13 are categories that emerged from the "other" open-ended response option two or more times.

Figure 13. Suggestions for most effective ways to encourage more research applications to ATE
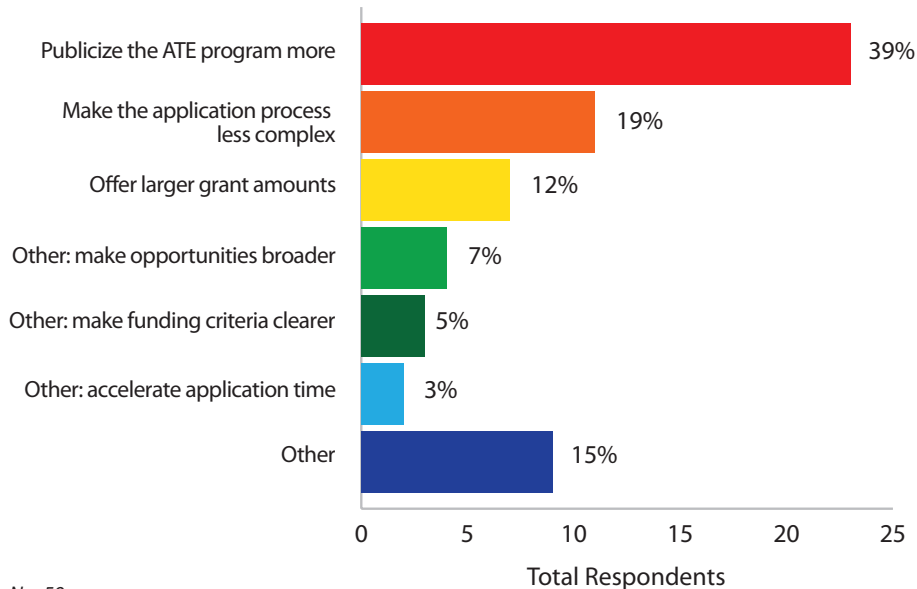
N = 59
Note: Respondents selected one answer.

Of the remaining nine "other" responses, three were not informative, but six provided additional ideas:

- Limit requirements for technical colleges to be directly involved
- Make a Special Interest Group (SIG) for technological education in AERA or other similar organizations
- Renegotiate indirect rate with universities
- Work to create an infrastructure for collaboration and mentorship
- Continue what ATE is currently doing
- Value the participation of educational researchers in interdisciplinary partnerships, and ensure representation on review panels

In an open-ended question soliciting further thoughts and comments, several researchers offered additional comments that provide insight into their concerns with the ATE program. These are listed below:

- "Most community colleges do not have the capacity to conduct grants of this caliber. They want to collaborate with universities, yet in doing so they have difficulty providing the necessary human resources to be project directors. There needs to be more flexibility in the

collaboration between community colleges and universities. In the end, the community colleges will benefit when they collaborate with a university on an ATE grant compared to the current mode of operation—they do not have the capacity to lead an ATE grant."

- "This is an area of funding and objectives in which I did—and still do—have great interests and expertise. I did find, however, that the application processes with federal agencies particularly was really tedious and time consuming. This, combined with the tedious and time-consuming requirements of the university, was quite discouraging when seeking support for this important line of research."

- "When pre-proposals are submitted and encouraged, it would be helpful to have an assigned person to ask questions. Particularly if the review was encouraging, as I am hoping the latest submission will be. The first three submissions were disappointing as a . . . colleague at another institution in engineering was trying to mentor me through the process. This time I am working with a grant writer . . . who has had success with other funding agencies. We will see."

- "The program should parse out the language on the website. People are looking for research support. Identify exactly which programs are offering the specific topics in research because the website is daunting."

- "Representation of researchers in the field of career and workforce education on review panel is critical to ensure balanced reviews of proposals."

- "ATE/NSF must consider the enormous indirect charges for university based research. When we lose 50% or more of our grant to the university, it either greatly decreases the amount of people power we can apply to the research, or we have to ask for much more money. The NSF-negotiated rate becomes a subsidy to universities who have entrepreneurial faculty, and unfortunately grant-getting is not rewarded by the university."

