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This fact sheet summarizes data gathered in the 2009 survey of National Science Foundation (NSF) Advanced Technological Education (ATE) grant recipients. Conducted by The Evaluation Center at Western Michigan University, this was the tenth annual survey of ATE projects and centers. Included here are statistics about the program’s grantees and their activities, accomplishments, and impacts during the 2008 calendar year. Following the report on 2009 survey results, trends over three years are analyzed for selected indicators.

All respondents were asked to complete the first three sections—Grantee Characteristics, Organizational Practices, and Collaboration. They were asked to complete one or more of the remaining three sections—Materials Development, Professional Development, Program Improvement—if they allocated at least \$100,000 or 30 percent of their budgets in 2008 to the activity in question. *Because grantees who did not meet these criteria did not report their activities related to materials development, professional development, and program improvement, results concerning these topics should be regarded as underestimates of the impacts of the overall ATE program.*

The survey population included principal investigators (PIs) for all ATE projects and centers that had been active for at least one year as of January 1, 2009 (N=154). Nearly all of the PIs completed the sections on grantee characteristics (97%), organizational practices (97%), and collaboration (92%). Table 1 provides a comparison of the survey population sizes and response rates since 2007.

Table 1. Population Size and Survey Response Rates 2007-09

	2007	2008	2009
Population	171	164	154
Respondents			
Centers	32	32	31
Projects	130	130	119
Total	162 (95%)	162 (99%)	150 (97%)

At least 30 percent of the PIs who received the survey this year completed the sections on Materials Development (42%), Professional Development (44%), and Program Improvement (30%).

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 2-year associate-degree-granting colleges.”¹ Given the Congressional mandate to engage 2-year colleges, one would expect them to figure prominently as both grantees and beneficiaries of ATE project and center activities. The survey findings regarding grantees, budgets, and participation indicators show this to be the case.

Sixty-nine percent of ATE grants were awarded to 2-year colleges or 2-year college systems, 19 percent were awarded to 4-year colleges/universities, and 5 percent were awarded to nonprofit organizations.²

Respondents also reported that the largest proportions of their budgets were targeted to serve 2-year college audiences. Table 2 indicates (i) the number of respondents who reported allocating *some*

¹ Public Law 102-476.

² The remaining 7 percent included association/societies (3%), K-12 school districts (1%), and other entities (3%).

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portion of their budgets to serve the listed audience type and (ii) the *average percentage* of budgets devoted to these groups.

Table 2. Respondents' Estimates of Allocations of Funds for Audience Types (N=150)

Audience type	Respondents reporting any expenditure on audience type		Percentage of total funds spent on audience (n=150)
	n	%	
2-year college	142	95%	65%
Secondary school	96	64%	20%
4-year college/university	68	45%	9%
Business/industry	48	32%	4%
Association/professional society	10	7%	<1%
Other	14	9%	2%

As shown in Table 2, nearly all projects and centers (95%) reported allocating at least some portion of their budgets to 2-year college audiences. Almost two-thirds of respondents (64%) spent at least some of their budgets on secondary school audiences. In terms of total expenditures across grantees, 65 percent of grant funds was spent on 2-year college audiences and 20 percent was spent on secondary school audiences.

Professional development, materials development, and program improvement are major tracks within the ATE program. Table 3 provides respondents' estimates of how they allocate ATE funding across these and other activities/cost categories. These estimates provide a rough indicator of the relative emphases placed on these areas by ATE grantees. Seventy percent or more of respondents reported allocating some of their budgets to materials development, professional development, or program improvement—and these activities also command the largest proportion of budgets (averaging 23% to 28% each per grant).

