The Evaluation Center

ADVANCED TECHNOLOGICAL EDUCATION PROGRAM EVALUATION
PROJECT IMPLEMENTATION: CHALLENGES AND RESOLUTIONS

Liesel A. Ritchie, Arlen R. Gullickson, and Chris L. S. Coryn
The Evaluation Center, Western Michigan University, 4405 Ellsworth Hall, Kalamazoo, MI 49008-5237
Telephone: 269-387-5895; E-mail: arlen.gullickson@wmich.edu
August 2006

Abstract

This brief examines the major challenges and resolutions associated with ATE project implementation, as reported by project and center principal investigators (PIs). Ten challenges were identified. Of these, "difficulty recruiting students," "changes in industry served," and "lack of institutional administrative support/interest," were identified as the most important. Examining projects and centers as two separate entities, "difficulty recruiting students" retained its number one ranking, although differences emerged in rankings between projects and centers in the remaining issues. There were also distinctions between ratings of challenges identified by PIs of 2- and 4-year institutions, with 2-year institutions ranking "difficulty recruiting students" as most important and 4-year institutions ranking "project/center staff/personnel turnover" as their greatest challenge. Overall, these findings suggest that a large majority of possible challenges to ATE project implementation were either not identified by PIs as important or had been at least partially resolved. Although the challenges discussed in this brief are important at the level of individual ATE projects and centers, none are substantial enough to raise concern on a programmatic level.

The 2006 Briefing Papers are prepared from survey census data collected in February and March 2006 from PIs of ATE projects and centers.[1] Each surveyed project/center was currently funded by the ATE program and had been funded for at least one year prior to the survey. The response rate for this survey was 92 percent (163 of 178 grantees in the sample). All PIs completed the survey section that addressed grantees' organizational management practices, from which the data presented in this briefing paper were drawn.

1. INTRODUCTION

This briefing paper focuses on project implementation challenges identified by PIs of ATE projects and centers in the past 12 months and the extent to which these challenges have been addressed. Section 2 examines overall rankings of challenges across projects and centers combined. Section 3 provides a more detailed breakdown of our survey data, examining distinctions in challenges identified by grantees at 2- and 4-year institutions as well as by project PIs and center PIs. Section 4 examines the extent to which PIs reported the challenges they identified as being resolved and considers these data in the context of the overall program. Section 5 reviews this year's challenges and resolutions in the larger picture of the ATE program in previous years.

[1] This briefing paper is based on data from the 2006 survey of ATE *projects* and Centers. For a description of the survey's sampling method, response rates, and overall findings, refer to the *Advanced Technological Education Program Fact Sheet* (Coryn, Ritchie, & Gullickson, 2006).

2. PROJECT IMPLEMENTATION CHALLENGES REPORTED BY ATE PIS

One hundred sixty-three PIs identified 3 challenges faced by their project or center in the past 12 months from a list of 10 issues that were developed from responses to qualitative items on the 2000-2005 surveys (see Table 1). They rank ordered these specified challenges via ratings from 1 to 3, where 1 was the greatest challenge, 2 was the next greatest challenge, and 3 was the third greatest challenge. We developed overall rankings of challenges, where an issue ranked 1 was given 3 points, a ranking of 2 was given 2 points, and a ranking of 3 was given 1 point. That is, the challenge ranked 1 received 3 times as many points as the challenge ranked third. This approach yielded scores for each identified challenge. As shown in Table 1, the rankings of the top 5 or 6 issues were relatively stable. As the number of ratings received by a challenge and the number of points accumulated decreased, so too did the stability of the ratings, resulting in many near ties in rankings near the bottom.

Clearly, the challenge considered most serious by PIs is student recruitment. More than half of all PIs (56%)

indicated they had difficulty recruiting students. Additionally, more than double the proportion of PIs regarded this among their greatest challenges when compared with the second- and third-ranked challenges—"changes in industry served by your project/center" (24%) and "lack of institutional administrative support/interest" (24%). The fourth and fifth ranked challenges of "project/center staff/personnel turnover" and "lack of financial resources" closely followed with 21 percent and 23 percent, respectively, of PIs indicating these were challenges.

