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In 2009, the National Science Foundation's Advanced Technological Education projects and centers

- served 85,300 students—52 percent of whom were at two-year colleges and 37 percent were at secondary schools<sup>1</sup>
- supported programs at 1,300 educational institutions across the country—42 percent of which were at two-year colleges and 47 percent were at secondary schools
- developed 1,740 curriculum materials
- offered 2,256 professional development opportunities, which served 58,100 educators—47 percent of whom were two-year college faculty and 27 percent were secondary school teachers
- had 1,372 articulation agreements in place, which involved 958 institutions and articulated 2,760 students; two-thirds of the agreements were between secondary schools and two-year colleges
- served a student population that was 45 percent nonwhite and 27 percent female
- collaborated with 6,900 groups, receiving \$11 million in monetary contributions and \$9 million worth of in-kind support

This fact sheet summarizes data gathered in the 2010 survey of National Science Foundation (NSF) Advanced Technological Education (ATE) grant recipients. Conducted by Evaluate|t|e, the evaluation resource center for the ATE program located at The Evaluation Center at Western Michigan University, this was the eleventh annual survey of ATE projects and centers. Included here are findings about the program's grantees and their activities, accomplishments, and impacts during the 2009 calendar year.

The 2010 survey was a census of all active ATE program grantees, which included 219 principal investigators (PIs).<sup>2</sup> Survey responses were received from 203 ATE grantees, including 164 projects, 37 ATE centers, and 2 targeted research projects. The survey instrument had six sections. Most survey recipients completed the sections on Grantee Characteristics (93%), Organizational Practices (91%), and Collaboration (86%). New grantees, those who had not completed a full year of project work (n=61), were expected to complete just those first three sections. More than thirty percent of grantees completed the remaining sections on Materials Development (31%), Professional Development (39%), and Program Improvement (41%). Whether grantees completed these sections depended on the nature of their grant work. Grantees who allocated at least \$100,000 or 30 percent of their budgets in 2009 to the activities in question were expected to complete the sections. PIs who did not meet the budget conditions but wanted to report on their work in a given area had the option to do so.

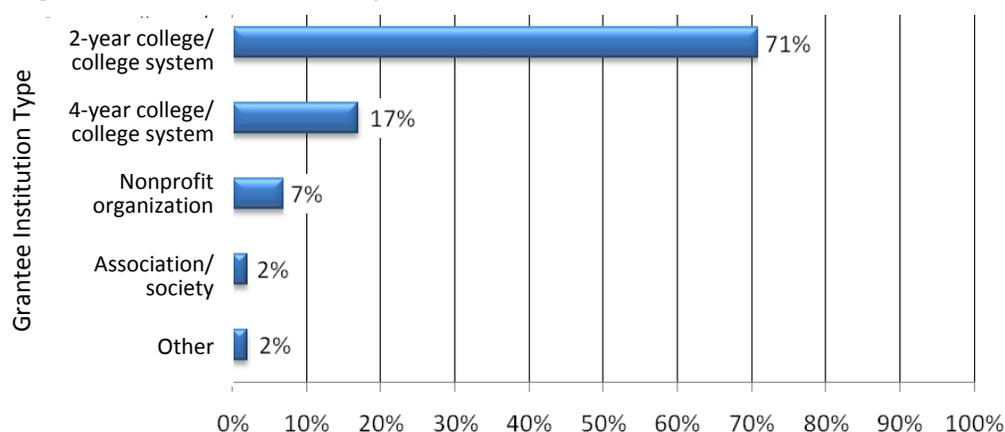
<sup>1</sup> Reported numbers of people (students, professional development participants) throughout this report are rounded to the nearest ten. The 'N' indicated in table and figure titles represents the number of respondents for a given item.

<sup>2</sup> In previous years the survey population included only principal investigators (PIs) for all current ATE projects and centers that had been active for at least one year as of January 1 in the year the survey was conducted.

