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Advanced Technological Education Survey 2012 Fact Sheet

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Highlights

In 2011, the National Science Foundation's Advanced Technological Education projects and centers

- educated approximately 80,300 students—47 percent of whom were at two-year colleges and 43 percent at secondary schools[1].
- offered programs at approximately 1,720 educational institutions across the country.
- developed 2,420 curriculum materials, 14 percent of which were full courses and 10 percent of which were published commercially.
- offered more than 2,660 professional development opportunities, which served more than 71,810 educators—roughly 48 percent of whom were two-year college faculty and 37 percent secondary school teachers.
- had approximately 980 articulation agreements in place, 16 percent of which were developed in 2011 and helped more than 2,930 students matriculate mostly between two-and four-year institutions.
- served a student population that was 42 percent minority and 22 percent female.
- collaborated with more than 9,730 groups that provided more than $8 million in monetary contributions and $12 million worth of in-kind support.

This fact sheet summarizes data gathered in the 2012 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 thirteenth annual survey of ATE projects and centers. Included here are findings about the program's grantees and their activities, accomplishments, and impacts during the 2011 calendar year.

The 2012 survey was a census of active ATE program grantees (N=250 principal investigators). Survey responses were received from 230 grantees (92%), including 180 projects, 43 centers, and 7 targeted research projects. Most survey recipients completed the sections on Grantee Characteristics and Practices (92%) and Special Topics (89%). More than 35 percent of survey recipients completed the sections on Materials Development (39%), Professional Development (46%), and Program Improvement (44%). Whether grantees completed those sections depended on the nature of their grant work. Those who allocated at least $100,000 or 30 percent of their budgets in 2011 to the activities in question were expected to complete the relevant sections. PIs who spent less had the option to complete each section.

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[1] 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."[2] 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 and beneficiaries of grant-supported activities. Seventy percent of ATE grant recipients are located at two-year colleges (Figure 1). Cumulatively, grantees reported spending 62 percent of program funds to serve students and faculty at two-year colleges (Figure 2).

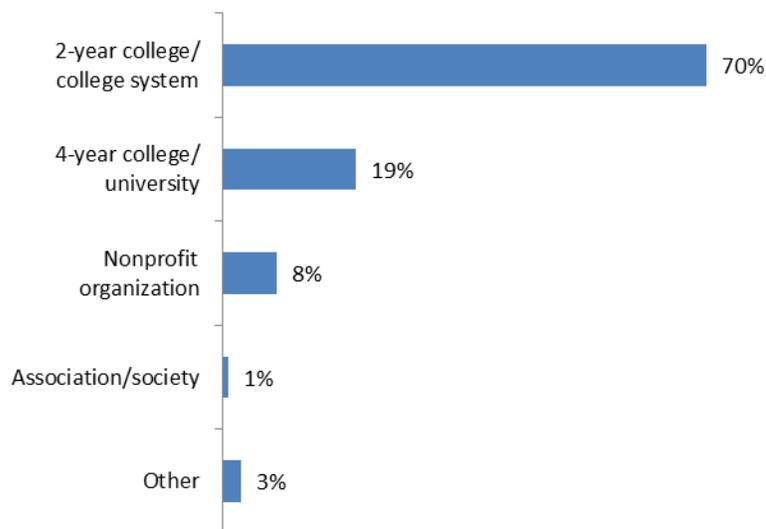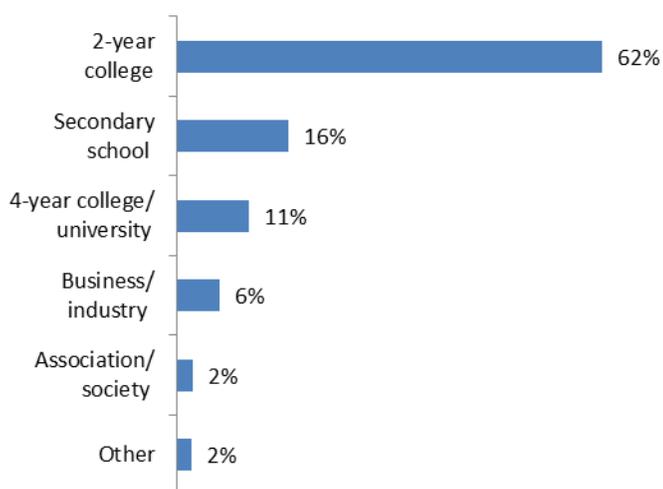**Figure 1. 2011 ATE Grant Recipient Institutions (N=230)**