Table 3 also provides a first glimpse of the extent to which projects and centers sought evaluative and advisory input. Most PIs (90%) reported expenditures on evaluation. Fewer (51%) reported expenditures on advisory committees. In terms of total expenditures across grantees, 59 percent of grant funds went toward program improvement (20%), professional development (21%), and materials development (18%)

efforts. Seven percent of grant funds was devoted to evaluation, 4 percent to targeted research, and 2 percent to advisory committees. It is probable that expenditure on advisory committees is not a good indicator of grantees' use of advisory committees, since 83 percent of respondents said they had advisory committees (see Table 5). In many cases, participation on advisory committees may be an in-kind contribution to ATE projects and centers.

Table 3. PIs' Estimates of Allocations of Funds for Specific Activities (N=150)

Activity	Respondents reporting any expenditure on activity		Percentage of total funds spent on activity (n=150)
	n	%	
Program improvement	107	71%	20%
Professional development	134	89%	21%
Materials development	105	70%	18%
Institutional indirect costs	128	85%	15%
Evaluation	135	90%	7%
Targeted research	42	28%	4%
Advisory committees	77	51%	2%
Other ^a	61	41%	13%

^a Respondents identified "other" expenses for dissemination, equipment, general operations, marketing, personnel, student support, travel, and Web site support—although these were intended to be counted under the general program categories they served.

Forty-nine percent of the respondents indicated that developing articulation agreements is part of their project/center activities. These 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. On average, (a) there is slightly more than one agreement per institution, and (b) five students are engaged per agreement.

Almost twice as many articulation agreements were formed between high schools and 2-year colleges than between 2- and 4-year colleges (920 vs. 564). Correspondingly, more institutions and students also are engaged in the articulation agreements between high school and 2-year colleges (see Table 4). More than two-thirds (70%) of the students who articulated

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were associated with one ATE grant that involves a statewide technical and community college system that includes 12 colleges.

Table 4. Articulation Agreement Facts

	<i>Between high schools and 2-year colleges</i>	<i>Between 2-year and 4-year colleges</i>	<i>Total</i>
Number of agreements	920	564	1,484
Number of institutions involved	823	397	1,220
Number of students that articulated in '08	20,800 ^a	2,200	23,000
Number of agreements with concurrent matriculation	500	100	600

^a 16,300 of these 20,800 students were reported by one project that involves a statewide consortium of community and technical colleges.

Forty-percent of these agreements provide opportunities for concurrent matriculation (i.e., courses count for credit in both institutions). As Table 4 also shows, opportunities for concurrent matriculation are much more likely to occur as a result of agreements between high schools and 2-year colleges than between 2- and 4-year colleges.

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.

As shown in Table 5, in 2008 more than 80 percent of projects and centers (a) supported professional development for their staff (83%), (b) engaged an advisory committee (83%), and (c) used an evaluator (97%). Almost half (47%) conducted a workforce needs assessment in 2008.

Table 5. Organizational Practices (N=150)

<i>Type of organizational practice in which the center/project engages</i>	<i>n</i>	<i>%</i>
Staff development		
ATE grant funds provided support for project/center personnel professional development	124	83%
Advisory committees		
National advisory committee	58	39%
Regional advisory committee	44	29%
Local advisory committee	78	52%
At least one type of advisory committee	125	83%
Evaluation		
External evaluator only (external to the project/center and institution)	108	72%
External evaluator only (external to project/center but internal to institution)	3	3%
Internal evaluator only (a project/center staff member)	7	5%
Both internal and external evaluators	25	17%
At least one type of evaluator	145	97%
Workforce needs assessment		
Workforce needs assessment data gathered in 2008	70	47%

COLLABORATION

The survey defines 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. Table 6 shows that of the almost 5,000 reported collaborator groups, most were from business/industry (42%) or other education institutions (33%). In 2008, these collaborations added about \$27 million to the ATE program—\$20 million in monetary support and \$7 million in in-kind support.

Table 6. Number of Groups and Organizations Collaborating with Projects and Centers (N=142)

<i>Type of collaborator</i>	<i>Number of collaborators</i>	<i>Percentage of total number of collaborators</i>
Business/industry	2,071	42%
Within host institution	484	10%
Education institutions	1,644	33%
Public agencies	335	7%
Other ATE awards	272	6%
Other types)	113	2%
Total	4,919	100%

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MATERIALS DEVELOPMENT

This section of the survey focused on materials developed for *national dissemination* to serve instructional purposes. 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.

