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Corey Smith, Lori Wingate, & Arlen Gullickson

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## Highlights

In 2013, National Science Foundation-funded Advanced Technological Education projects and centers

- educated approximately 109,550 students—52 percent of whom were at two-year colleges and 41 percent at secondary schools.<sup>1</sup>
- offered programs at about 2,380 educational institutions across the country.
- developed 2,580 curriculum materials, 18 percent of which were full courses and 3 percent were published commercially.
- offered more than 3,270 professional development opportunities, which served more than 80,030 educators—roughly 45 percent of whom were two-year college faculty and 43 percent secondary school teachers.
- had approximately 1,460 articulation agreements in place, and developed 200 agreements in 2013; these agreements helped about 2,530 students matriculate between high school and two-year institutions and 2,700 students between two-year and four-year institutions.
- served a student population that was 51 percent minority and 26 percent female.
- collaborated with more than 10,240 groups that provided more than \$12 million in monetary contributions and \$13 million in-kind support.

This fact sheet summarizes data gathered in the 2014 survey of National Science Foundation (NSF) Advanced Technological Education (ATE) grant recipients. Conducted by EvaluATE, the evaluation resource center for the ATE program located at The Evaluation Center at Western Michigan University, this was the fifteenth annual survey of ATE projects and centers. Included here are findings about the program's grantees and their activities, accomplishments, and impacts during the 2013 calendar year.

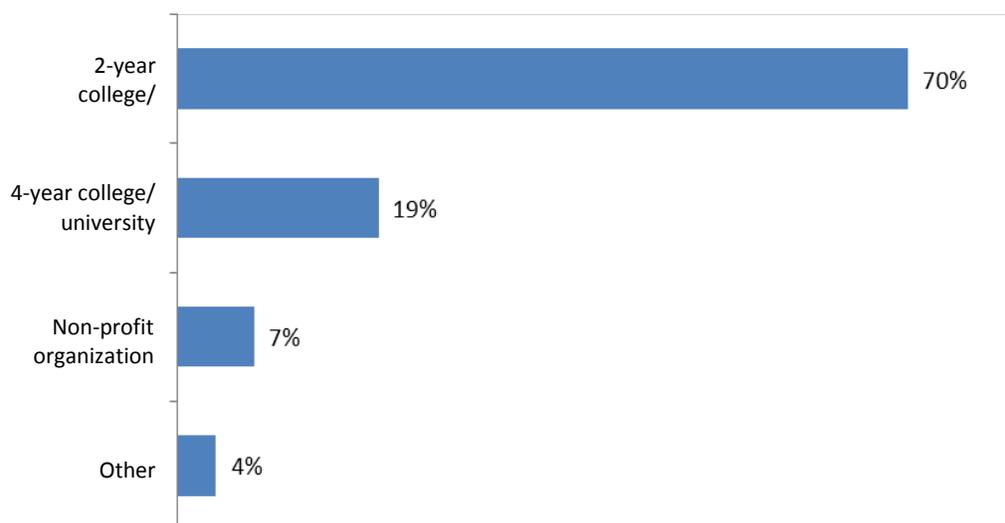
The 2014 survey was a census of active ATE principal investigators (PIs) (N=240). Survey responses were received from 221 grantees (92%), including 177 projects, 38 centers, and 6 targeted research projects. Most survey recipients completed the sections on Grantee Characteristics and Practices (91%) and Special Topics (62%). About half of the survey recipients completed the sections on Materials Development (46%), Professional Development (53%), and Program Improvement (45%). Whether grantees completed those sections depended on the nature of their grant work—that is, those who allocated at least \$100,000 or 30 percent of their budgets in 2013 to the activities in question were expected to complete the relevant sections. PIs who spent less had the option to complete each section.

<sup>1</sup> Reported numbers of participants, products, and activities 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.

