The Evaluation Center

ADVANCED TECHNOLOGICAL EDUCATION PROGRAM FACT SHEET

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This fact sheet summarizes data gathered in the 2007 annual survey for the National Science Foundation's (NSF) Advanced Technological Education (ATE) program. This was the eighth annual survey of ATE projects and centers conducted by The Evaluation Center at Western Michigan University. Included here are statistics about the program's grantees and their work activities, accomplishments, and impacts.

The 2007 survey contained 6 sections. Three of these—grantee characteristics, organizational practices, and collaboration—were required for all respondents. Materials development, professional development, and program improvement were required only for those grantees allocating ≥$100,000 or ≥30 percent of their direct costs in the past 12 months to that activity.[1] Information regarding articulation agreements was captured under grantee characteristics, rather than via a separate section as in previous years. New items were added to describe professional development support for project faculty and staff in the required section on organizational practices.

Using the NSF awards database, the survey population was selected in November 2006. The population included all 171 active project and center grants that had been active for at least 1 year at the time of the survey and/or were continuation grants, having received a precursor ATE award. The Web-based survey was administered to principal investigators (PIs) from February 26, 2007, through April 6, 2007. During this time, 162 PIs (95%) completed at least the grantee characteristics and organizational practices sections.[2] Table 1 provides a comparison of the population size and response rates for 2007 and 2006.

Table 1. Population Size and Survey Response Rates for 2006-2007

	2006 N (%)	**2007** N (%)
Population Size	178	171
Respondents		
Centers	35	32
Projects	128	130
Total	163 (92%)	162 (95%)

GRANTEE CHARACTERISTICS

Who received the grant awards? Seventy-three percent of grants were awarded to 2-year colleges or 2-year college systems, 14 percent were awarded to 4-year colleges/universities, and 2 percent were awarded to associations or societies.[3]

What constituent groups were served? Nearly all projects and centers (93%) reported allocating at least 10 percent of their budgets to 2-year colleges. Table 2 supplements that primary piece of information by providing an average percentage of project/center budgets targeted to serve each type of constituent group. It shows that 2-year colleges commanded more than two-thirds of all grant budgets (68%), with secondary schools targeted for the majority of the remaining funds. Together, 4-year colleges and business and industry account for just 12 percent of the targeted funds. This is in keeping with the ATE philosophy, "The ATE program focuses on two-year colleges and expects two-year colleges to have a leadership role in all projects. Effective technological education programs should involve partnerships in which two-year colleges work with four-year colleges and universities, secondary schools, business, industry, and government, and should respond to employers' need for well-prepared technicians with adaptable skills."[4]

[1] These criteria for responding to survey sections are similar to those used in 2006.
[2] As noted in Table 1, the population size (N) is 171 for this survey. However, for the purposes of this report, we treated the 162 responses as the N size of the population to simplify reporting subgroup information.
[3] The remaining 11 percent included "other" (10%) and missing data (1%).
[4] National Science Foundation. (2007). Program solicitation (NSF 07-530). Washington, DC: Author.

Table 2. Project and Center Funding Targeted to Serve Individuals and Groups in the Various Types of Institutions and Organizations (N=162)

Type of Institution or Organization	Project/ Center Respondents (n)	Mean % of Budget
2-Year College	151	68
Secondary School	95	17
4-Year College/University	66	8
Business/Industry	40	4
Association/Society	12	1
Other	12	1

Note. Respondents were asked to specify the percentage of their grant budget targeted to serve individuals or groups at each type of institution or organization. The mean percentage of budget is based on the number of PI responses (non-zero answers only) for each targeted funding type.

Table 3 provides response rates by survey section and PIs' estimates of their allocations of ATE funding. Those response rates reflect the nature of grant activities conducted. Almost all PIs reported their involvement in collaborative efforts, and approximately a third met the criteria for significant engagement in materials development and program improvement; nearly 40 percent were significantly engaged in professional development efforts.