By completing this section of the survey, 64 PIs (42% of the survey population) indicated that they were significantly involved in materials development. As Table 7 shows, about 2,500 materials were at various stages of completion in 2008.

Table 7. Number of Materials under Development or Completed (N=64)

	<i>Number of materials</i>	<i>Percentage of all materials developed</i>
Draft stage	754	30%
Field-tested	838	33%
Complete	921	37%
Total	2,513	100%

As shown in Table 8, materials developed for 2-year college audiences account for almost half (48%) of all the materials developed in 2008.

Table 8. Materials Developed for Specified Target Audiences

<i>Target audience</i>	<i>Type of Material</i>			<i>Total</i>	<i>%</i>
	<i>Course</i>	<i>Module</i>	<i>Activity</i>		
Secondary	30	166	137	333	16%
2-year college	157	410	431	998	48%
4-year college	38	186	286	510	25%
Business/industry	42	118	62	222	11%
Other	1	4	1	6	<1%
Total	268	884	917	2,069 ^a	100%

^a The total number of materials in this table does not match the total in Table 7 because of missing data.

Of the completed materials (n=921), two-thirds (66%) were reported to be in use at other institutions; 59 percent were reported to be in use locally; and 7 percent were published. Moreover, PIs collectively reported that more than 750 institutions were using one or more of the materials developed with ATE funds.

PROFESSIONAL DEVELOPMENT

The 67 PIs (44% of survey recipients) who completed this section of the survey reported that they provided about 4,300 professional development activities in 2008. As Table 9 indicates, the majority of professional development participants came from 2-year colleges (42%) and secondary schools (29%).

Table 9. Professional Development Participation by Primary Target Audience

<i>Primary target audience</i>	<i>Number of participants^a</i>	<i>Percentage of all participants</i>
2-year college	19,400	42%
Secondary	13,100	29%
Business/industry	8,800 ^b	19%
4-year college	4,400	10%
Total	45,700	100%

^a Figures are rounded to the nearest hundred.

^b This number does not include the more than 100,000 participants in short presentations that were reported by a single respondent. The figure was not included because it is such an extreme outlier—the next highest reported number was 1,500; last year, the total number of professional development participants was 49,000.

Table 10 shows the number of participants in professional development activities hosted by projects and centers, broken out by length of activity. About three-fourths of all participants engaged in brief

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programs lasting less than a day. Fewer than 5 percent engaged in activities that lasted more than a week.

Table 10. Professional Development Participation by Length of Activity

<i>Length of activity</i>	<i>Number of participants^a</i>	<i>Percentage of all participants</i>
Short/awareness	27,700 ^b	61%
Less than 1 day	10,600	23%
1 day to 1 week	5,900	13%
1 to several weeks	1,200	3%
Long-term/ periodic	300	<1%
Total	45,700	100

^a Figures are rounded to the nearest hundred.

^b See note b in Table 9.

PROGRAM IMPROVEMENT

Thirty percent (n=46) of survey respondents completed the program improvement section of the survey, indicating that they were significantly engaged in improving their education programs. The survey defines a program as a sequence of courses, laboratories, and/or work-based experiences that lead students to a degree, certification, or occupational competency point.

Tables 11 and 12 present respondents' estimates regarding the number of (a) programs and (b) courses improved with ATE support, (c) locations where these programs and courses were offered, and (d) enrolled students. Table 11 presents these numbers in terms of the overall ATE program, and Table 12 provides per-grant averages. Both tables break out the numbers by education level (2-year college, 4-year college, secondary school, and on-the-job). As is typical of data presented in most other tables, productivity is highest at the 2-year college level.