Table 1.
Challenges as Rated by 163 ATE Grantees

Rank	Challenge	Sum of Ratings (score)	Number of Ratings *N*	*P*
1	Difficulty recruiting students	150	91	56%
2	Changes in industry served by your project/center	92	39	24%
3	Lack of institutional administrative support/interest	81	39	24%
4	Project/center staff/personnel turnover	69	34	21%
5	Lack of financial resources	64	37	23%
6	Lack of support/interest from business and industry	60	27	17%
7	Lack of qualified instructors	58	28	17%
8	Lack of necessary instructional resources	56	24	15%
9	Faculty/instructor turnover	54	27	17%
10	Difficulty acquiring student job placement data	47	21	13%

3. Distinctions in Challenges Cited by Projects, Centers, and Type of Host Institution

Using the same scoring process described in the previous section, it is possible to compare overall rankings of implementation challenges identified by projects and centers. This comparison reveals substantial differences between them, although the actual *number* of PIs citing each respective challenge—particularly for the 35 reporting centers—is often quite low. That is, these rankings account only for those from the entire population of surveyed projects and centers who identified these issues as a challenge. With this in mind, projects and centers both regarded "difficulty recruiting students" as their greatest challenge (see Table 2). However, as illustrated in Figure 1, a larger proportion of project PIs (58%, *N* = 74) than center PIs (49%, *N* = 17) did so. The other common challenge cited by grantees when comparing the overall top 5 rankings of projects and centers is "changes in industry served by your project/center," with a ranking of third among projects and second among centers. The proportion of center PIs (37%, *N* = 13) ranking this challenge as one of their greatest was almost double that of project PIs (20%, *N* = 26).

Table 2.
Comparison of Challenges
as Ranked by Projects and Centers

Ranking by Projects	Challenge	Ranking by Centers
1 (*N* = 74)	Difficulty recruiting students	**1** (*N* = 17)
2 (*N* = 34)	Lack of institutional administrative support/interest	**7** (*N* = 5)
3 (*N* = 26)	Changes in industry served by your project/center	**2** (*N* = 13)
4.5 (*N* = 26)	Faculty/instructor turnover	**10** (*N* = 1)
4.5 (*N* = 26)	Lack of qualified instructors	**8** (*N* = 4)
6 (*N* = 24)	Lack of support/interest from business/industry	**9** (*N* = 3)
7 (*N* = 24)	Project/center staff/personnel turnover	**5.5** (*N* = 8)
8 (*N* = 24)	Lack of financial resources	**5.5** (*N* = 13)
9 (*N* = 15)	Lack of necessary instructional resources	**3** (*N* = 9)
10 (*N* = 11)	Difficulty acquiring student job placement data	**4** (*N* = 10)

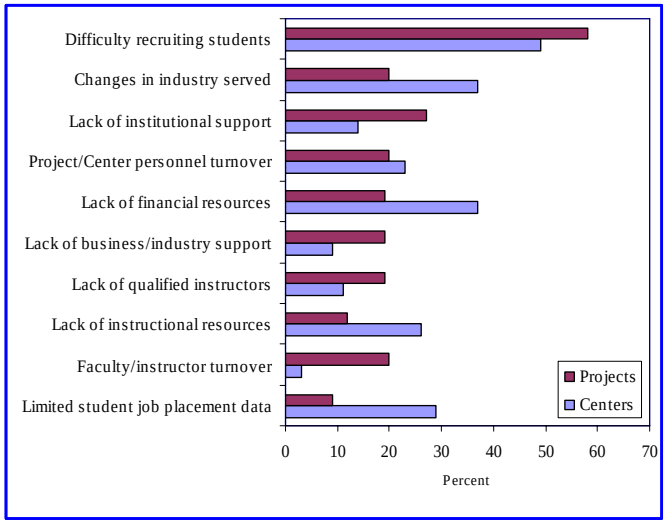

Figure 1.
Comparison of Challenges as Ranked by Proportions of Projects/Centers

There are additional differences between projects and centers in the remaining overall challenges. Looking first at the challenges ranked in the top 5 by projects, slightly more than one-quarter of project PIs (27%, *N* = 34) ranked "lack of institutional administrative support/interest" as their second greatest challenge. In comparison, just 14 percent (*N* = 5) of center PIs regarded this as a challenge with an overall ranking of