2-year college/college system	70%
4-year college/university	19%
Nonprofit organization	8%
Association/society	1%
Other	3%

Figure 2. Grantee Reported Budget Allocations to Serve Audience Types (N=224)

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2-year college	62%
Secondary school	16%
4-year college/university	11%
Business/industry	6%
Association/society	2%
Other	2%

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[2] Public Law 102-476.

The disciplinary or content-area emphases of projects and centers reported by PIs (N=228) are diverse, with the largest category—information, geospatial, and security technologies—including only about 16 percent (n=35) of the respondents. Agricultural, energy, and environmental technologies accounted for 13 percent (n=29), while advanced manufacturing technologies accounted for 11 percent (n=25), and biotechnology and chemical processes for 10 percent (n=23). Learning, evaluation, and research (n=19) accounted for 8 percent while engineering technologies (n=16) accounted for 7 percent. Other major content area emphases accounted for 5 percent or less of respondents. These included electronic, micro, and nanotechnologies (n=12); recruitment (n=10); core courses (n=8); and technology teacher preparation (n=7). Additionally, a large number, about 19 percent (n=44), of respondents selected the "other" category. Respondents who selected other generally conveyed interdisciplinary or multidisciplinary foci.

For the ATE program as a whole, more than half (58%) of the grant funds were identified as supporting efforts focused on program development and improvement (18%), materials development (18%), and professional development (22%). Six percent of grant funds was devoted to targeted research, 6 percent to evaluation, and 3 percent to advisory committees (Figure 3). All of these percentages are within 1 percent of the amounts reported on last year's survey.[3]

## Figure 3. Grantee Reported Budget Allocations for Specific Activities/Costs (N=223)
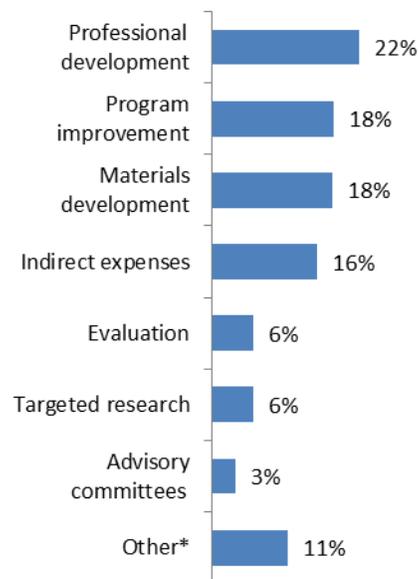
Note: "Other" costs reported by respondents included things like salaries, travel, equipment, outreach, dissemination, marketing, recruitment, administration, and student support. Many of these could/should have been included under the larger categories listed on the survey form.

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[3] See the 2011 ATE Survey Fact Sheet at evalu-ate.org/annual_survey/reports.