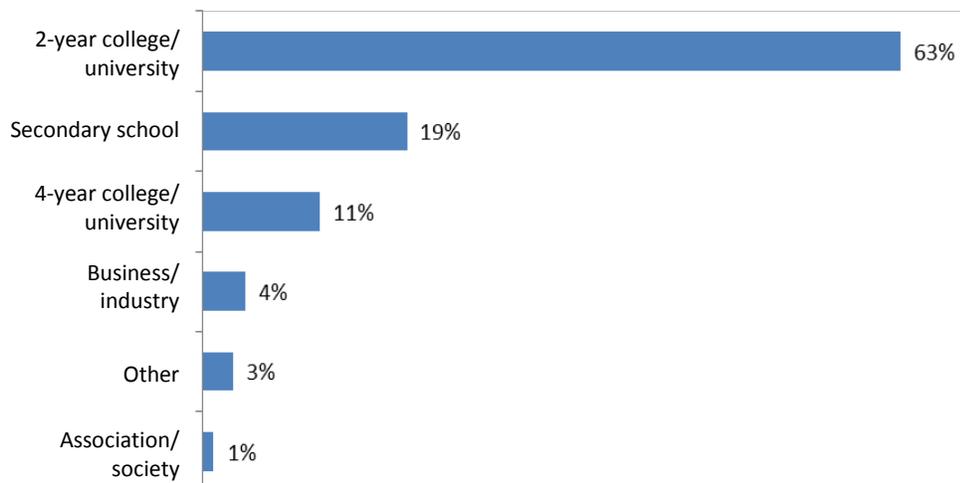
## Grantee Characteristics and Practices

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>2</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.” Accordingly, two-year colleges figure prominently in the program, as both grantees (Figure 1) and beneficiaries (Figure 2) of grant-supported activities. Fund allocations shown in Figure 2 include support for both students and faculty.

**Figure 1. ATE Grant Recipient Institutions (N=220)**



**Figure 2. Grantee-Reported Budget Allocations to Serve Audience Types (N=212)**



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<sup>2</sup> Public Law 102-476.

The content-area emphases of ATE grantees are diverse, as shown in Table 1. Despite this, the top four content areas accounted for 59 percent of the grantees. All percentages are within 3 percent of the amounts reported on last year's survey.<sup>3</sup> Agricultural and environmental technologies saw the largest drop from 2012, particularly in the actual number of grantees reporting this emphasis. The drop can be explained by a considerable number of respondents who changed their reported emphasis in 2013 from that which they reported in 2012.

**Table 1. Reported Content-Area Emphases (N=219)**

<i>Content area</i>	<i>Number of grantees</i>	<i>Percent of grantees</i>
Information, geospatial, and security technologies	33	15%
Agricultural and environmental technologies	32	15%
Other*	32	15%
Advanced manufacturing technologies	30	14%
Biotechnology and chemical processes	19	9%
Learning, evaluation, and research	19	9%
Engineering technologies	18	8%
Recruitment	12	5%
Technology teacher preparation	11	5%
Micro and nanotechnologies	10	5%
Core courses	3	1%

\* Most respondents who selected "other" reported interdisciplinary or multidisciplinary foci.

Approximately 60 percent of budgeted funds were devoted directly to professional development, materials development, program improvement, and targeted research. Allocations to the first three were roughly equal, but overall projects and centers spent much less on targeted research. The lower expenditure for targeted research is explained in part by the smaller percentage of projects that engaged in this activity.

Twenty-eight percent of respondents (n=62) reported spending grant funds on **targeted research**. Within this group of grantees, the average budget allocation for research was 20 percent.<sup>4</sup> Budgeted funds for evaluation and advisory committee support combined, amount to 10 percent across all projects and centers.

<sup>3</sup> See the 2013 ATE Survey Fact Sheet at [evalu-ate.org/annual\\_survey/reports](http://evalu-ate.org/annual_survey/reports).

<sup>4</sup> In 2010, we asked survey respondents to describe the focus of their research activities. At that time, research topics included instruction or curriculum development to improve student outcomes; workforce analysis, best practices, and trends documentation; evaluation, assessment, and standard setting; developing or implementing new technology; employment outcomes; and other issues. For more information, see the brief on ATE targeted research at [evalu-ate.org/annual\\_survey/reports](http://evalu-ate.org/annual_survey/reports).