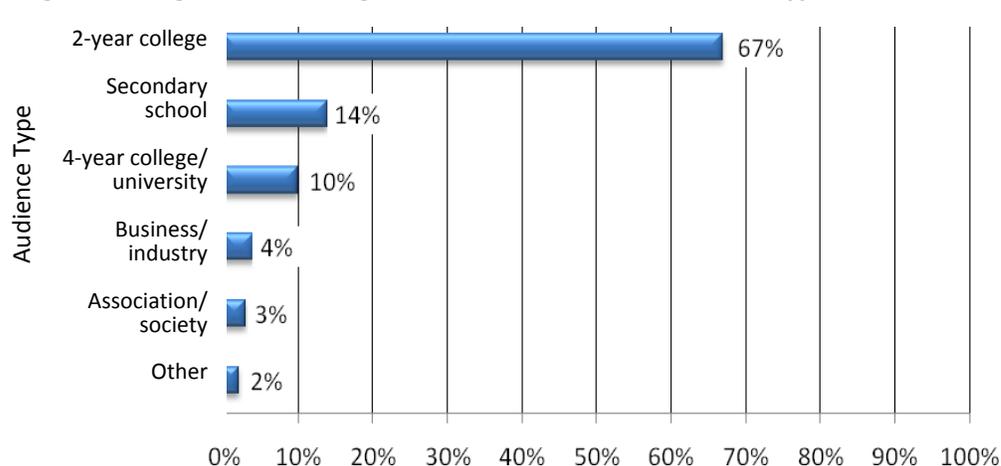
## GRANTEE CHARACTERISTICS

The ATE program was established by NSF in response to the *Scientific and Advanced-Technology Act of 1992*, which was intended “to establish a national advanced technician training program, utilizing the resources of the nation’s two-year associate-degree-granting colleges.”<sup>3</sup> Consistent with that mandate, the ATE program solicitation states that “The ATE program focuses on two-year colleges and expects two-year colleges to have a leadership role in all projects.” As such, one would expect 2-year colleges to figure prominently as both grantees and beneficiaries of ATE activities. The survey findings regarding the types of institutions receiving ATE grants (Figure 1), their use of grant funds to serve different audiences (Figure 2), and other indicators throughout this report show this to be the case.

**Figure 1. 2009 ATE Grant Recipient Institutions (N= 203)**



**Figure 2. Program-wide Budget Allocations to Serve Audience Types (N= 193)**



<sup>3</sup> Public Law 102-476.

The **major emphases of projects and centers** reported by PIs are diverse, with the largest category, information technology, including only 14 percent (n=29) of the respondents. Manufacturing technology accounted for 12 percent (n=25), while bio-related technologies (n=17) and professional development (n=16) each accounted for about 8 percent of grants represented in the survey data. Other major content area emphases were engineering technology (n=13), advanced materials (n=12), student issues (n=12), energy technology (n=10) and environmental technology (n=10), each of which accounted for more than 5 percent of the respondents. Additionally, about 14 percent (n=28) of respondents indicated their focus was on something other than one of the 17 categories listed on the survey form—often in interdisciplinary content areas.

Twenty-nine percent of respondents reported spending grant funds on **targeted research**. Among those who spent money on research, the average was 17 percent of the grant budget. Forty respondents provided detailed descriptions of their research. Research topics included training/instruction or curriculum development to improve student outcomes (n=15); workforce analysis, best practices, and trends documentation (n=9); evaluation, assessment, and standard setting (n=7); developing or implementing new technologies (n=2); employment outcomes (n=2); or other/general research (n=5).