seventh. One could surmise that this is a function of grant size—that because center funding is higher, lasts longer, and is quite prestigious, administrators at center institutions are more likely to take an interest and be more supportive. Moreover, ATE guidelines require that centers demonstrate capacity to build and maintain support from business and industry during the proposal development process, a strong incentive to address this challenge prior to project funding and implementation. Finally, tied for fourth among project challenges (denoted as 4.5 in Table 2) were faculty/instructor turnover" (20%, *N* = 26) and "lack of qualified instructors" (20, *N* = 26). These issues were ranked tenth (3%, *N* = 1) and eighth (11%, *N* = 4), respectively, by centers. More than double the proportion of projects (19%, *N* = 24) than centers (9%, *N* = 3) cited "lack of support/interest from business/industry"—ranked sixth overall by projects and ninth by centers—as a difficulty. Included in the overall top 5 challenges for centers were "lack of necessary instructional resources," "difficulty acquiring student job placement data," and "lack of financial resources." None of these issues were among the top 5 challenges for projects. Ranked third by 26 percent (*N* = 9) of center PIs, "lack of necessary instructional resources" was ninth according to ratings provided by 12 percent (*N* = 15) of project PIs. The fourth-ranked challenge for centers (29%, *N* = 10)—"difficulty acquiring student job placement data"—was tenth among projects. "Lack of financial resources" and "project/center staff/personnel turnover" tied for fifth according to rankings provided by center PIs (denoted as 5.5 in Table 2). These were ranked eighth and seventh, respectively, by project PIs.

As shown in Table 3 and Figure 2, there are also notable differences in some of the challenges reported by 2- and 4-year institutions. Keeping in mind that only 20 of the 163 reporting PIs represented 4-year institutions and 124 represented 2-year institutions, a larger proportion of 2-year institutions (65%, *N* = 80) than 4-year institutions (45%, *N* = 9) reported difficulty recruiting students. "Changes in industry served by your project/center" were also considered a greater challenge by 2-year institutions (24%, *N* = 30) than by 4-year institutions (10%, *N* = 2). However, a much greater proportion of 4-year institutions than 2-year institutions experienced challenges with "project/center staff/personnel turnover" (50%, *N* = 10 and 17%, *N* = 21, respectively) and "lack of institutional administrative support/interest" (35%, *N* = 7 and 23%, *N* = 29, respectively).

Table 3.
Comparison of Challenges as Ranked by 2-Year and 4-Year Institutions

Ranking by 2-Year Institutions	Challenge	Ranking by 4-Year Institutions
1 (*N* = 80)	Difficulty recruiting students	**3** (*N* = 9)
2 (*N* = 30)	Changes in industry served by your project/center	**7** (*N* = 2)
3 (*N* = 29)	Lack of institutional administrative support/interest	**2** (*N* = 7)
4 (*N* = 21)	Lack of support/interest from business/industry	**9** (*N* = 3)
5 (*N* = 26)	Lack of financial resources	**6** (*N* = 3)
6 (*N* = 19)	Lack of necessary instructional resources	**7** (*N* = 3)
7 (*N* = 21)	Project/center staff/personnel turnover	**1** (*N* = 10)
8 (*N* = 22)	Lack of qualified instructors	**4** (*N* = 4)
9 (*N* = 20)	Faculty/instructor turnover	**5** (*N* = 1)
10 (*N* = 17)	Difficulty acquiring student job placement data	**7** (*N* = 3)

