

**Assessing the Impact and Effectiveness of the
Advanced Technological Education (ATE) Program**

2004 Survey Results

**Volume II
Status of the ATE Centers**

Chris L. Coryn, Arlen R. Gullickson, and Carl E. Hanssen

**The Evaluation Center
Western Michigan University
Kalamazoo, MI 49008-5237**

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Contributors

Principal Authors Chris L. Coryn
..... Arlen R. Gullickson
..... Carl E. Hanssen

Principal Investigator Arlen R. Gullickson

Senior Associate/Co-Principal Investigator Frances Lawrenz

Project Manager/Co-Principal Investigator Carl E. Hanssen

Research Assistant/Data Analyst Chris L. Coryn
..... Daniela C. Schröter

Technology Specialists..... John Kapenga
..... Nate McFeters
..... Helio Vogel

Editor Sally Veeder

Executive Summary

The Advanced Technological Education (ATE) program is a federally funded program designed to educate technicians for the high-technology disciplines that drive the United States' economy. As stated in the ATE program guidelines,¹ this program:

Promotes improvement in technological education at the undergraduate and secondary school levels by supporting curriculum development; the preparation and professional development of college faculty and secondary school teachers; internships and field experiences for faculty, teachers, and students; and other activities

ATE funds three program tracks: projects, centers, and articulation partnerships. This report addresses the status of the ATE centers in regards to these program guidelines and is part of the larger effort to evaluate the ATE program. Presently, ATE funds three types of centers: National Centers of Excellence, which typically focus in one disciplinary area with the intent of making a national impact in that field; Regional Centers for Manufacturing and Technology, which are intended to have a local impact in key technological disciplines; and Resource Centers that are typically iterations of successful projects that are positioned to disseminate exemplary materials and provide support for other organizations engaged in technological education improvements.

This report, Volume II of the 2004 ATE Annual Survey Report, specifically addresses the following fundamental elements of the ATE Centers:

1. What are the size and scope of work for ATE centers?
2. To what degree do ATE centers apply rigorous internal practices in their operations?
3. How extensive are ATE center collaborations?
4. How productive are ATE centers in terms of the primary ATE work categories?
5. What impact are ATE centers having on students?

These questions are keyed to the primary evaluation indicators used to monitor the performance of ATE grantees. Additional questions, specifically the relative contribution of ATE centers as compared with the ATE projects, are addressed in Volume I of this report and through other evaluation products.

The 2004 ATE Survey contained seven sections, three required and four supplementary. The three required sections were (1) grantee characteristics, (2) organizational practices, and (3) collaboration. In addition to the three required survey sections, respondents were asked to complete additional sections based on their program's efforts. These four supplementary sections were directly aligned with the primary focus of ATE efforts: (1) materials development, (2) professional development, (3) program improvement, and (4) articulation agreements. Thus, the 2004 ATE Survey was structured as follows (also see the notes at the end of this report):

¹ Advanced Technological Education (2002). *Program Solicitation NSF-02-035*.

- I. Required sections
 1. Grantee Characteristics
 2. Organizational Practices
 3. Collaboration
- II. Supplementary sections
 4. Materials Development
 5. Professional Development
 6. Program Improvement
 7. Articulation Agreements

Although sections 4 through 7 were "supplementary," ATE program guidelines indicate that centers should engage in all of these activities. Therefore, these sections should have been completed by all of the responding centers, but were not. Twenty-one ATE centers responded to all or portions of the 2004 ATE Survey. Of these, 9 were National Centers of Excellence, 7 were Regional IT Centers, 1 was a Regional Manufacturing Center, and 4 were Resource Centers. Twelve (57%) centers completed the materials development section, 17 (81%) completed the professional development section, 15 (71%) completed the program improvement section, and 11 (52%) completed the articulation agreements section.