One-third of respondents reported spending grant funds on **targeted research.** Among those who spent money on research, the average was 12 percent of the grant budget.[4]

Almost all of respondents (90%) reported some expenditure on evaluation in 2011.[5] Among those that spent money on evaluation, the average allocation was 8 percent. Most projects and centers reported having an evaluator (97%). Figure 4 shows that most respondents reported using evaluators that were external to both the grant and the institution (86%); 11 percent of respondents indicated they had an internal evaluator (4 percent indicated an internal evaluator as their only evaluator). Some projects engaged more than one type of evaluator. This year's findings regarding types of evaluators used and evaluation expenditures are very similar to last year's.[6]

Figure 4. 2011 ATE Grantees' Use of Evaluators (N=223)
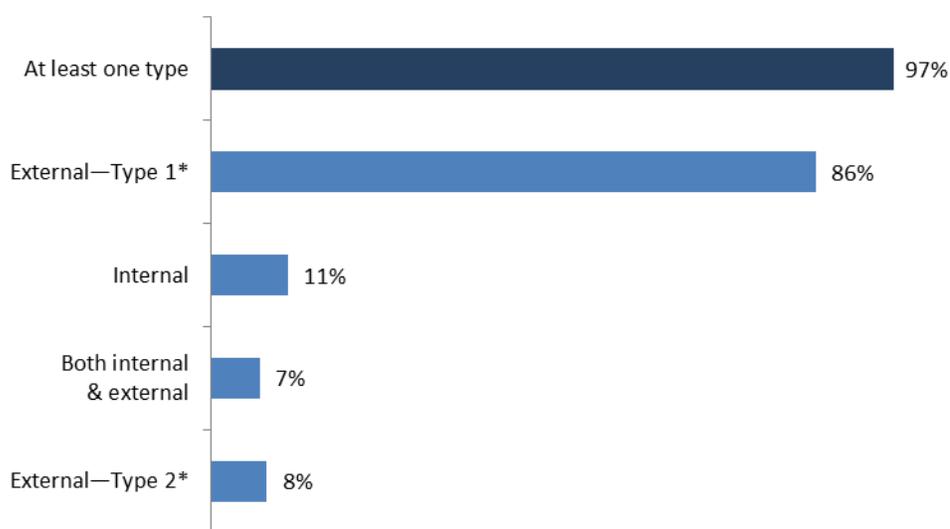
Note: Type 1 external evaluator = external to both institution and grant; Type 2 external evaluator = external to grant, but internal to institution.

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 and most often are permanent. Forty-one percent of respondents indicated that developing articulation agreements was part of their project/center activities; 36 percent provided additional information on these

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[4] 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.

[5] Not all grantees that reported having an evaluator also reported expenditure on evaluation in 2011. Aside from missing data, the 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.

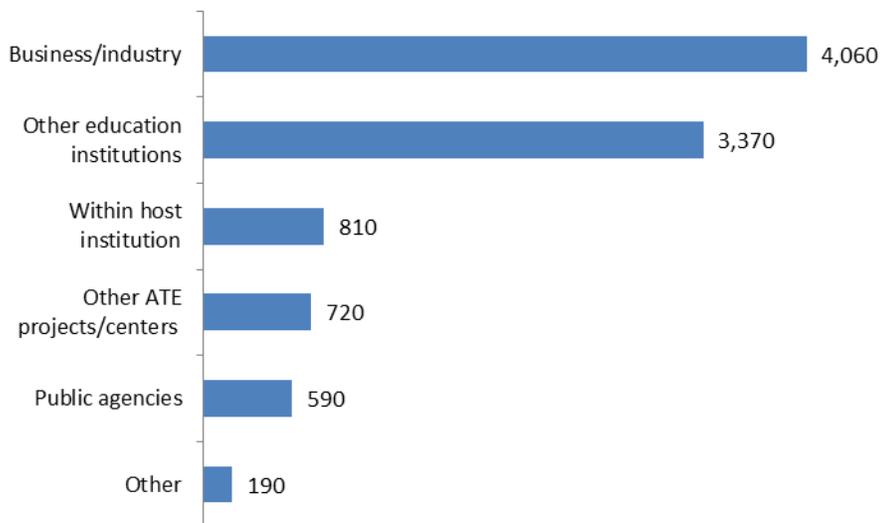[6] See the 2011 ATE Survey Fact Sheet at evalu-ate.org/annual_survey/reports.

agreements. The program totals for 2011 are shown in Table 1. The average grantee engaged in articulation developed approximately two new agreements in 2011, had articulation relationships with more than 10 institutions, and supported the matriculation of approximately 3 students in 2011. Two-thirds of these agreements were between high schools and two-year colleges.