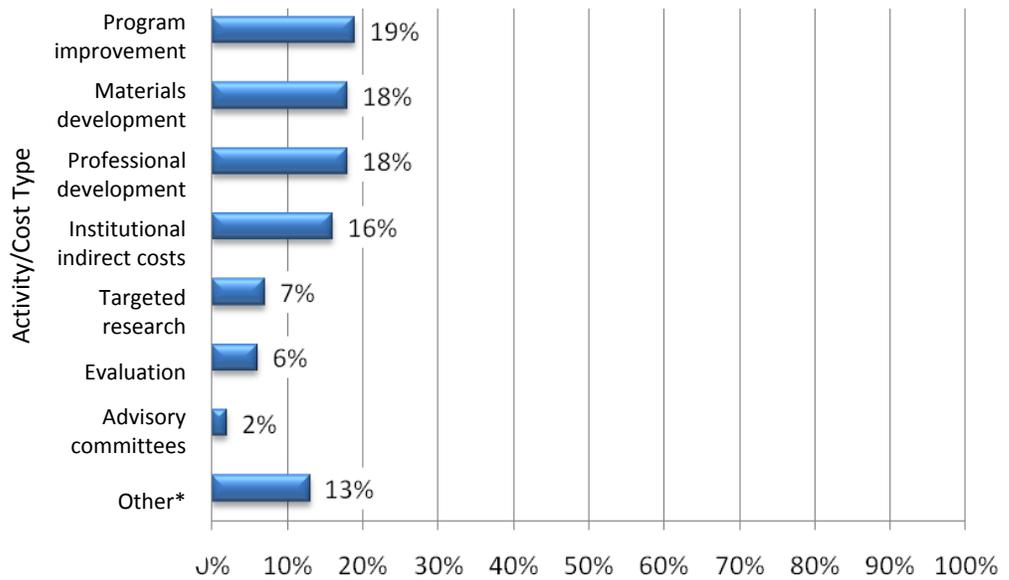
**Articulation agreements** are intended to enable students who complete a program or series of courses to matriculate to a higher level of education at specified institutions. Almost a third (30%) of respondents indicated that developing articulation agreements was part of their project/center activities. Respondents reported that 1,372 agreements were in place in 2009 (two-thirds were between high schools and two-year colleges), which involved 958 institutions and articulated 2,760 students (Table 1).

**Table 1. Articulation Agreements (N=60)**

	<i>Between high schools and 2-year colleges</i>	<i>Between 2-year and 4-year colleges</i>	<i>Total</i>
Number of agreements	916	456	1,372
Number of institutions involved	598	360	958
Number of students that articulated in '09	1,279	1,481	2,760

Looking at the program as a whole, a little more than half of the grant funds went toward program improvement (19%), materials development (18%), and professional development (18%) efforts combined. Seven percent of grant funds was devoted to targeted research, 6 percent to evaluation, and 2 percent to advisory committees (Figure 3).

**Figure 3. Program-wide Budget Allocations for Specific Activities/Costs (N=198)**



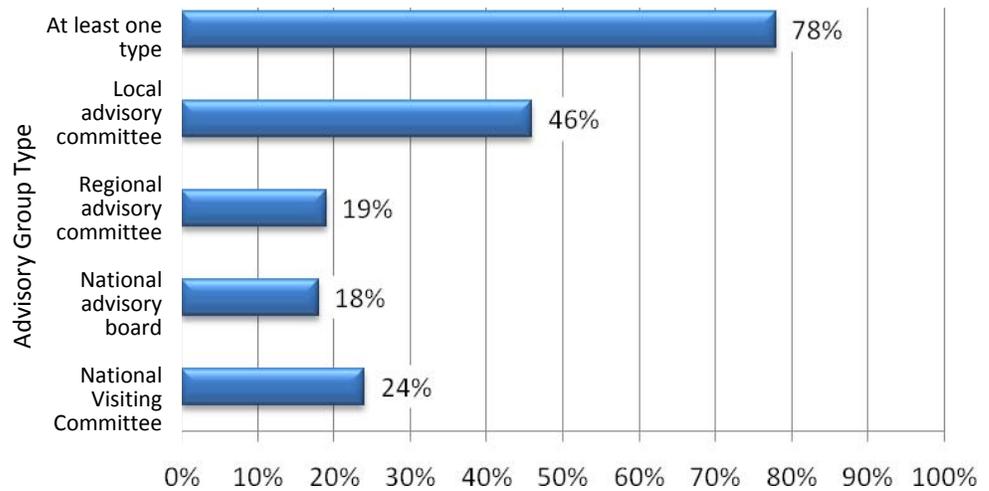
*\*Note: "Other" costs reported by respondents included things like salaries, travel, equipment, outreach, dissemination, marketing, recruitment, administration, and student support. Many of these could/should have been included under the larger categories listed on the survey instrument.*

## ORGANIZATIONAL PRACTICES

The organizational practices survey section focused on activities intended to improve the knowledge base of project and center staff for conducting their grant work. These questions addressed use of workforce needs assessments, advisory committees, grant-level evaluators, and professional development for project/center staff.

