



# ADVANCED TECHNOLOGICAL EDUCATION PROGRAM EVALUATION CONTRIBUTORS AND INHIBITORS INFLUENCING PROGRAM IMPROVEMENT

Chris L. S. Coryn, Liesel A. Ritchie, and Arlen R. Gullickson  
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 contributors and inhibitors influencing ATE projects' program improvement activities. Sixteen factors (i.e., issues) were identified that potentially contribute, either positively or negatively, to program improvement by ATE projects. Of these, "student enrollment," "student retention," and "demand by business and industry" stood out as the most important. Student enrollment emerged as both a contributor and inhibitor, whereas student retention and business and industry demand were strongly positive (i.e., contributors to improvement). Overall, these findings suggest that student enrollment is more likely to be an inhibitor in matters of recruitment and a contributor in terms of retention and graduation/placement. As important as these factors may be for ATE individual 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 principal investigators (PIs) of ATE projects and centers.<sup>1</sup> 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). Only grantees that were significantly engaged in program improvement were required to complete the survey section dedicated to that specific activity. For centers, the criterion for significant engagement was that  $\geq$  \$100,000 of their direct costs in the past 12 months was allocated specifically for that activity. For projects, the criterion was that  $\geq$  30 percent of their direct costs was allocated specifically to the activity. Forty-one percent (67 of 163) of PIs reported that they were significantly engaged in program improvement endeavors. Of these, 27 percent (18 of 67) were centers and 73 percent (49 of 67) were projects. However, no comparisons are made here between them.

## 1. WHAT ARE GRANTEES DOING IN TERMS OF PROGRAM IMPROVEMENT?

This brief focuses on the major issues facing ATE grantees in terms of their program improvement efforts. The goals of this briefing paper are to (a) describe grantees' program improvement efforts, (b) identify and rank order the key issues related to program improvement, (c) determine whether the highest ranked issues are contributors or inhibitors to program improvement, and (d) extract lessons that can be learned from these contributors and inhibitors.

Program improvement is intended to "increase the relevance of technician education to modern practices

and assure an increased number of students entering the high performance workplace with enhanced competencies" (National Science Foundation, 2005, p. 6). Essentially, program improvement leads to better courses or programs, where "programs" were a series of courses designed to lead to a specific degree or certification and "courses" were components of programs. PIs who reported that they were significantly engaged in improving their programs reported that they were developing or improving 302 programs at 283 locations, consisting of 956 courses and serving 28,200 students. As Table 1 shows, the large majority of this work was located at associate degree institutions and created to serve students at that level.

Table 1.  
Program Improvement Facts

	Education Level			On-the-Job	Total
	Secondary	Associate	Baccalaureate		
Programs	57	197	21	27	302
Locations	61	165	23	34	283
Courses	52	790	60	54	956
Students	2,719	23,913	289	1,279	28,200

<sup>1</sup> This briefing paper is based on survey 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), *ATE Indicators of Productivity: Six-Year Trends 2000-2005* (Gullickson, Coryn, & Hanssen, 2006), and *2005 ATE Technical Report: Processes, Procedures, and Results* (Coryn & Hanssen, 2005).

As reported in the sixth brief in this series (Gullickson, Coryn, & Ritchie, 2006), both centers and projects, on average, rated the quality of their program improvement efforts in the past 12 months as “very good” (centers  $M = 4.33$ ,  $SD = 0.39$ ; projects  $M = 4.40$ ,  $SD = 0.49$ ).<sup>2</sup> “Less than a majority, 33 percent of centers and 40 percent of projects, rated the quality of their program improvement efforts as “excellent.” Unlike both materials development and professional development, centers rated the quality of their program improvement efforts lower than projects” (Gullickson, Coryn, & Ritchie, 2006, p. 4).