Table 1. Articulation Agreements in 2011 (N=83)

	Between high schools and 2-year colleges	Between 2-year and 4-year colleges	Total
Agreements developed	50	110	160
Agreements in place	590	400	980
Institutions involved	480	440	920
Students that matriculated	700	2,240	2,930

The survey's questions about **collaboration** were accompanied by a definition of this term as "a project/center 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 9,730 collaborating organizations, which collectively added $20 million to the ATE program—$8 million in monetary support and $12 million in-kind. However, just four grants accounted for more than 25 percent of the total number of reported collaborations. The median number of collaborations reported was 19. 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=208)

Business/industry	4,060
Other education institutions	3,370
Within host institution	810
Other ATE projects/centers	720
Public agencies	590
Other	190

Materials Development

By completing this section of the survey, 98 PIs (39% of all survey recipients) indicated that they were significantly involved in developing curriculum and educational materials for national dissemination. Of this group, half reported that they allocated at least 30 percent of their direct costs or $100,000 to materials development in 2011; the remainder indicated that they did not meet this threshold but wanted to report on their work in this area anyway.

Materials addressed here are 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.

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

In total, 2,420 materials were reported, of which 1,330 were drafted and/or field tested in 2011 and 1,090 completed. Of the materials completed, 22 percent were reported to be in use outside of the home and partner institutions (down from 31 percent in 2010). Ten percent were published commercially in 2011, a drop from nearly 25 percent in 2010.[7]

Figure 6—which indicates the number of developed courses, modules, and activities for different education levels—reflects a strong focus on the two-year college level. In addition to the materials included in Figure 6, 54 materials were reported for the "other" education level category, including 20 courses, 30 modules and 4 activities. The sum of the materials reported by education level exceeds the total number of materials developed in 2011, suggesting that a large proportion of materials were intended to serve multiple levels.

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[7] Because the materials reported in this section include those developed or completed in *2011* only, we are not capturing publication of materials developed in prior years.

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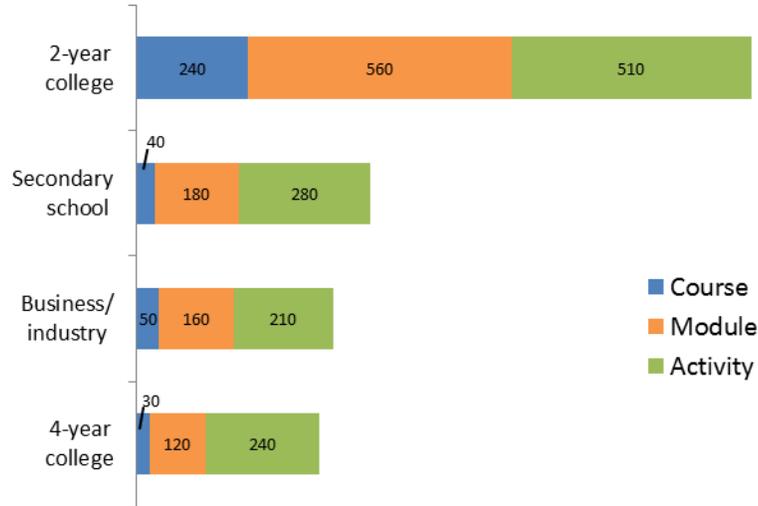
Professional Development

By completing this section of the survey, 114 PIs (46% of survey recipients) indicated that they were significantly involved in providing professional development in 2011. Of this group, 55 reported that they allocated at least 30 percent of their direct costs or at least $100,000 to professional development in 2011; the rest indicated that although they did not meet this threshold, they still wanted to report on their professional development.