Table 11. Program Improvement Characteristics: Numbers of Programs, Locations, Courses, and Students Involved

	<i>Programs</i>	<i>Locations</i>	<i>Courses</i>	<i>Students^a</i>
Secondary	56	284	59	8,400
2-year college	333	290	811	48,600
4-year college	23	38	54	2,000
On-the-job	26	31	64	900
Total	438	643	988	59,900

^a Figures are rounded to the nearest hundred.

Table 12 shows that projects and centers involved in 2-year college program improvement, on average, offered 10 programs, including 23 courses, at 9 locations and served 1,430 students per grant.

Table 12. Program Improvement Characteristics: Per-Grant Average Numbers of Programs, Program Locations, Courses, and Students Involved

	<i>Programs</i>	<i>Locations</i>	<i>Courses</i>	<i>Students^a</i>
Secondary	4	22	4	470
2-year college	10	9	23	1,430
4-year college	3	4	7	180
On-the-job	3	5	11	150

^a Figures are rounded to the nearest ten.

Table 13 presents PIs' estimates of the demographic makeup of their student participants—persons who had taken at least one ATE course in 2008. According to the numbers reported, almost two-thirds are nonwhite (63%); more than three-quarters are male.

Table 13. Demographic Characteristics of ATE Students

<i>Demographic Characteristic</i>	<i>Number^a</i>	<i>Percentage of category</i>
Gender		
Male	42,900 ^b	77%
Female	12,800	23%
Race/ethnicity		
Hispanic/Latino	11,600 ^b	30%
American Indian/Alaska Native	600	2%
Asian	3,200	8%
Black/African American	6,100	16%
Native Hawaiian/Pacific Islander	600	2%
Multiracial	2,000	5%
White	14,400	37%
Students requesting accommodation under the Americans with Disabilities Act	200	-
Incumbent workers (i.e., students who are employed as technicians while enrolled)	11,600	-

^a Figures are rounded to the nearest hundred.

^b About 22,600 of the 42,900 male students and 7,000 of 11,600 Hispanic/Latino students were reported by one grant that involves seven community colleges. These figures are consistent with those reported on the grantee's Web site.

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TRENDS: 2006-09

In this final section, we consider trends in the data since 2006 (the survey form has not changed since that year). In interpreting trends in aggregate numbers (as opposed to averages), one must keep in mind that the difference in the numbers of respondents over the years. Table 14 indicates the number of respondents per year and by survey section:

Table 14. Population Size and Survey Response Rates for Survey Years 2007-09

	2007	2008	2009
Population	171	164	154
Respondents by survey section			
1. Grantee Characteristics	162	162	150
2. Organizational Practices	162	160	150
3. Collaboration	155	154	142
4. Materials Development	50	57	54
5. Professional Development	63	68	67
6. Program Improvement	57	53	46

Funding allocations for various audience types changed very little over the past three years, as illustrated in Figure 1. Note that the average percentage of budgets allocated to community colleges is much larger than for all other types, as expected. However, while the average allocation to community colleges has not increased across the three years, the typical allocation to other groups has increased approximately 10 percent.

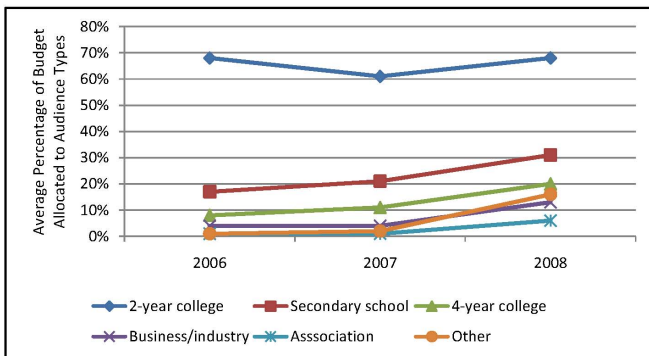


Figure 1. Respondents' Estimates of Allocations of funds for Audience Types: 2006-08

In terms of the percentages of project and center budgets allocated to types of activities, the allocations have been fairly stable over the three-year period.