Table 3. Survey Response Rates and PIs' Estimates of Total Award Allocations of Funds (N=162)

	Survey Section Response Rate		Program Funding Allocation for the Past 12 Months	
	n	%	%	$
Grantee Characteristics	162	100%	-	-
Organizational Practices	162	100%	-	-
Collaboration	155	96%	-	-
Materials Development	50	31%	18%	$7,495,500
Professional Development	63	39%	20%	$8,320,400
Program Improvement	57	35%	24%	$10,021,800
Targeted Research	162	100%	4%	$1,612,600
Evaluation	162	100%	7%	$3,101,800
Advisory Committees	162	100%	2%	$1,022,100
Institutional Indirect Costs	162	100%	14%	$6,030,600
Other	162	100%	10%	$4,355,200
Total			100%	$41,960,000

Note. Funding allocations represent the annualized funding (total award divided by length of project in years) multiplied by the percentage allocated for a specific category. The number of respondents in materials development, professional development, and program improvement are lower than the response rate in other categories, reflecting the reporting criteria of projects/centers allocating ≥$100,000 or ≥30 percent of their direct costs in the past 12 months to these activities.

PIs of 66 percent of the projects and 79 percent of the centers completed at least 1 of the 3 activity sections: materials development (37 projects, 3 centers), professional development (41 projects, 22 centers), or program improvement (42 projects, 15 centers). Of the 84 project and 27 center PIs who completed an activity section, 38 percent of project PIs and 59 percent of center PIs reported engaging in more than 1 activity.

Table 3 also provides a first glimpse of the extent to which projects and centers employ evaluative and advisory efforts. PIs reported that 9 percent of funds were allocated to evaluation and soliciting advice on how to conduct grant work. (Table 5 provides additional details on evaluation and advisory matters.)

Forty-three percent of the respondents indicated that developing articulation agreements is part of their project/center activities.[5] 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) approximately four students are engaged per agreement.

Table 4. Articulation Facts (n=69)

	Between High Schools and 2-Year Colleges	Between 2-Year and 4-Year Colleges	Total
Number of Agreements	927	553	1,480
Number of Institutions Involved	838	506	1,344
Number of Students	3,140	2,634	5,774
Number of Agreements Providing for Concurrent Matriculation	268	90	358

Many more articulation agreements exist between high schools and 2-year colleges than between 2- and 4-year colleges—(927 vs. 553). Correspondingly, more institutions and students are also engaged in the high school to 2-year college articulations (see Table 4).

Approximately a quarter (24%) of these agreements provide opportunities for concurrent matriculation (i.e., courses count for credit in both locations). As Table 4 also shows, opportunities for concurrent matriculation are more likely to occur as a result of agreements

[5] 2007 data regarding articulation agreements were obtained in the grantee characteristics section of the survey, which all respondents were required to complete. In previous years, the survey contained a separate section for articulation agreements and completion was limited to those projects and centers that received funding specifically to develop such agreements. Consequently, this figure is much higher than for 2006.

between high school and 2-year colleges than between 2- and 4-year colleges (29% versus 16%).

ORGANIZATIONAL PRACTICES

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

Table 5. Indicators of Organizational Practices (N=162)

Indicator	%	Total
Professional Development Opportunities for Project/-Center Staff/Faculty		
ATE grant funds provided support for professional development by project/center staff/faculty in the past 12 months	80%	
No ATE grant funds were used to provide support for professional development by project/center staff/faculty in the past 12 months	18%	100%
Missing data (did not report)	2%	
Advisory Committees		
National advisory committee	38%	Multiple Response Item
Regional advisory committee	28%	
Local advisory committee	55%	
At least one type of advisory committee	83%	
Evaluation		
No evaluator	10%	
External evaluator only (external to the project/center and institution)	72%	
External evaluator only (external to the project/center but internal to the institution)	4%	102%*
Internal evaluator only (a project/center staff member)	4%	
Both internal and external evaluators	11%	
Missing data (did not report)	1%	
Workforce Needs Assessment		
In the past 12 months	43%	100%
Did not do in past 12 months	53%	
Missing data (did not report)	4%	

**Note*. Percentages do not total 100 due to rounding.

At least 80 percent of projects and centers (a) supported professional development for their staff, (b) engaged at least one advisory committee, and (c) employed an evaluator. A much smaller proportion (43%) conducted a workforce needs assessment in the past year.