Finally, of the 43 researchers who had never heard of the ATE program, about two-thirds expressed interest in learning more (see Figure 14).

Figure 14. Researcher interest in learning more about ATE grant opportunities

65%   35%

Yes
No

N = 43
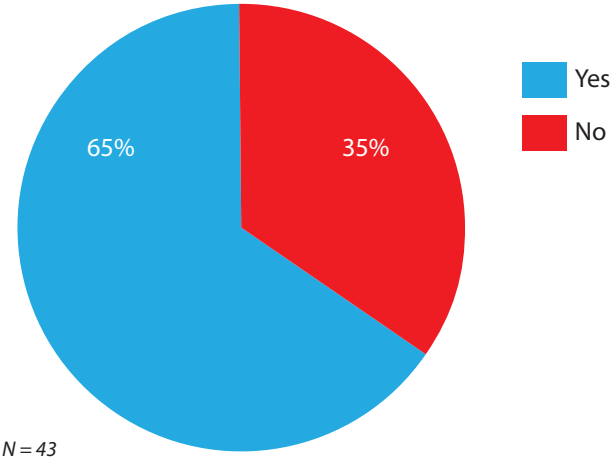
Implications and Recommendations for ATE

"There needs to be more flexibility in the collaboration between community colleges and universities. "

The survey results suggest that the level of awareness about and participation in the ATE program among workforce researchers are lower than might be expected—with 4 in 10 of the study's workforce researchers reporting they have "never heard" of ATE. Only 2 in 10 have applied for and won ATE grants.

This lack of awareness among workforce researchers appears to be more of a limitation to realizing the ATE program's potential for workforce research than, say, the difficulty of applying to the program. Relatively few researchers said they lacked the resources and time to apply. Half of those who have applied once to ATE won grants and two-thirds of those applying multiple times won. Most of these researchers are resourceful, applying for funding from a range of federal grant-making agencies, foundations, and local programs on a regular basis.

Further, the ATE program's research goals, which focus on technical education, career pathways, and program effectiveness, appear to be consistent with the research interests of all but a handful of the study's research participants. Further, it is worth noting that not one researcher reported that winning an ATE grant would be viewed at their institutions as inconsistent with furthering their career goals—or those of their students.

Another difficulty was indicated by the relatively infrequent levels of interaction with community college personnel reported by slightly more than half the researchers. Although the next highest group reported "frequent" contact, most said contact was typically only "occasional." A few comments by survey participants—such as one noting that community colleges lack the capacity to lead large grants and another suggesting that ATE should reduce requirements to collaborate with community college faculty—indicate that there may be a cultural divide to be addressed. Even in its Targeted Research program, ATE wants community college practitioners involved in the research and consulted by the researchers. When tensions such as these are coupled with researchers' budgetary concerns about these grants, it suggests that ATE may need to address this possible cultural divide.

"The program should parse out the language on the website. People are looking for research support. Identify exactly which programs are offering the specific topics in research because the website is daunting."

The good news is that two-thirds of the workforce researchers who are unaware of ATE expressed an interest in learning more about it. Nearly half of the researchers who were familiar with ATE suggested more publicity as a key outreach strategy. Researchers most frequently selected websites, particularly those associated with their own professional organizations, and word-of-mouth as their preferred methods for learning about grants. As the word gets out, ATE should expect more applications to its Targeted Research program.

ATE might consider increasing its presence at the professional meetings these researchers attend and in the publications and websites these researchers follow. The current study did not set out to identify these, but some of the highly cited journals that the study team used to select these researchers might provide a starting point. In addition, ATE should reach out to researchers at the community college and postsecondary organizations and advocacy groups that hold annual meetings. Participating in these outreach activities may provide avenues for future discussion to bridge the divide between workforce researchers and ATE.