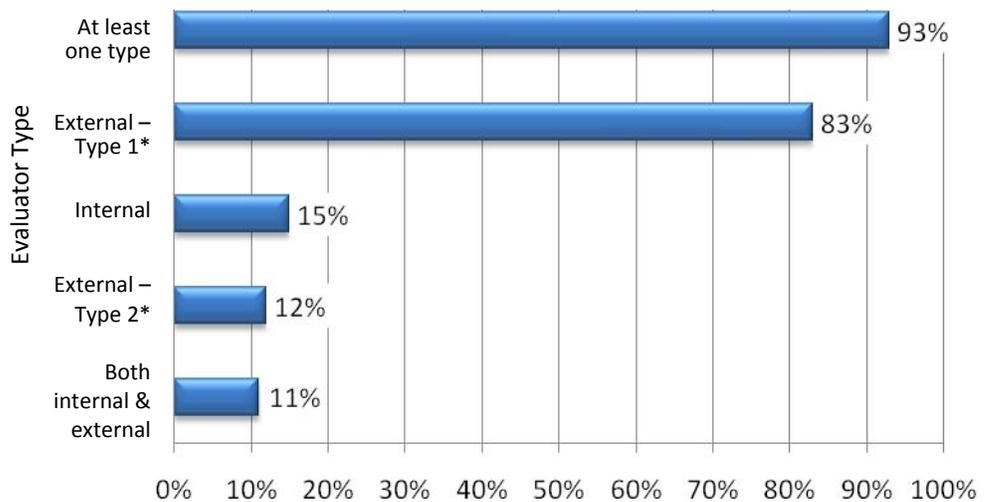
In 2009, most projects and centers supported professional development for their staff (82%) and had an evaluator (93%). Close to one-third (31%) conducted a workforce needs assessment. More than three-fourths (78%) of respondents indicated they used at least one type of **advisory group** in 2009, and almost half (46%) engaged a locally-based committee (Figure 4). Note that a National Visiting Committee is a special type of committee that guides the work of centers and reports to NSF. NVCs are required for all ATE-funded centers.

**Figure 4. 2009 ATE Grantees' Use of Advisory Groups (N=200)**



Most respondents (85%) reported some expenditure on **evaluation** in 2009. Among those at spent money on evaluation, the average allocation was 8 percent. Ninety-three percent of PIs reported that they used an evaluator in 2009. Most respondents reported using evaluators that were external to both the grant and the institution (83%); 15 percent of respondents indicated they had an internal evaluator (Figure 5) (5 percent of respondents indicated an internal evaluator as their only evaluator). Some projects engaged more than one type of evaluator.

**Figure 5. 2009 ATE Grantees' Use of Evaluators (N=200)**



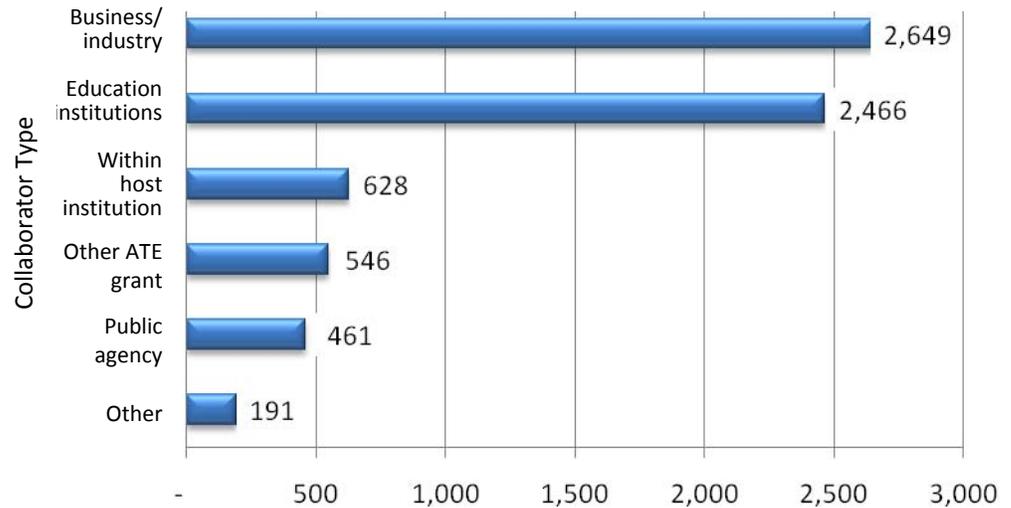
*\*Note: Type 1 external evaluator = external to both institution and grant; Type 2 external evaluator = external to grant, but internal to institution.*