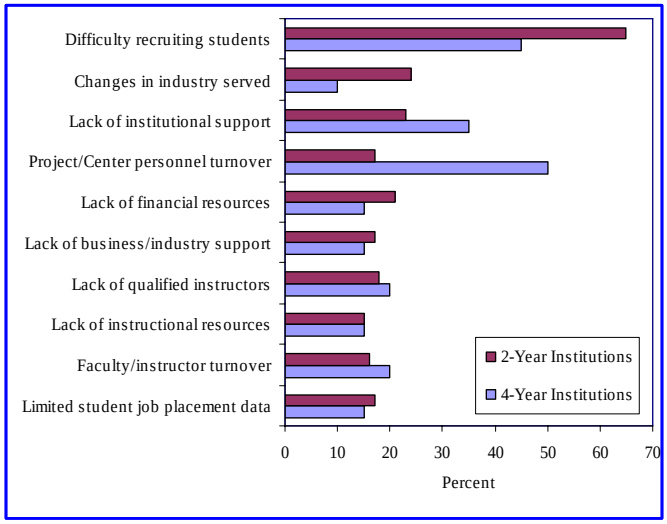

Figure 2.
Comparison of Challenges as Ranked by Proportions of 2-Year and 4-Year Institutions

4. Extent of Challenge Resolution as Reported by PIs

Perhaps more important than the types of challenges faced by ATE grantees is the extent to which the PIs consider the challenges they cited as having been resolved. For each challenge PIs ranked as 1, 2, or 3 on the survey, they were then asked to indicate whether the issue had been "not resolved," "partially resolved," or "fully resolved." Overall, most PIs indicated that their challenges had been partially or fully resolved. Additionally, in the context of the entire portfolio of

reporting ATE projects and centers (N = 163), the greatest challenge—difficulty recruiting students— has been at least partially resolved or was not identified as an issue at all by 83 percent of grantees (see Table 4). That is, just 17 percent (N = 27) of all grantees reported that they continue to struggle with student recruitment. As shown in Table 4, most of the possible challenges were either not identified by PIs as an issue at all or had for the most part been resolved. For additional perspective, focusing on projects and centers that identified issues as a challenge, Figure 3 presents the extent to which respondents indicated the challenges they experienced have been resolved.

Table 4.
Extent to Which the Five Most Serious Challenges Have Been Resolved by Projects and Centers Combined

		Rating			
		Not an Issue	Not Resolved	Partially Resolved	Fully Resolved
Rank	Challenge	*P*	*P*	*P*	*P*
1	Difficulty recruiting students	50%	17%	29%	4%
2	Changes in industry served by your project/center	80%	5%	12%	3%
3	Lack of institutional administrative support/interest	78%	6%	15%	1%
4	Project/center staff/personnel turnover	81%	1%	12%	6%
5	Lack of financial resources	81%	8%	10%	1%

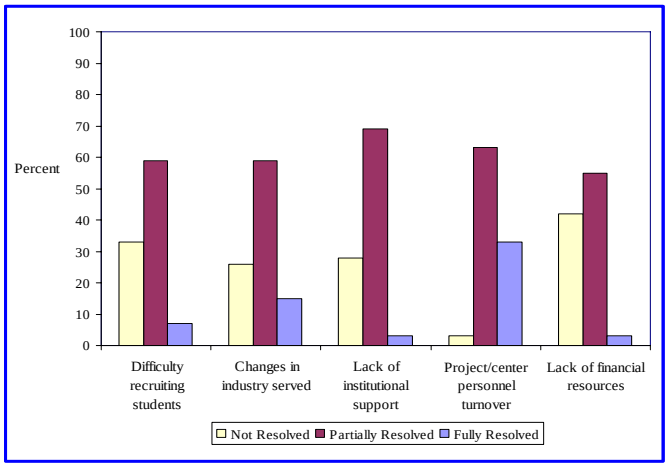

Figure 3.
Extent of Challenge Resolution by Projects and Centers Ranking Issues as Important

5. Summing Up and Recommendations

The challenges reported by ATE grantees are not entirely surprising. They are consistent with issues described in pertinent literature, as well as those encountered by grantees in the ATE program over the years. For example, student recruitment—identified as the overall primary challenge—has been an issue for projects and centers since we began evaluating the ATE program. Indeed, student recruitment emerges as a "major inhibitor" in grantees' program improvement efforts (Coryn, Gullickson, & Ritchie, 2006a). Moreover, in 2002, a team of evaluators prepared a monograph of "Issues for Consideration" for the ATE program that included a chapter on recruitment and retention. With respect to recruitment, *information* that "communicate[s] the local, regional, or national need for graduates in a specified field with concomitant career and benefit opportunities" was deemed instrumental in attracting students to advanced technology careers via college education (Gullickson, Lawrenz, & Keiser, 2002, p. 110).