**Figure 3. Grantee-Reported Budget Allocations for Specific Activities/Costs (N=213)**



*\*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 form.*

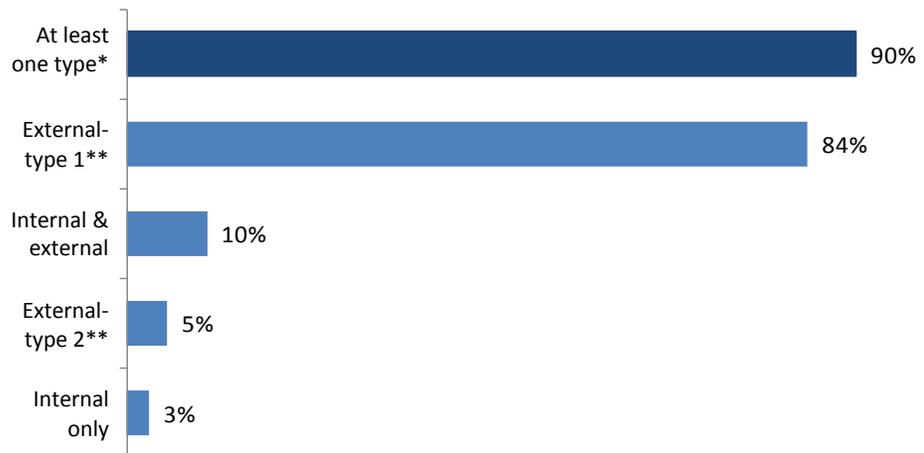
Most respondents (83%) reported some expenditure on **evaluation** in 2013.<sup>5</sup> Within this group, the average budget allocation was 8 percent. This average expenditure has remained consistent since 2010, indicating ongoing budgetary support for evaluation services.

An even larger percentage of projects and centers reported having an evaluator (90%). Figure 4 shows most respondents reported using evaluators that were external to both the grant and the institution (84%). The use of an external evaluator increased 7 percent from 2013. Additionally 13 percent of respondents indicated they had an internal evaluator working alone or in conjunction with an external evaluator.

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<sup>5</sup> Not all grantees who reported having an evaluator also reported expenditure on evaluation in 2013. Aside from missing data, possible causes for this discrepancy may be that some new grants had not yet paid for any evaluation services and/or that the compensation for internal evaluators was not reported under Evaluation on the question about budget allocations.

**Figure 4. 2013 ATE Grantees' Use of Evaluators (N=212)**



\* Note: This bar is not a complete sum of the four bars below it because some grantees reported having an evaluator, but did not indicate what type of evaluator they had.

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

**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. Forty-four percent of respondents indicated that developing articulation agreements was part of their project/center activities; 34 percent provided additional information on these agreements. The program totals for 2013 are shown in Table 2. A majority (59%) of these agreements were between high schools and two-year colleges.

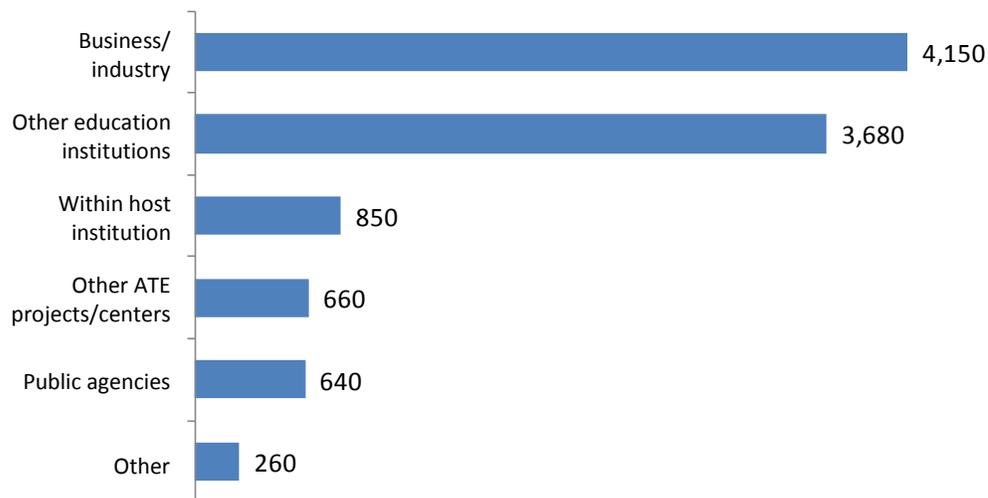
**Table 2. Articulation Agreements in 2013 (N=76)**