## COLLABORATION

The survey form described collaboration as, “a project/center relationship with another institution, business, or group that involved the collaborator’s

contribution of money or in-kind support to an ATE grant.” Respondents reported almost 7,000 collaborations, which collectively added \$20 million to the ATE program—\$11 million in monetary support and \$9 million in-kind. Business/industry and educational institutions were the most common types of collaborator, comprising almost three-fourths of all ATE collaborators (Figure 6).

**Figure 6. Number of ATE Collaborators in 2009 (N=189)**



## MATERIALS DEVELOPMENT

By completing this section of the survey, 68 PIs (31% of the survey recipients) indicated that they were significantly involved in developing curriculum and educational materials for national dissemination. Of this group, 44 reported that they allocated at least 30 percent of their direct costs or at least \$100,000 to materials development in 2009; the remainder indicated that they did not meet this threshold but wanted to report on their work in this area anyway.

In total, 1,740 materials were reported, of which 961 materials were drafted and/or field-tested in 2009, and 779 were completed. Of the materials completed, 37 percent were reported in use outside of the home and partner institutions. Seven of the reported materials were published commercially, which is less than 1 percent of the materials completed in 2009.

Materials addressed here are various media (textbooks, laboratory experiments and manuals, software, CD-ROMs, videos, or other courseware) used to convey the content and instruction of courses, modules, and activities. These were defined as follows:

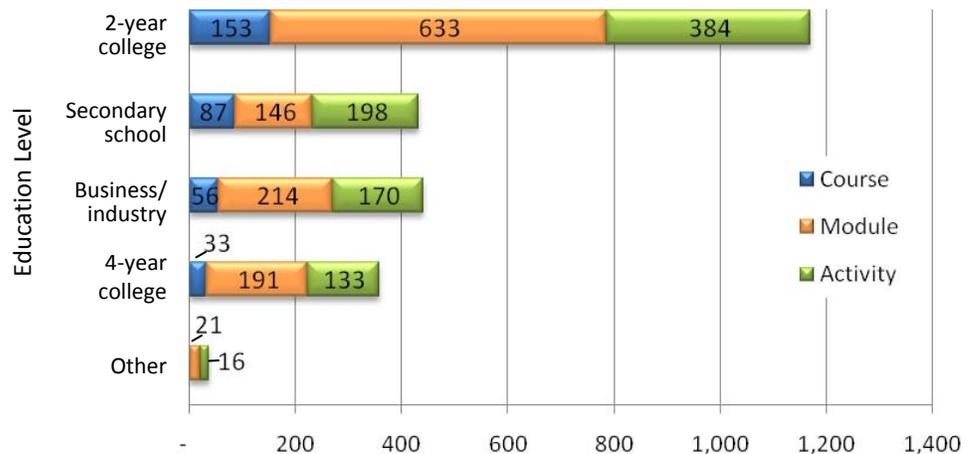
**Course:** A stand-alone collection of instructional content and activities to achieve some desired educational outcomes. Courses usually last a semester or a year.

**Module:** A self-contained collection of content and activities designed to achieve a set of specific objectives. Modules are generally shorter than courses and focus on fewer outcomes.

**Activity:** An instructional exercise, such as a laboratory experiment or test, designed to achieve a discrete learning outcome.

PIs were asked to indicate which education levels their materials were developed to serve. Their responses indicate that a large proportion of materials were intended to serve multiple levels (evidenced by the fact that the sum of the materials reported by education level exceeds the total number of materials developed in 2009). Figure 7—which indicates the number of developed courses, modules, and activities that serve the different education levels—reflects a strong focus on the two-year college level.