These PIs reported providing 2,660 professional development activities in 2011, ranging from short presentations intended primarily to raise awareness to long-term periodic instructional activities (e.g., internships or peer coaching). Almost half of these activities were short presentations. The number of long-term activities reported this year is almost twice as many as last year. Figure 7 shows the number of **activities** of each length that were offered in 2011.[8]

Figure 7. Number of ATE Professional Development Activities by Length (N=107)

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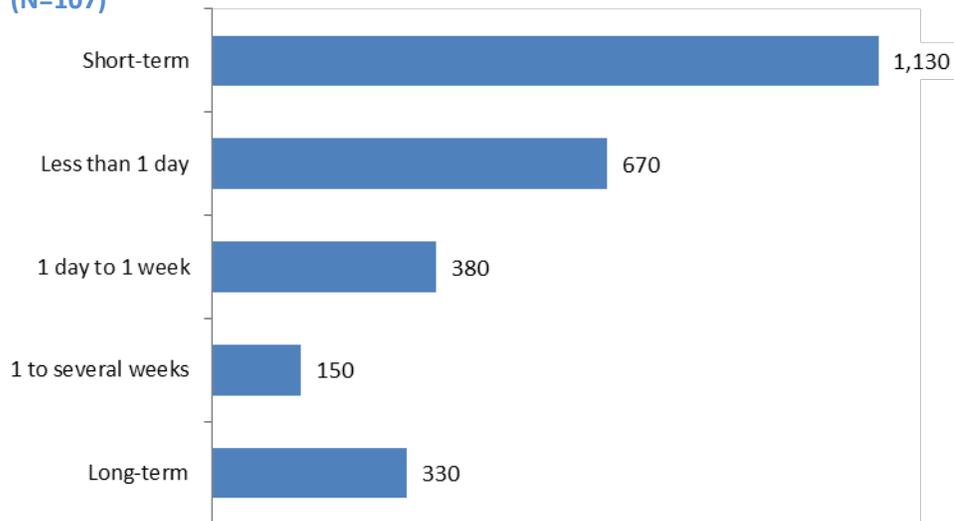
[8] See the 2011 ATE Survey Fact Sheet at evalu-ate.org/annual_survey/reports.

Seventy percent of the 71,810 participants in ATE professional development activities were involved in short presentations to raise awareness. Thirteen percent of all participants were engaged in activities lasting a day or more. Figure 8 shows the number of **participants** in each type of activity in 2011.

Figure 8. Number of ATE Professional Development Participants across Activities of Different Lengths (N=108)
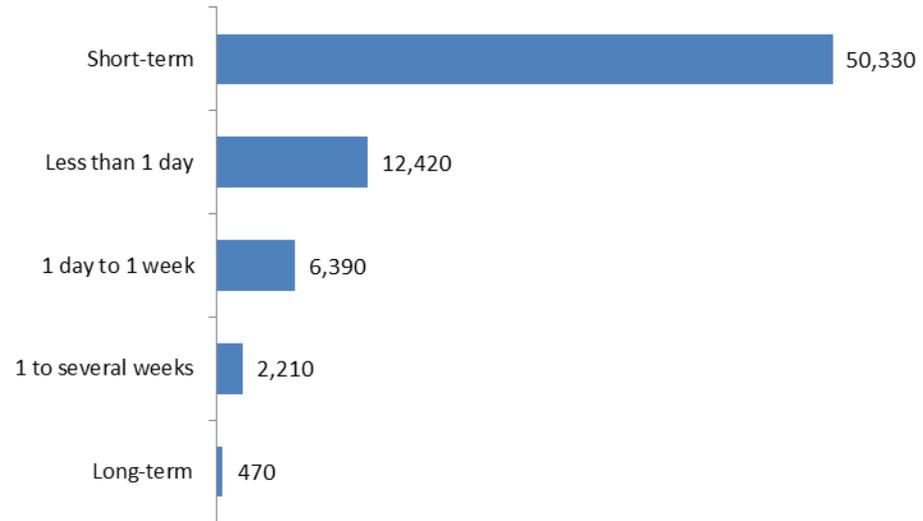
Forty-eight percent of professional development participants were from two-year colleges, and 37 percent were from secondary schools. These results are similar to last year's findings. Figure 9 shows what percentage of the 52,370 participants was reported for each **education level**.[9]