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Appendix A. Full Survey

Variable	Question	Answer Options	Branching Logic
B_1	Which of the following categories describes your work? (Check all that apply.)	1 = Two-year technical or community college education or leadership 2 = Technical workforce issues related to economic development 3 = Postsecondary workforce development 4 = Science, Technology, Engineering, and Mathematics (STEM) 5 = Agriculture 6 = Biotechnology/ Nanotechnology 7 = Technical/ Industrial/Vocational Education 8 = Green/New Energies and Transportation 9 = Other (Please describe.)	
B_2	Does your work require you to interact directly with community college personnel?	1 = Constantly 2 = Frequently 3 = Occasionally 4 = Never	
B_3	Do you currently conduct research or plan to in the future?	1 = Yes 2 = No	
B_4	Do you supervise/advise graduate student research?	1 = Yes 2 = No	
B_5	What is the best way for you to learn about grant opportunities? (Check all that apply.)	1 = Yes 2 = No	
B_6	How is most of your (or your graduate students) research funded?	1 = Internally (e.g., by your university) 2 = Externally (e.g., private grants, government agencies) 3 = Both	If (1) selected go to B_9 (2) & (3) selected go to B_7

Variable	Question	Answer Options	Branching Logic
B_7	Please describe the kinds of agencies that you typically consider when seeking grant funding for your work.	Open text	
B_8	Within the last five years, what other kinds of external agencies have supported your research? (Check all that apply.)	1 = Industry 2 = Private Grants 3 = Foundations 4 = Federal Agencies 5 = State Agencies 6 = Local Agencies 7 = Other	
B_8opt	(Optional) If you would like, please provide the names of some of these agencies and organizations that have supported most of your research.	Open Text	
B_9	What research opportunities are you seeking in the future? Please feel free to describe research areas and funding amounts (ranges, time frames) that would best support your work.	Open Text	
ATE_1	Before this survey, had you heard of ATE?	1 = Yes 2 = No	If (1) selected go to ATE_2 (2) selected go to ATE_8
ATE_2	Where did you hear about ATE? (Check all that apply.)	1 = Colleague 2 = University notice on funding opportunities 3 = NSF notice (e.g., RFP) on funding opportunities 4 = Professional publication 5 = Professional conferences or organizations 6 = Other	
ATE_3	Have you ever applied for an ATE grant?	1 = Yes, once 2 = Yes, multiple times 3 = No	If (1) selected go to ATE_4 (2) selected go to ATE_5 (3) selected go to ATE_7
ATE_4	Was your grant proposal(s) awarded?	1 = Yes 2 = No	Goes to ATE_6
ATE_4txt	Briefly characterize the topic your grant proposal addressed whether awarded or not.	Open Text	Goes to ATE_6

Variable	Question	Answer Options	Branching Logic
ATE_5	Please check the box that best reflects how many of your applications were awarded.	1 = None 2 = 1-2 3 = 3-4 4 = 5-6 5 = 7 or more	Goes to ATE_6
ATE_5txt	Briefly characterize the topics your grant proposals addressed whether awarded or not.	Open text	Goes to ATE_6
ATE_6	What is the most effective thing that ATE can do to encourage other researchers like you to apply?	1 = Make the application process less complex 2 = Publicize the ATE program more 3 = Offer larger grant amounts 4 = Other	Goes to ATE_9
ATE_7	Please check your main reason for not applying to the ATE program	1 = The application procedure is too complex 2 = It didn't match my interests or research focus 3 = I don't have the time/resources to apply 4 = I am not encouraged by my institution to apply 5 = My students have not been interested in this field of research 6 = I do not believe research in this field will advance my department 7 = I do not believe that research in this field will advance the careers of my students 8 = Possible challenges collaborating with the community college 9 = Other	Goes to ATE_9
ATE_8	Would you be interested in learning more about the ATE program and its grant opportunities?	1 = Yes 2 = No	
ATE_9	Please use the space provided if you have any additional comments on the topics addressed in this survey.	Open Text	
ATE_10	Thank you for completing our survey. If you are interested in being on our mailing list to receive results of this work, please enter your email here.	Open Text	