**Figure 7. Education Level Served by Materials Developed in 2009 (N=68)**

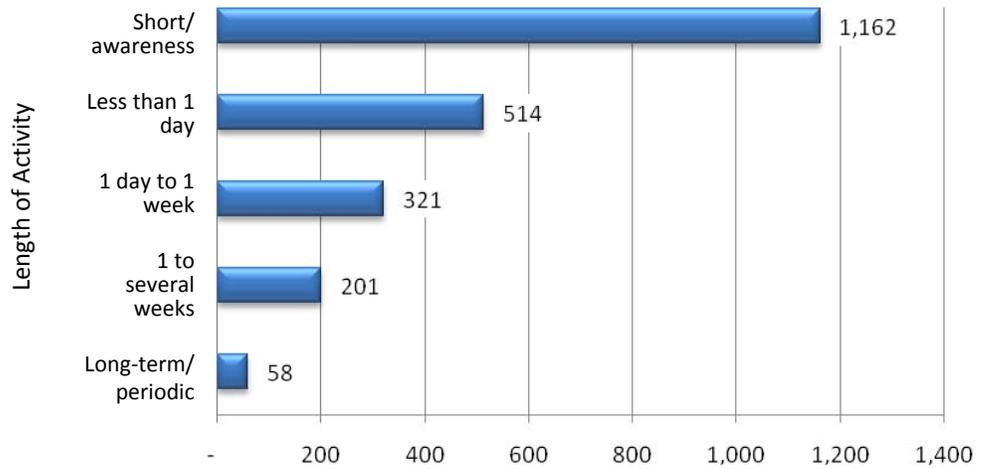


## PROFESSIONAL DEVELOPMENT

By completing this section of the survey, 81 PIs (37% of the survey recipients) indicated that they were significantly involved in providing professional development in 2009. Of this group, 63 reported that they allocated at least 30 percent of their direct costs or at least \$100,000 to materials development in 2009; the remainder indicated that they did not meet this threshold, but wanted to report on their work in this area anyway.

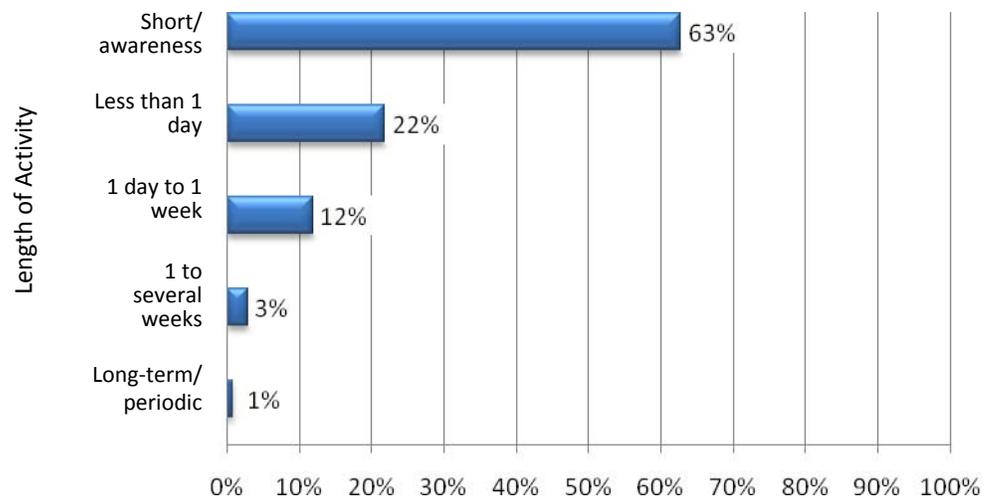
These respondents reported that they provided 2,256 professional development activities in 2009, in which 58,100 people participated. These activities ranged in length from short presentations, intended primarily to raise awareness, up to long-term periodic instructional activities, including internships or peer coaching. More than half the activities were short presentations to raise awareness (52%). About one-quarter (26%) of the activities lasted at least one full day. Figure 8 shows the number of activities of each length that were offered in 2009.