	<i>Between high schools and 2-year colleges</i>	<i>Between 2-year and 4-year colleges</i>	<i>Total</i>
Agreements developed	140	60	200
Agreements in place	860	590	1,450
Institutions involved	690	500	1,190
Students that matriculated	2,530	2,700	5,230

The survey's questions about **collaboration** were accompanied by a definition of this term, describing it as "a project/center's relationship with another institution, business, or group that provides money or other support to your project or center. Collaborators are not funded by the grant." Respondents reported 10,240 collaborating organizations, which collectively added \$25 million to the ATE program—\$12 million in monetary support and \$13 million in-kind. The median number of collaborations reported was 17. The median amount of monetary support reported by grantees was \$26,250.

The totals for both the number of collaborations and the amount of monetary support were greatly impacted by just a few grants. Three grants accounted for 23 percent of the total number of reported collaborations<sup>6</sup>. Furthermore, two grants accounted for 38 percent of the total monetary support reported by grantees. Business/industry and educational institutions were the most common types of collaborators, comprising more than three-quarters of all collaborating organizations (Figure 5).

**Figure 5. Number of ATE Collaborating Organizations (N=198)**



## Materials Development

By completing this section of the survey, 103 PIs (43% of all survey recipients) indicated that they were significantly involved in developing curriculum and educational materials for national dissemination. Of those who responded to this section, 53 percent reported that they allocated at least 30 percent of their direct costs or \$100,000 to materials development in 2013; the remainder indicated that they did not meet this threshold but chose to report on their work in this area because they viewed their materials development efforts as significant.

Materials addressed included various media (textbooks, laboratory experiments and manuals, software, videos, or other courseware) used to convey the content and instruction of courses, modules, and activities, 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.

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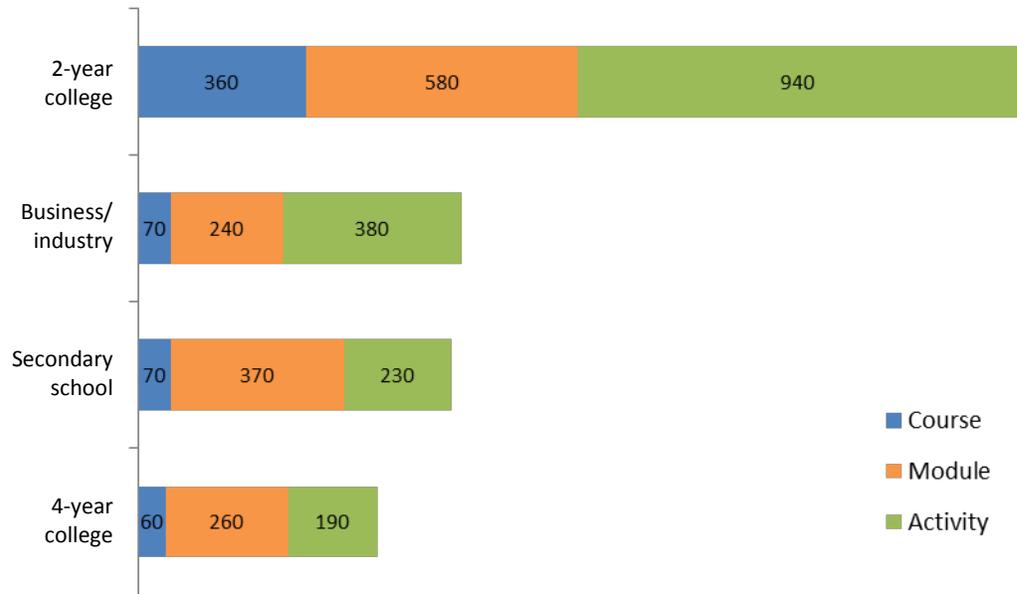
<sup>6</sup> We followed up with these three grantees to understand the nature of these large scale collaborations. The collaborations center on events such as student competitions, workshops, partnership meetings and consultations.