Figure 9. Percentage of ATE Professional Development Participants by Education Level (N=105)

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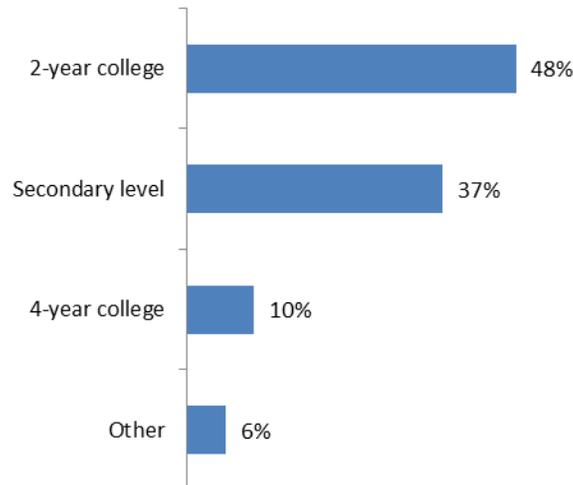
[9] The discrepancy in total participant counts between Figures 8 and 9 is a result of missing data (questions about the total number of participants and the breakdown by education level were asked in separate items on the survey form). Fewer respondents reported participant data by education level than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

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.

Forty-four percent of survey recipients (n=109) completed the Program Improvement section, which includes questions about courses and programs developed or modified with grant funds and at what education levels. Of this group, 64 (59%) reported that they allocated at least 30 percent of their direct costs or at least $100,000 to program improvement in 2011; the remainder indicated that they did not meet this threshold but wanted to report on their work in this area anyway.

Collectively, the respondents in this section reported that they offered 769 programs and 926 courses with ATE support in 2011. A majority of the programs (74%) and courses (80%) were developed for the two-year college level (Figure 10). Because 120 grantees indicated in Section 1 that they provided ATE-supported instruction, but only 109 respondents reported data on programs and courses, these numbers are likely an underestimate of the total number of programs and courses supported by ATE.

Figure 10. Number of ATE-Supported Programs and Courses by Education Level (N=109)
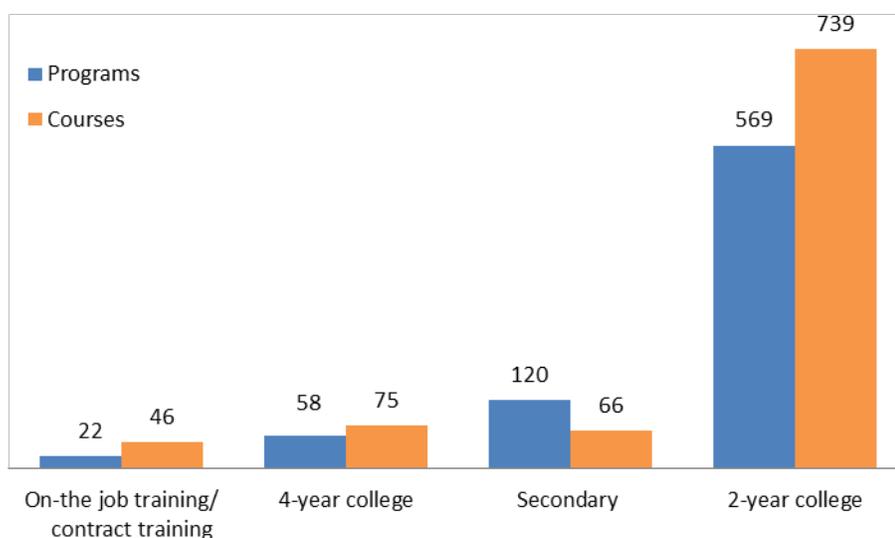
Respondents were asked to report the number of **locations** by education level where ATE-supported programs were offered. The number of reported locations increased from 1,250 in 2011 to 1,720 in 2012. Of these 1,720 locations, most were at secondary schools (64%) and two-year colleges (29%). In 2011, 40 percent of locations were at secondary sites and 50 percent at two-year colleges. These results indicate an increase in programming offered at secondary sites, although just three grants account for 80 percent of the secondary program sites. Thirty-nine respondents reported providing programs