Size and Scope of the ATE Centers

The ATE centers are implementing the program as designed. The majority of centers (91%) are hosted by two-year colleges. Moreover, the centers are heavily engaged in the major categories of ATE work, that is, materials development (57%), professional development (81%), program improvement (71%), and articulation agreements (52%). The ATE centers are widely distributed across the United States. Moreover, 4,404 students completed center programs; 2,192 center students started or continued employment as technicians; and 1,221 center students started or continued STEM education (see Student Impact for more detailed information).

Internal Practices

The ATE centers are actively engaged in rigorous elements of operation such as program monitoring by NSF and the use of advisory committees and evaluative efforts. In addition, half of ATE centers reported conducting an assessment of workforce needs in the previous 12 months. Each of these internal practices is intended to guide and inform the efforts of the ATE centers.

Extent of Center Collaborations

Collaborative arrangements are in place with numerous external agencies and organizations as well as internally with the respondents' host institutions. Respondents reported 2,041 collaborative partnerships with ATE and non-ATE agencies, organizations, and/or institutions. These collaborative agreements serve a number of purposes including monetary and in-kind support, general program support, development of materials, professional development for educators, improving center programs, and articulation, among others.

Center Productivity in ATE Work Categories

Indicative of the ATE centers' size and scope of work, centers are producing vast quantities of materials, providing professional development opportunities for educators, developing programs across numerous locations, serving students, and providing students pathways to higher level technological education.

Student Impact

The ATE Centers are proactively and positively impacting students and the technological workforce of the United States through their efforts. That is, large numbers of students are completing center programs and continuing/starting employment as technicians or continuing/starting STEM education. Overall, the number of students completing center programs exceeds those who fail to complete (drop out) by an almost 2:1 ratio.

Overall Assessment

The ATE centers perform well in *setting the stage*, that is, that ATE-funded centers are consistent with the program's federal mandate. The centers are comprehensive in scope and are engaging in multiple ATE work-related activities, which emphasize a wide range of technological disciplines. This in turn leads to the application of sound organizational practices. These practices include employing advisory committees and evaluative efforts, as well as assessing workforce needs, for example. Moreover, strong cooperative efforts between the ATE centers and other institutions and organizations are occurring. Thus, the ATE centers are *setting the stage* for success.

In each of the four *program elements*—primary categories of work—a small number of ATE centers are excelling. By and large, single centers are highly productive in one or more of the work categories, inflating overall numbers (e.g., of the 10,000 professional development participants almost 7,000 were from a single ATE center). This occurred across all 4 categories of work (materials development, professional development, program improvement, and articulation agreements). Single, highly productive centers contribute substantially greater efforts and outcomes than the combined efforts of the others.

The ATE centers' achievement of *program goals*—to increase the number and quality of technicians in the United States and, as a result, positively impact the workforce in technological disciplines—is occurring, because the ATE centers are serving a large number of students. Yet, the number of female students enrolling in and completing center programs has declined from 2003 to 2004 (from 35% to 31%).

Recommendations

1. *Encourage the ATE centers to engage in programming in each of the 4 primary ATE work categories.* Evidence shows that this is not the case; only 38 percent of centers engage in all 4 work categories. Given the expectations that ATE centers provide comprehensive programming and the levels of funding that they receive, they are best positioned to integrate materials development, professional development, program improvement, and student articulation within the ATE program.
2. *Encourage the ATE centers to directly leverage the work of other ATE grantees and integrate this work into their programming.* Centers have a strong network of ATE collaborations that can be leveraged for these purposes. Individual centers can promote comprehensive programming by collaborating with specific ATE projects that may be more directly focused in one area (e.g., professional development) and then adapt and implement project programs at the center level.
3. *Encourage the ATE centers to increase advisory panel and evaluation expenditures.* Centers spend less than the NSF-recommended 5 percent on evaluation and less than \$7,000 per center annually for advisory panels. Increasing the investment in evaluation can help provide some of the hard evidence that is lacking about the effectiveness of center programs. For evaluation, this means budgeting between 7-10 percent of the grant for evaluation purposes. For advisory panels, this may constitute budgeting for honorariums and all meeting expenses.