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

In total, 2,580 materials were reported, of which 990 were in draft and/or field-test stage in 2013 and 1,520 had been completed. Of the materials completed, 30 percent were reported to be in use outside of the grantee’s home and partner institutions. Three percent (69) were published commercially in 2013. This publication rate is consistent with 2012 (2%) but has dropped substantially from reported values in 2010 (25%) and 2011 (10%).<sup>7</sup>

Figure 6, which indicates the number of developed courses, modules, and activities for different education levels, depicts a strong focus on the two-year college level. In addition to the materials included in Figure 6, 53 materials were reported for the “other” education level category, including four courses, 26 modules, and 27 activities. The sum of the materials reported by education level (3,750) exceeds the total number of materials developed by 1,170, suggesting that a large proportion of materials were intended to serve multiple levels.

**Figure 6. Education Levels Served by Materials Developed (N=98)**



<sup>7</sup> Because the materials reported in this section include those developed or completed in 2013 only, we are not capturing publication of materials developed in prior years.

## Professional Development

By completing this section of the survey, 117 PIs (49% of survey recipients) indicated that they were significantly involved in providing professional development in 2013. Of this group, 44 percent reported that they allocated at least 30 percent of their direct costs or at least \$100,000 to professional development in 2013; the rest indicated they did not meet either threshold, but reported on their professional development because of its significance to their project or center.

These respondents reported providing 3,270 professional development activities in 2013, ranging from short presentations intended primarily to raise awareness to long-term periodic instructional activities (e.g., internships or peer coaching). A total of 80,030 individuals participated in these ATE-supported professional development activities. As the length of the professional development activity increased, the numbers of activities conducted and participants engaged in those activities dropped off substantially.

Figure 7 shows the number of professional development **activities** of each length that were offered in 2013.<sup>8</sup> Figure 8 parallels Figure 7 and shows the number of **participants** in each type of activity.

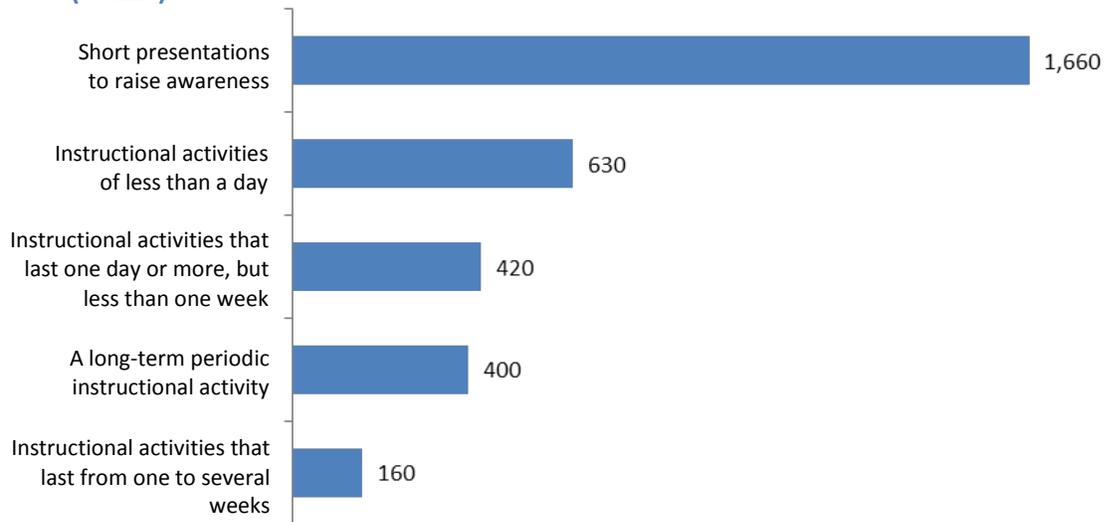
A little more than half (51%) of the professional development activities were short presentations to raise awareness and engaged a majority (63%) of the participants. Twenty-nine percent of the professional development activities lasted a day or more; these activities engaged 17 percent of all participants.