Allocations to materials development have increased slightly more than other areas, up 7 percent from 2006 to 2008. Increases in other activity areas were less than 5 percent. These trends are depicted in Figure 2.

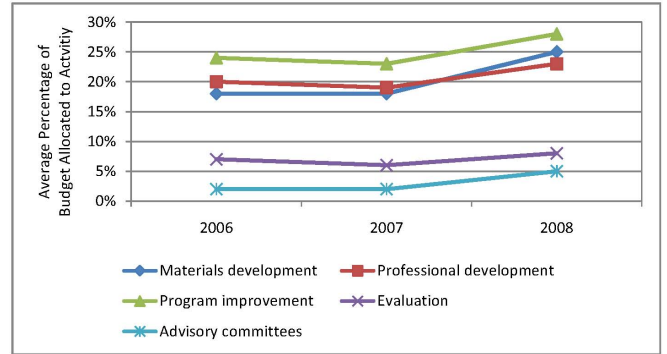


Figure 2. Respondents' Estimates of Allocations of Funds to Activities: 2006-08

The number of articulation agreements in place has been fairly stable since 2006, with about 1,500 agreements reported annually. However, in 2008 there was a dramatic increase in the number of students that articulated. This increase, shown in Figure 3, is due to one grant that involves a statewide consortium of community and technical colleges, which reported more than 16,000 students.

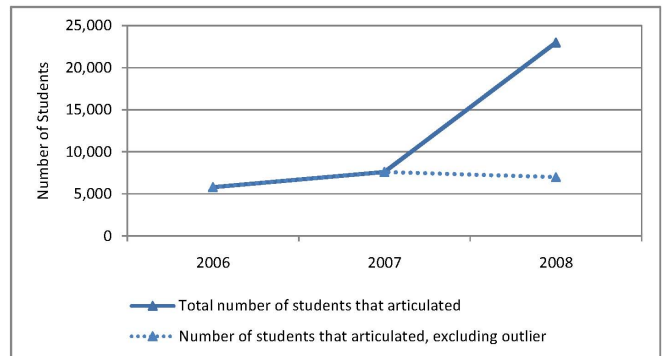


Figure 3. Number of Students that Articulated: 2006-08

Grantees are now in nearly full compliance with stated program evaluation expectations—97 percent reported use of an evaluator (up from 89 percent in 2007 and 86 percent in 2006). Reported use of advisory panels has not changed much, but more than 80 percent have reported using them over the past three years. The percentage of grantees that conducted a workforce needs assessment has hovered between 40 and 50 percent over the past three

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years—and we would not expect grantees to conduct a needs assessment every year. These trends are depicted in Figure 4.

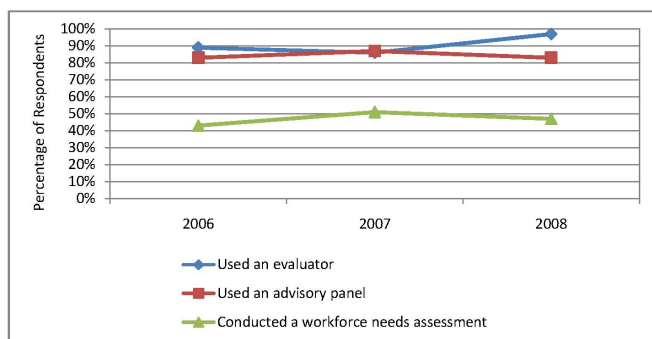


Figure 4. Percentage of Grantees that Used of Evaluators, Advisory Panels, and Workforce Needs Assessments: 2006-08

A substantial increase in the overall value of monetary contributions occurred in 2008, as shown in Figure 5, with collaborators reportedly contributing almost three times as much as they had in 2007. Seventy percent of the 2008 monetary contributions is associated with three grantees, which reported contributions of \$1.2, \$5, and \$7.9 million. The next largest monetary contribution reported was \$809,000. In-kind contributions have seen less fluctuation, ranging between \$7 million and \$9.5 million).