at secondary schools compared with 116 respondents who reported programs at two-year colleges.

Table 2 presents PIs' reports of their **student demographics**. Almost half of the students (42%) were from racial/ethnic minorities, and a little less than one-fourth (22%) were female. These numbers are nearly identical to the demographics reported in last year's survey. Inconsistency between the total number of students reported (in Figure 11 and related discussion) and the sums of subgroups (Table 2) can be attributed to some PIs not reporting demographic data (student demographics data were gathered via a separate question from total enrollments).
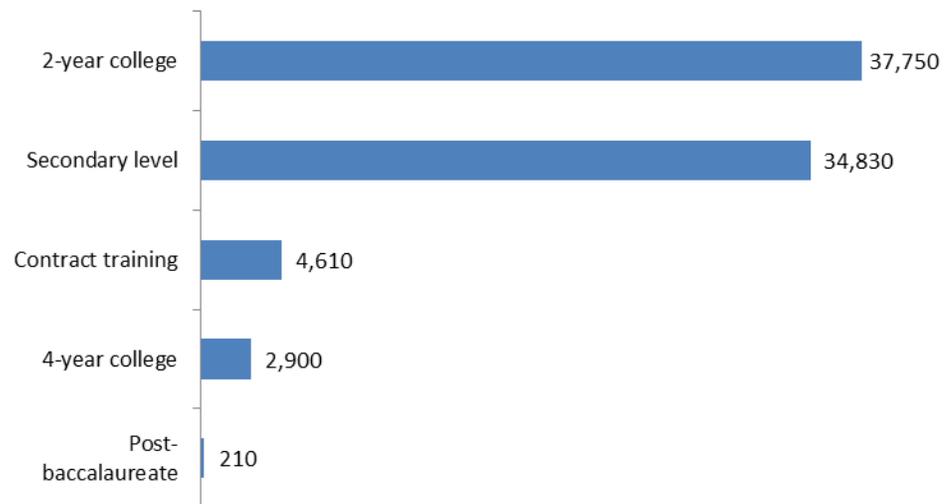
Table 2. Demographic Characteristics of ATE Students

Demographic Characteristic	Number	Percentage of category
Gender (N=109)		
Male	53,110	78%
Female	14,840	22%
Race/ethnicity (N=106)		
Hispanic/Latino	10,630	16%
American Indian/Alaska Native	450	1%
Asian	3,360	5%
Black/African American	10,360	16%
Native Hawaiian/Pacific Islander	600	1%
Multiracial	1,890	3%
White	37,610	58%
Students requesting accommodation under the Americans with Disabilities Act (N=29)	690	-

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 2011. Slightly more than half (52%) of all ATE respondents (N=120) completed these questions on student enrollments. Given that 159 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 80,300 students, with 47 percent enrolled at two-year colleges and 43 percent at secondary schools (Figure 11). This represents a shift in the makeup of students taking ATE-supported courses—in 2011, 60 percent of reported students were enrolled in two-year colleges and 33 percent at secondary schools.

Figure 11. Number of Students in ATE-Supported Courses by Education Level (N=120)

Education Level	Number of Students
2-year college	37,750
Secondary level	34,830
Contract training	4,610
4-year college	2,900
Post-baccalaureate	210

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.

Custom reports may be developed upon request. For more information, contact lori.wingate@wmich.edu.