The number of long-term activities (i.e., one or more weeks in length) increased by more than a third from 2012 to 2013 (up to 400 from 280). For these long-term instructional activities, 60 percent of participants received some form of follow-up.

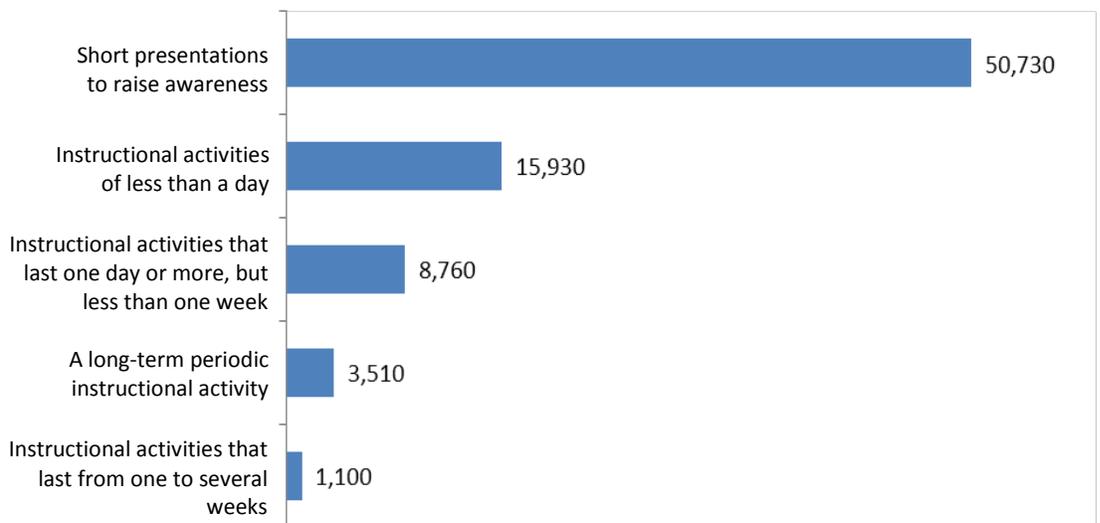
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<sup>8</sup> See the 2011 ATE Survey Fact Sheet at [evalu-ate.org/annual\\_survey/reports](http://evalu-ate.org/annual_survey/reports).

**Figure 7. Number of ATE Professional Development Activities by Length (N=120)**



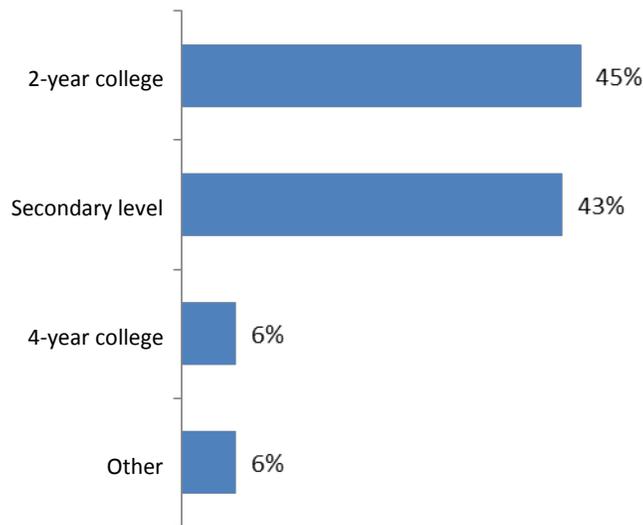
**Figure 8. Number of ATE Professional Development Participants across Activities of Different Lengths (N=115)**



The number of professional development participants reported by education level increased from 60,300 participants in 2012 to 65,940 participants in 2013. As Figure 9 shows, most participants were from two-year colleges or secondary schools with approximately equal numbers from both groups. The number of participants from four-year colleges in 2013 was much lower declining to six percent from 15 percent in 2012. This shift coincides with an increase in the percentage of participants from the secondary level.<sup>9</sup>

<sup>9</sup> The discrepancy in total participant counts between Figures 8 and 9 is a result of missing data (questions about the total number of participants and the breakdown by education level were asked in separate items on the survey form). Fewer respondents reported participant data by education level than total participant counts.