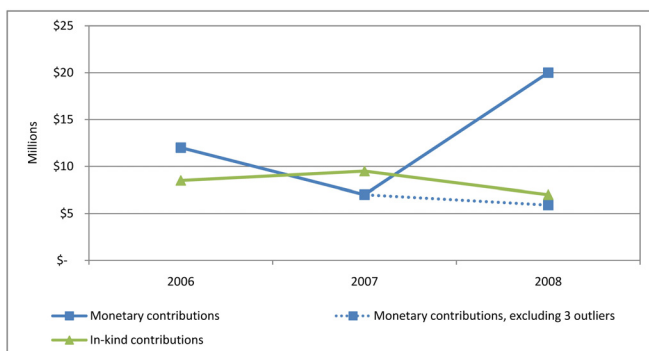


Figure 5. Monetary and In-kind Contributions: 2006-08

The reported number of materials developed last year is close to what was reported for 2006. Overall, about 2,500 materials were reported for last year, which is more than two-and-a-half times what was reported for 2006. There has been a steady increase in number of courses and modules developed, while there was a spike in 2007 in terms of the number of activities produced (one grantee was responsible for 20 percent

of all activities developed that year). These trends are depicted in Figure 6.

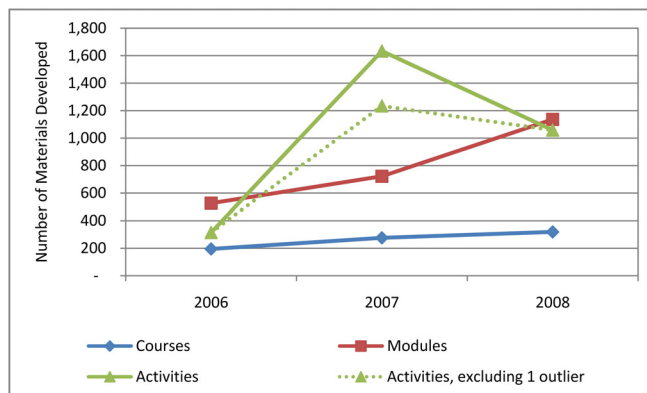


Figure 6. Number of Courses, Modules, and Activities Developed: 2006-08

The audiences targeted for the developed courses, modules, and activities tend to shift from year to year; except for a drop in the number of materials developed for business and industry audiences after 2006, there is no clear trend in terms of increasing or decreasing emphasis on a particular audience—see Figure 7. Two-year college audiences continue to command the most attention.

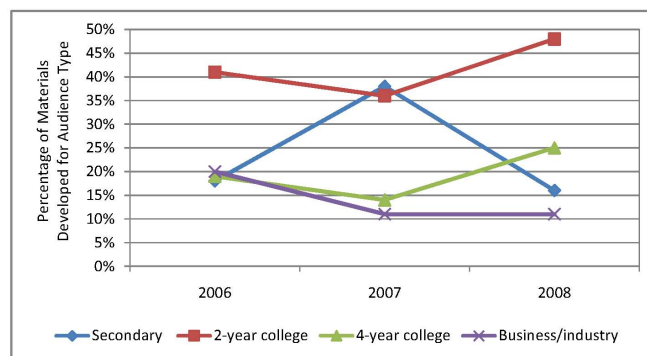


Figure 7. Percentage of Materials Developed for Audience Types: 2006-08

The number of professional development activities has increased steadily, with more than twice as many activities reported for 2008 than for 2006 (4,300 v. 1,400). Although there were somewhat fewer professional development participants in 2008 compared with 2007, more than one-and-a-half times as many people participated in ATE-supported professional development in 2008 than in 2006. A little more than half of the participants (58%) in 2008 were involved in short activities to raise awareness. Figure 8, which depicts the number of professional

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development participants by length of activity, shows that the number of participants in activities lasting a day or less has increased while the data for 2006 and 2008 show similar numbers involved in activities lasting one day or more.