## 2. KEY ISSUES

Sixteen factors (i.e., issues) were identified from prior surveys as potential inhibitors or contributors to grantees’ program improvement work. The identification process used to identify these issues was largely a thematic analysis of qualitative data obtained from prior surveys. The predominant issues are shown in the order in which they appeared in the survey:

- Student enrollment
- Student retention through program completion
- Institutional course approval
- Institutional program approval
- Faculty support and advocacy
- Quality of instructors
- Faculty turnover
- Support from college administrators
- External funding
- Demand by business and industry
- Cost to maintain/update
- National economic trends
- Emergence of newer technologies
- Stability of institutional funding
- Partnership with external stakeholders
- Ability to generate revenue to support the program

## 3. RANKINGS OF KEY ISSUES

PIs were asked to select and rank order the top 3 issues relevant to their project’s program improvement from the 16 issues, where 1 was “most important,” 2 was the “next most important,” and 3 was the “third most important.” Thus, each PI was given three “votes” to cast in terms of what they perceived as the key issues inhibiting or contributing to their program improvement efforts. In all, 67 ATE PIs provided rankings.

<sup>2</sup> Where 1 = poor; 2 = fair; 3 = good, average; 4 = very good; and 5 = excellent.

The rank order of the key issues was determined in two ways. First, each issue was assigned points, where a ranking of 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 first most important issue received three times as many points as the third most important. The score for each factor was then summed across all respondents to generate a total score. Second, if a respondent selected and ranked an issue (i.e., 1, 2, or 3) it was coded as 1; if not, it was coded as 0.

The two procedures produced comparable though not identical orderings of the list of issues. The first procedure gave greatest weight to those items ranked highly, while the second procedure gives all selected items equal weight. As shown in Table 2, the two methods yielded identical rankings for the top nine factors. Additionally, the number of ratings column shows that no factor was selected by a majority of PIs. In fact, the student enrollment factor, which stands out as the number 1 priority issue, was selected by 39 percent. By the eighth factor, faculty turnover, just 10 percent of the PIs listed it as a priority issue. Only the top two factors, student enrollment and demand by business and industry, captured 30 percent or more of the votes as priority issues.

Table 2.  
Rankings of Key Issues

Rank	Issue	Sum of Ratings (score)	Number of Ratings	
			<i>N</i>	<i>P</i>
1	Student enrollment	65	26	39%
2	Demand by business and industry	39	20	30%
3	Student retention	33	15	22%
4	Faculty support and advocacy	30	14	21%
5	Quality of instructors	26	13	19%
6	Partnership with external stakeholders	19	12	18%
7	Support from college administrators	18	10	15%
8	Faculty turnover	13	7	10%
9	External funding	12	6	9%
10	Ability to generate revenue	9	4	6%
11	Emergence of newer technologies	6	5	7%
12	Stability of institutional funding	6	4	6%
13	Institutional program approval	5	2	3%
14	National economic trends	3	3	4%
15	Cost to maintain/update	2	1	1%
16	Institutional course approval	0	0	0%

Note. Rankings of “most important issue” (1) was scored as 3, “second most important issue” (2) was scored as 2, and “third most important issue” (3) was scored as 1.

Two aspects appear important here. First, two factors, student enrollment and demand by business and industry, stand out as important factors. They are identified as important by roughly a third or more of the

PIs. Second, the other factors do not emerge as major issues for projects. Rather, some PIs rated each issue as important, but those ratings were widely scattered across the remaining 14 items. Only institutional course approval was not selected by at least one PI as an important issue. None of these remaining issues were identified as important by a quarter of the PIs.

Based on those rank orderings and percentages of individuals identifying individual factors as priorities, we looked more closely at just the top two ranked items.

#### 4. ARE THE KEY ISSUES CONTRIBUTORS OR INHIBITORS TO PROGRAM IMPROVEMENT?

In addition to casting their votes for the factors they saw as being important to their program improvement efforts, PIs were also asked to rate the extent to which each of their voted factors was an inhibitor or contributor to improving their program. These were 1 = major inhibitor, 2 = inhibitor, 3 = uncertain, 4 = contributor, and 5 = major contributor. Ratings for the eight top ranked factors are summarized in Table 3. Note that the sample size for each factor varies from a high of 23 for the highest ranked factor to a low of 5 for the 8<sup>th</sup> ranked factor. These differing sample sizes occurred because each PI rated only the 3 factors he or she selected as important—26 persons selected student enrollment as an important factor and 23 of the 26 rated its role on the inhibitor to contributor continuum.