**Figure 9. Percentage of ATE Professional Development Participants by Education Level (N=111)**



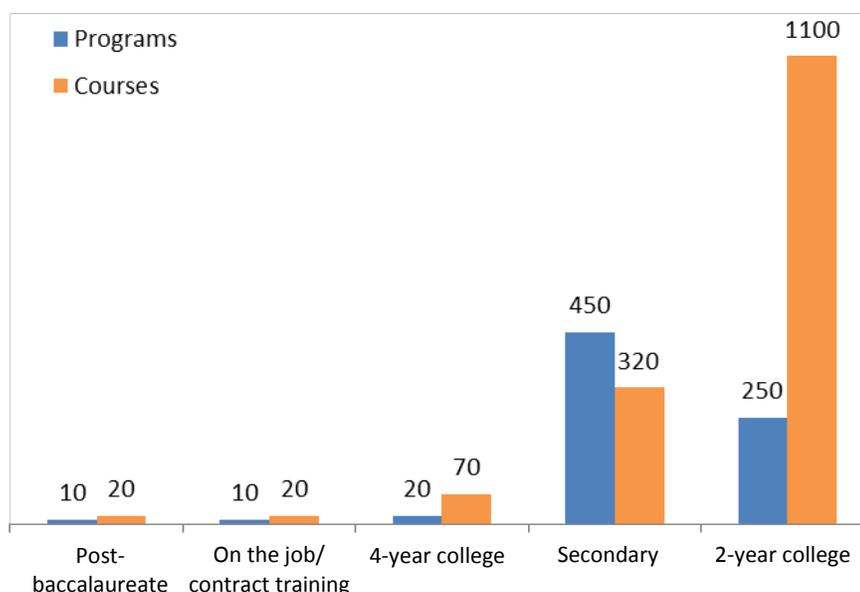
## Program Development/Improvement

Survey questions about program development and improvement were preceded by a definition of a program as “a sequence of courses, laboratories, and/or work-based experiences that lead students to a degree, certification, or occupational competency point.” Here we report findings about ATE-supported **programs** and **courses**, as well as the **students** enrolled in them.

Fifty two percent of survey recipients (n=125) completed the Program Improvement section, which includes questions about courses and programs developed or modified with grant funds. Of this group, 68 (54%) reported that they allocated at least 30 percent of their direct costs or at least \$100,000 to program improvement in 2013; the remainder indicated that they did not meet this threshold but viewed their program development efforts as substantial and chose to report on their work in this area. Respondents to this section include 109 of the 139 PIs (78%) who indicated that their projects or centers provided ATE-supported instruction.

Collectively, the respondents in this section reported that they offered 740 programs and 1,530 courses with ATE support in 2013. A majority of the courses (72%) were developed for the two-year college level (Figure 10). Because more grantees indicated that they provided ATE-supported instruction than completed the program improvement section the course and program totals likely underestimate the total numbers supported by ATE.

**Figure 10. Number of ATE-Supported Programs and Courses by Education Level (N=109)**



Respondents were asked to report the number of **locations** by education level where ATE-supported programs were offered. The number of reported locations increased from 2,240 in 2012 to 2,380 in 2013. Of these 2,380 locations, most were at secondary schools (63%) and two-year colleges (26%). These data indicate the continuation of a trend where more programs are being offered at secondary school locations, whereas prior to 2011, more programs were being offered at two-year college locations.

The high proportion of programs offered at secondary schools is largely due to two grants. Those two grants are responsible for 66 percent of the reported secondary-level locations. The actual number of projects engaged in offering programs strongly favors community colleges, outnumbering those offering secondary programming by almost two to one. One hundred and ten respondents reported providing programs at two-year colleges compared to 66 who reported providing programs at secondary schools

Table 3 presents **student demographic** findings. It also compares the ATE numbers with U.S. population statistics. More than half of the students (51%) were from racial/ethnic minorities, and a little more than one fourth (26%) were female. These numbers represent an increase from last year's survey. They also mark the first year, since 2009, that non-white students make up the majority of the students reported. Participation by women continues to be well below their representation in the U.S. population.