COLLABORATION

Collaboration was defined for this survey as a project/center relationship with another institution, business, or group that included the collaborator's contribution of money and/or in-kind support to grantees.[6] Table 6 shows that of more than 5,000 reported collaborators, approximately three-quarters (78%) of these collaborative relationships involve business, industry, or other education institutions.

In the past 12 months, these collaborations increased the program's total resources from approximately $42 million to $62.5 million. Of the $20.5 million contributed by collaborators, $12 million was monetary and $8.5 million was in-kind support.

Table 6. Number of Groups and Organizations Collaborating with Projects and Centers (N=155)

Type of Collaborator	N	% of Total
Business/Industry	2,267	42%
Within host institution	469	9%
Other education institutions	1,981	36%
Public agencies	348	6%
Other ATE awards	279	5%
Other types	90	2%
Total	5,434	100%

MATERIALS DEVELOPMENT

This section of the survey focused strictly on materials developed for national dissemination to serve instructional purposes (e.g., it did not include project/center promotional materials). Materials addressed here were 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.[7]

Fifty PIs (31%) reported that they were significantly engaged in materials development during the past 12 months. As Table 7 shows, three-fourths (76%) of the

[6] Collaborators are *not* funded by the ATE grant.
[7] This was a new category for the 2007 survey.

materials they reported developing were either completed or being field-tested.

Table 7. Number of Materials Under Development or Completed

	n	%
Number in draft stage	254	25%
Number being field-tested	382	37%
Number that are complete	399	39%
Total	1,035	100%

These PIs reported further that *2-year colleges* were the primary target audience for all types of materials (Table 8). The emphasis on 2-year colleges is most notable in course development where the number of courses developed for 2-year colleges is more than 5 times the number being developed for any other education level. Almost equal numbers of materials were under development or completed for the target audiences of secondary schools, 4-year colleges, and business/-industry. The largest numbers of materials were consistently in the *module* category—more than two-thirds of all materials.

Table 8. Number and Types of Materials Under Development or Completed for Specified Targeted Audiences

	Type of Material				
Target Audience	**Course**	**Module**	**Activity**	**Total**	**%**
Secondary	19	162	96	277	18%
2-year college	99	365	158	622	41%
4-year college	11	272	12	295	19%
Business/Industry	17	258	25	300	20%
Other	2	8	18	28	2%
Total	148	1,065	309	1,522	100%

Of the completed materials, the majority are in use beyond the bounds of the local institution (57%) or published (3%). Moreover, PIs indicated that more than 500 institutions were using at least 1 material developed with support from their ATE grants.

PROFESSIONAL DEVELOPMENT

Thirty-nine percent of all project and center PIs completed this section and reported providing more than 1,400 professional development activities in the past year. As Table 9 shows, the large majority of professional development participants were two-year college faculty and secondary school faculty. These two groups were approximately equal in size. Additionally, a sizeable fraction of professional development serves workers already employed in business or industry.

Table 9. Professional Development Participation by Primary Target Audience

Primary Target Audience	**n**	**%**
Secondary	9,961	35%
Associate	10,419	37%
Baccalaureate	1,752	6%
Business/Industry	6,264	22%
Total	28,396	100%

Table 10 shows the numbers and types of professional development provided. It shows that approximately half of all professional development participants engage in short awareness activities and 72 percent are engaged for less than one day. Six percent of participants are involved in activities lasting more than a week. Long-term periodic activities (e.g., internships) account for a very small proportion of total participation, much smaller than any of the other types of activities. Generally, centers engage greater numbers of persons in professional development activities than do projects. The difference is most notable in short/awareness types of activities.