**Figure 8. Number of ATE Professional Development Activities in 2009 by Length (N=79)**



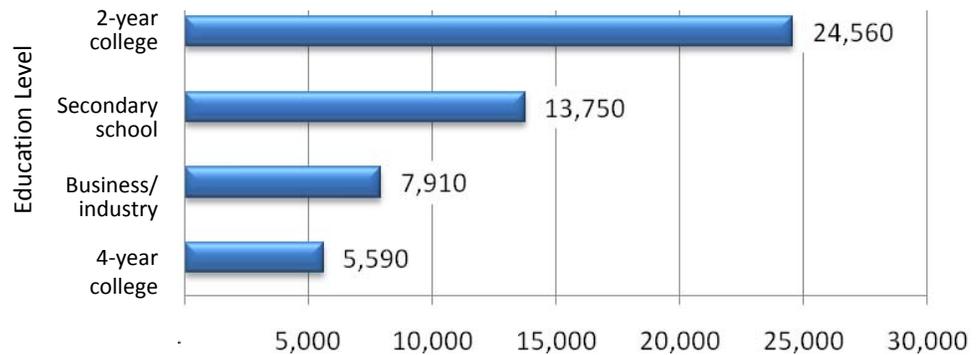
Almost two-thirds (63%) of the participants in ATE professional development activities were involved in short presentations to raise awareness. Sixteen percent of all participants were engaged in activities lasting at least one day (Figure 9).

**Figure 9. Percentage of ATE Professional Development Participants across Activities of Different Lengths (N=81)**



About half of the professional development participants (47%) were from two-year colleges, 27 percent were from secondary schools, 15 percent were from business and industry, and the rest (11%) were from four-year colleges. Figure 10 shows the number of participants from each education level.

**Figure 10. Number of Participants in ATE Professional Development by Education Level (N=77)**



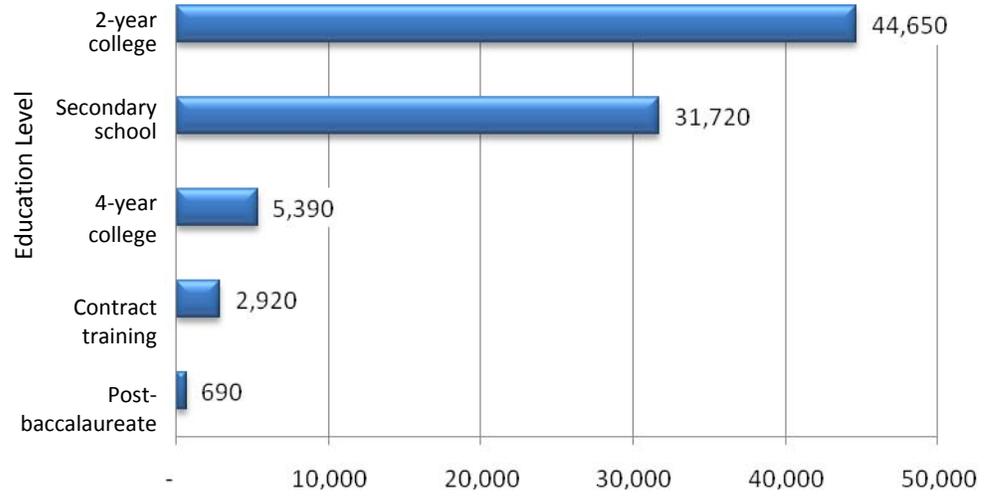
### **ATE-SUPPORTED INSTRUCTION AND PROGRAM DEVELOPMENT/IMPROVEMENT**

The survey instrument defined a program as a sequence of courses, laboratories, and/or work-based experiences that lead students to a degree, certification, or occupational competency point.

This survey year marked a major change in the survey's organization. Section 1 of the survey now includes a subsection where all grantees are invited to report on instruction of students. Slightly more than half of all ATE respondents (n=109) completed these questions on student enrollments (90 of these indicated elsewhere that program improvement was a significant focus of their work). Findings from those responses are provided here first, followed by findings from responses to Section 6, where respondents significantly engaged in program improvement and development provided additional details about their work in this area and its evaluation.