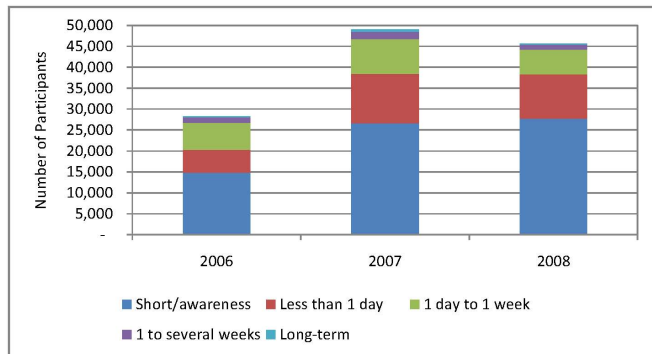


Figure 8. Number of Professional Development Participants by Length of Activity: 2006-08

NOTE: Significantly fewer grantees completed the program improvement section of the survey—46 this year, compared with 53 and 57 in the preceding years. This should be kept in mind when interpreting the changes in aggregate numbers over the past three years. In the Grantee Characteristics section, a smaller proportion of respondents indicated expenditures of 30 percent or more on program improvement in 2008, in comparison with the previous year (29% v. 37%), suggesting a shift in the program’s grant characteristics, rather than a failure to complete the survey section.

There has been a steady increase in the number of programs offered, with 380 reported for 2006 and 438 reported for 2008 (a 15 percent increase over three years). Likewise, the number of locations where ATE courses are offered has more than doubled since 2006. Given that fewer respondents completed this section of the survey, this increase suggests that individual projects and centers are extending their reach in terms of where they are offering courses. For example, the average number of locations where ATE-supported secondary-level courses were offered in 2006 was 5; in 2008, the per-grant average was 22. Counter to this growth is a decline in the number of courses reported over the past three years. These trends are depicted in Figure 9. Per-grant averages with regard to the number of courses offered in 2008 are similar to the averages for 2006, except with regard to secondary-level courses. The average

number of secondary-level courses was four times greater in 2008 compared with 2006 (16 v. 4). Overall, the decline in the number of courses offered appears to be due to fewer grantees significantly engaged in this area, since individual grant productivity generally has not changed significantly or has increased.

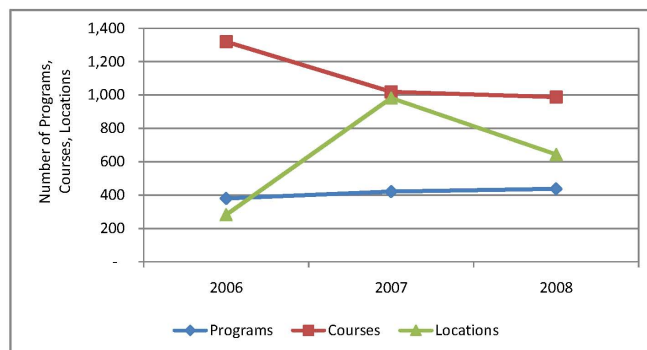


Figure 9. Number of Programs, Courses, and Locations: 2006-08

From 2006 to 2007, the reported number of students enrolled in ATE courses almost doubled, from 43,000 to 83,400. However, almost 50 percent (40,000) of the students reported in 2007 were associated with a single grant. This project did not meet the criteria for completing the Program Improvement section of the survey this year (this respondent indicated that 20 percent—less than \$80,000 of the grant—went to program improvement. Accordingly, the 2008 numbers show a leveling off, with 59,900 students reported, as shown in Figure 10.