Table 10. Participation in Professional Development by Type of Activity

	Type of Professional Development					
	Short/ Awareness	**Less Than 1 Day**	**1 Day to 1 Week**	**1 to Several Weeks**	**Long Term/ Periodic**	**Total**
Number of participants	14,830	5,528	6,371	1,331	336	28,396
Participants as percentage of total	52%	20%	22%	5%	1%	100%
Project participants as percent-age of total	20%	11%	9%	2%	1%	43%
Center participants as percent-age of total	32%	8%	13%	3%	0%	57%

Participation at the baccalaureate level is much less than for other categories (see Table 11). Involvement of business/industry in professional development is largely the domain of centers. Nearly three-fourths of all participants are in secondary or associate level institutions, and projects and centers about equally engage these participants in professional development.

Table 11. Participation in Professional Development (PD) by Type of Participant

	Type of Professional Development				
	Business/ Industry	Secondary	Associate	Baccalaureate	Total
Number of participants	6,264	9,961	10,419	1,752	28,396
Participants as percentage of total	22%	35%	37%	6%	100%
Participants in project PD as percentage of total	5%	18%	17%	4%	44%
Participants in center PD as percentage of total	17%	17%	19%	3%	56%

PROGRAM IMPROVEMENT

More than one-third of ATE PIs reported that they were significantly engaged in improving their education programs, where "programs" are defined as a sequence of courses, laboratories, and/or work-based experiences that lead students to one of the following outcomes: an appropriate degree, certification, or an occupational competency point.

Tables 12 and 13 present PI estimates for the past 12 months of 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 12 presents these numbers in terms of the overall ATE program, and Table 13 provides per-grant averages. Both tables break out the numbers by education level (secondary, associate, baccalaureate, and on-the-job). As is typical of data presented in other tables, the numbers are highest for the associate degree category. That education level accounts for more than 60 percent of the totals for each category (programs, locations, courses, and students) and 75 percent of all students engaged.

Table 12. Program Improvement Characteristics: Numbers of Programs, Program Locations, Courses, and Students Involved (n=57)

	Education Level				
	Secondary	Associate	Baccalaureate	On-the-Job	Total
Programs	83	241	22	34	380
Locations	61	181	20	20	282
Courses	265	911	95	48	1,319
Students	7,872	32,546	1,228	1,322	42,968

Table 13 shows it is at the associate degree level where the average program improvement effort (a) produces the greatest number of courses and (b) reaches the largest number of students. In other regards, the associate and secondary levels are comparable and larger in size and scope than on-the-job and baccalaureate program improvement efforts.

Table 13. Program Improvement Characteristics: Per Grant Average Numbers of Programs, Program Locations, Courses, and Students Involved (n=57)

	Education Level				
	Secondary	Associate	Baccalaureate	On-the-Job	Total
Programs	5.9	5.4	2.4	4.9	5.1
Locations	4.7	4.8	2.5	5.0	4.5
Courses	16.6	20.2	9.5	8.0	17.1
Students	393.6	678.0	94.5	264.4	499.6

Note. Reported averages in individual cells reflect responses from only those who reported conducting a specified activity (e.g., 14 respondents created 83 programs at the secondary level, which yielded a mean of 5.9).

Table 14 presents PIs' estimates of demographic information about student participants—persons who had taken at least 1 ATE course in the past 12 months. This information should be viewed with caution since students may choose not to volunteer this information, making accurate determination of some characteristics difficult to achieve. Note that a negligible number of students requested Americans with Disabilities Act (ADA) accommodations. Also, the new "incumbent workers" category shows that approximately a fifth of students were employed as technicians while enrolled in courses.

Table 14. Demographic Characteristics of ATE Students

	%
Male	69%
Female	31%
Hispanic/Latino	13%
American Indian/Alaska Native	1%
Asian	6%
Black/African American	15%
Native Hawaiian/Pacific Islander	0%
Multiracial	1%
Minorities	36%
White	64%
ADA	0%
Incumbent Workers (i.e., students who are employed as technicians at the same time they are taking coursework)	19%

Note. Incumbent workers is a new category for 2007.

Additional ATE fact sheets and reports for years 2000 to 2007 are available at www.wmich.edu/evalctr/ate/publications.