Inconsistency between the total number of students reported (in Figure 11 and related discussion) and the sums of subgroups (Table 3) can be attributed to

some PIs not reporting demographic data (student demographics data were gathered via a separate question from total enrollments).

**Table 3. Demographic Characteristics of ATE Students**

<i>Demographic Characteristic</i>	<i>Number</i>	<i>Percentage of category</i>	<i>Percent of U.S. population</i>
<b>Gender (N=108)</b>			
Male	76,120	74%	49%
Female	26,960	26%	51%
<b>Race/ethnicity (N=100)*</b>			
Hispanic/Latino	17,630	19%	17%
American Indian/Alaska Native	1,150	1%	1%
Asian	5,050	5%	5%
Black/African American	20,000	21%	13%
Native Hawaiian/Pacific Islander	770	1%	0.2%
Multiracial	2,810	3%	2%
White	45,990	49%	63%
<b>Students requesting accommodation under the Americans with Disabilities Act (N=29)</b>	4,670	-	-

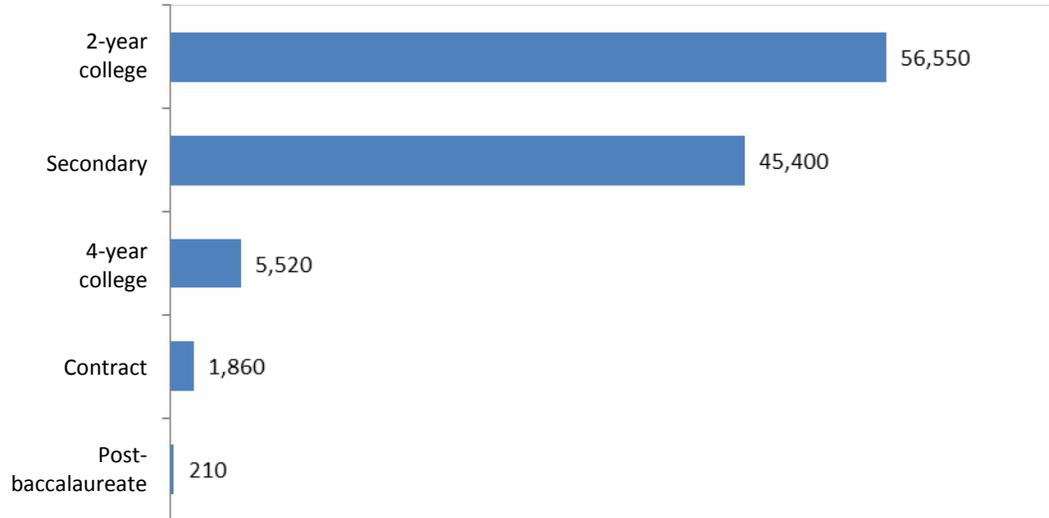
† Source: <http://quickfacts.census.gov/qfd/states/00000.html>

\*Hispanic origin is not a race, and persons of Hispanic origin may be of any race.

All 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 2013. Slightly more than half (53%) of all ATE respondents (N=117) completed these questions on student enrollments. Given that 169 grantees indicated they spent some portion of their ATE budgets on program improvement, it is likely that the number of students reported is an underestimate of the ATE program’s reach.

Responding PIs reported that their ATE funds supported the instruction of 109,550 students, with 52 percent enrolled at two-year colleges and 41 percent at secondary schools (Figure 11).

**Figure 11. Number of Students in ATE-Supported Courses by Education Level (N=117)**



## Other ATE Survey Reports

Additional reports based on annual ATE survey data, dating back to 2000, are available at [evalu-ate.org/annual\\_survey/reports](http://evalu-ate.org/annual_survey/reports).

Custom reports may be developed upon request. For more information, contact [corey.d.smith@wmich.edu](mailto:corey.d.smith@wmich.edu).