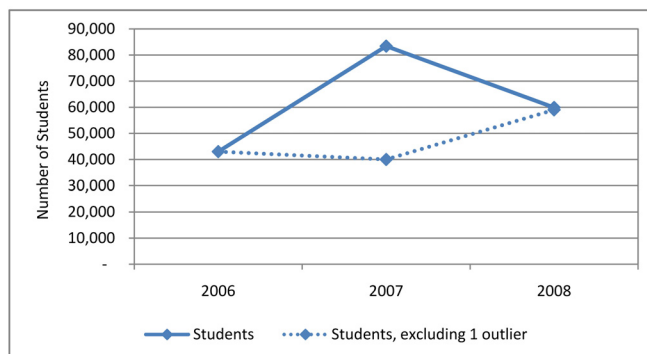


Figure 10. Number of Students: 2006-08

Student demographic data reported by respondents indicate increases in the proportion of minority students. In 2008, nonwhite students represented two-thirds of all ATE students, up from just one-third in 2006. Significant growth was seen in the proportion

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of Hispanic/Latino students, who now reportedly account for 30 percent of all ATE students. These trends are consistent with NSF's interest in "broadening opportunities and enabling the participation of all citizens."³ Figure 11 illustrates how the racial/ethnic make-up of ATE students has changed over time.

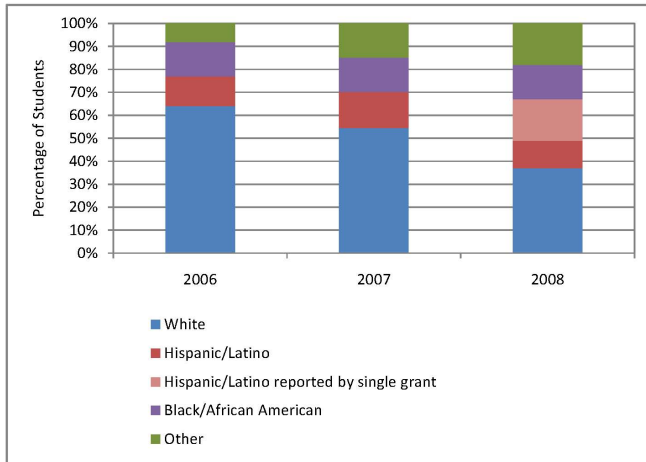


Figure 11. Student Race/Ethnicity: 2006-08

With regard to gender, following an increase in the number of female students last year, proportions shifted again so that men account for three-fourths of ATE students. Figure 12 shows how the male-female balance has shifted slightly over time.



Figure 12. Student Gender: 2006-08

As indicated by Figures 11 and 12, the increases in proportions of Hispanic and male students is attributed to a single grant that serves seven community colleges (the survey data were corroborated by a report on the grantee's Web site).

SUMMARY

Findings from the 2009 survey show that the ATE program continues to perform well within the mandates for its operation. Numbers reported for 2008 indicated that ATE projects and centers

- enabled the articulation of more than 23,000 students, mostly from high schools to 2-year colleges
- developed more than 2,500 curriculum materials, nearly half of which were targeted to two-year college audiences
- delivered more than 4,300 professional development activities to more than 45,700 individuals, mostly secondary school and 2-year college faculty
- served at least 60,000 students, mostly at 2-year institutions
- received more than \$27 million in monetary and in-kind support from collaborators, more than 40 percent of which were business and industry groups

Trend data generally show growth over the past three years. Grantees reported receiving almost three times as much in monetary contributions from collaborators in 2008 compared with 2007. There has been steady growth in the numbers of articulating students, curricula in the form of courses and modules, professional development activities, and programs. Although women are not as well represented among ATE students as they were in 2007, 2008 saw a substantial increase in the proportion of students who are nonwhite. Where data show fluctuations from year to year, it is likely changes in the emphases of particular grants, with some starting and others completing during any given year. As seen with regard to the 2008 findings on articulating students, gender, and ethnicity (see Tables 4 and 13 and Figures 3, 10, 11, and 12), a single project or center can make a substantial impact on individual indicator values. Additional research is needed to understand the causes behind significant changes from one year to the next.

³ National Science Foundation. (2005). *ATE program solicitation* (NSF 05-530). Washington, DC: Author. (p.15)