PIs were asked to report the total number of individual students who took at least one course in one of their ATE-supported programs in 2009. Responding PIs reported that their ATE funds supported the instruction of 85,300 students. A little more than half (52%) of the students were enrolled at the two-year level (Figure 10).

**Figure 10. Number of Students in ATE-Supported Courses in 2009 by Education Level (N=109)**



The locations where ATE-supported programs were offered included most two-year colleges (47%) and secondary schools (42%) (Figure 11).

**Figure 11. Percentage of ATE-Supported Program Locations at each Education Level (N=109)**

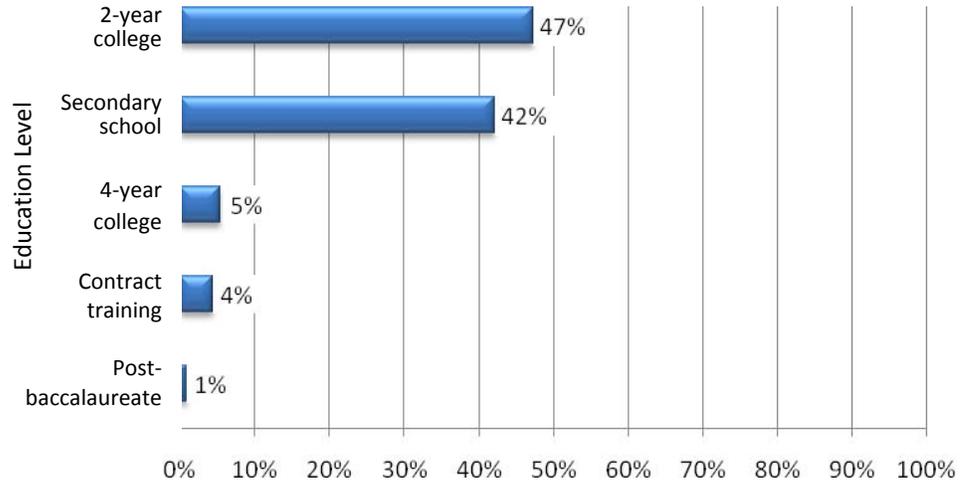


Table 2 presents PIs' estimates of the demographic makeup of their unique student participants—persons who had taken at least one ATE course in 2009. According to the numbers reported, almost half of the students (45%) were nonwhite; a little more than one-fourth (27%) were female.

**Table 2. Demographic Characteristics of ATE Students**

<i>Demographic Characteristic</i>	<i>Number</i>	<i>Percentage of category</i>
<b>Gender (N=105)</b>		
Male	53,700	73%
Female	19,950	27%
<b>Race/ethnicity (N=101)</b>		
Hispanic/Latino	13,530	19%
American Indian/Alaska Native	580	1%
Asian	4,330	6%
Black/African American	9,850	14%
Native Hawaiian/Pacific Islander	970	1%
Multiracial	2,610	4%
White	37,700	55%
Students requesting accommodation under the Americans with Disabilities Act (N=30)	780	-

Ninety (41% of all survey recipients) completed the survey's program improvement section. Of this group, 63 reported that they allocated at least 30 percent of their direct costs or at least \$100,000 to program improvement in 2009; the remainder indicated that they did not meet this threshold but wanted to report on their work in this area anyway. This group of 90 respondents reported that they offered nearly 800 programs and 1,330 courses that were supported with ATE funds in 2009. Because 109 grantees indicated in Section 1 that they provided ATE-supported instruction, these numbers are an underestimate of the total number of programs and courses that are supported by ATE. A majority of the programs (72%) and courses (88%) were provided at the two-year level.

## **FORTHCOMING REPORTS**

ATE Survey Fact Sheets released in 2009 and 2008 included a brief analysis of multi-year trends. This year marked a significant change in the survey questions and organization, complicating comparisons across years. We are working on trend reports that span the life of the annual ATE survey (2000-10), focusing on topics of special interest. Additionally, data snapshots are being developed to highlight findings from certain sections of the survey in more detail. Look for these trend and snapshot reports at [www.evaluate-ate.org](http://www.evaluate-ate.org), where you can also find an array of reports on the ATE program dating back to 2000.