As noted throughout this brief, we should not overstate the seriousness of the challenges cited by ATE PIs. The total numbers of respondents indicating that an issue was a challenge were relatively low with respect to the overall population of 163 projects and centers. Generally speaking, it appears that grantees have adopted successful strategies to either keep from encountering these difficulties during project implementation or have found ways to resolve challenges that did emerge. Although the challenges discussed in this brief are important at the level of individual ATE projects and centers, none are substantial enough to raise concern on a programmatic level.

For those who did report difficulty recruiting students among their unresolved challenges, we recommend that they refer to other papers in this 2006 series (Coryn, Gullickson, & Ritchie, 2006a, 2006b; Gullickson, Coryn, & Ritchie, 2006a, 2006b; Ritchie, Gullickson, & Coryn, 2006). In particular, ATE personnel and grantees might consider how quality workforce needs assessment data might enhance recruitment activities, as well as address the challenge of "changes in industry served"—also a challenge for both projects and centers (see Ritchie, Gullickson, & Coryn 2006). The challenge cited as fourth by center PIs—"lack of student job placement data"—might also be ameliorated with better baseline workforce needs assessment data, which could help with tracking students placed in a given arena.

We further suggest that ATE personnel follow up with center PIs to learn more about the difficulties they face with respect to "lack of necessary instructional resources," which was ranked the third greatest challenge among centers. It would seem that clarification regarding what types of instructional resources are lacking would be relatively easy to obtain and, perhaps, relatively straightforward to address.

Finally, we strongly recommend that strategies for addressing challenges that are common among grantees be highlighted and communicated at the annual PI conference. These challenges are not new to the ATE program, but they likely are new to some grantees who may yet be a part of our annual data collection process. We believe that the ATE program can further facilitate communication among grantees and continue to educate the leadership of new projects and centers in the coming years.

REFERENCES

Coryn, C. L. S., Gullickson, A. R., & Ritchie, L. A. (2006a). *Contributors and inhibitors influencing program improvement*. Advanced Technological Education Program Evaluation Briefing Paper Series, Briefing Paper #2. Kalamazoo: Western Michigan University, The Evaluation Center.

Coryn, C. L. S., Gullickson, A. R., & Ritchie, L. A. (2006b). *Contributors and inhibitors influencing articulation agreements.* Advanced Technological Education Program Evaluation Briefing Paper Series, Briefing Paper #4. Kalamazoo: Western Michigan University, The Evaluation Center.

Coryn, C. L. S., Ritchie, L. A., & Gullickson, A. R. (2006). *Advanced Technological Education program fact sheet*. Kalamazoo: Western Michigan University, The Evaluation Center.

Gullickson, A. R., Coryn, C. L. S., & Ritchie, L. A. (2006a). *Project evaluation*. Advanced Technological Education Program Evaluation Briefing Paper Series, Briefing Paper #1. Kalamazoo: Western Michigan University, The Evaluation Center.

Gullickson, A. R., Coryn, C. L. S., & Ritchie, L. A. (2006b). *Materials development, professional development, and program improvement: Productivity and quality*. Advanced Technological Education Program Evaluation Briefing Paper Series, Briefing Paper #6. Kalamazoo: Western Michigan University, The Evaluation Center.

Gullickson, A. R., Lawrenz, F. P., & Keiser, N. (Eds.). (2002). *The ATE program: Issues for consideration: A monograph*. Arlington, VA: National Science Foundation.

Ritchie, L. A., Gullickson, A. R., & Coryn, C. L. S. (2006). *Workforce needs assessment*. Advanced Technological Education Program Evaluation Briefing Paper Series, Briefing Paper #3. Kalamazoo: Western Michigan University, The Evaluation Center.

Additional briefing papers are available at www.wmich.edu/evalctr/ate/publications