Table 3.  
Summary of Issues as Inhibitors  
and Contributors to Program Improvement

Rank	Issue	Major Inhibitor	Inhibitor	Contributor	Major Contributor
1	Student enrollment ( <i>n</i> = 23)	9%	26%	9%	26%
2	Demand by business and industry ( <i>n</i> = 15)	0%	18%	9%	67%
3	Student retention ( <i>n</i> = 11)	0%	18%	9%	64%
4	Faculty support & advocacy ( <i>n</i> = 11)	0%	9%	27%	55%
5	Quality of instructors ( <i>n</i> = 10)	10%	0%	0%	90%
6	Partnership with external stakeholders ( <i>n</i> = 11)	0%	0%	36%	64%
7	Support from college administrators ( <i>n</i> = 8)	13%	25%	0%	38%
8	Faculty turnover ( <i>n</i> = 5)	40%	40%	20%	0%

Note. Row totals do not necessarily equal 100 percent, because the rating option of “uncertain” is not included in this table.

Table 3 suggests that student enrollment can be boon to the project or a problem to overcome. In like manner, if

“support from college administrators” was selected as important, it was equally likely to be viewed as a contributor or inhibitor of the grant work.

On the strongly positive side, “partnership with external stakeholders” was always viewed as an important contributor, and “quality of instructor” was almost always similarly viewed as a contributor. Both “demand by business and industry” and “student retention” were most often viewed as contributors. Only “faculty turnover” was most often viewed as an inhibitor. To a large extent we view these findings as consistent with what one would expect in the normal course of project/center work.

The student enrollment factor emerged as most important of all 16 factors and also evenly split as a contributor and inhibitor. When student enrollment has been addressed in other settings (e.g., site visits), enrollment considerations typically divided into 3 parts: recruitment, retention, and graduation/placement. The findings shown in Table 3 suggest that relationships with business and industry are quite positive (a plus for placement upon graduation or certification). Additionally, when identified as important, student retention most often is viewed as major contributing factor. Those findings combined with the bipolar character of student enrollment suggest that student enrollment is more likely to be an inhibitor in matters of recruitment and a contributor in matters of retention and graduation/placement. Of course, other factors not included in this paper, such as knowledge and skills of student enrollees, could also be affecting PI ratings on this factor.

#### 5. OVERALL CONCLUSIONS AND RECOMMENDATIONS

Overall, these findings suggest that PIs conducting program improvement work individually address an array of factors to conduct their work effectively. In our initial ranking (Table 1), just two factors met what we considered to be minimal criteria of importance. When examined more fully to determine whether these factors were viewed as inhibitors or contributors, only student enrollment stands out as a potential problem. For that factor our best guess is those that view student enrollment as a problem are likely to incur the problems in matters of recruitment. Yet, we note that just one-eighth of the total sample (8 of 67) labeled student enrollment as a key factor and an inhibitor.

As important as these individual factors may be for the respective projects and centers, we believe that none rises to a point of importance as a factor and inhibitor

substantial enough to be addressed on a programmatic level for ATE as a whole. Indeed, the overall message in these findings is that in matters of program improvement, projects are meeting the obstacles and find that most factors of importance are contributors to their work. That's quite a positive sign for the program.

## REFERENCES

Coryn, C. L. S., & Hanssen, C. E. (2005). *2005 ATE technical report: Processes, procedures, and results*. Kalamazoo: Western Michigan University, The Evaluation Center.

Coryn, C. L. S., Gullickson, A. R., & Ritchie, L. A. (2006). *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., & Hanssen, C. E. (2006). *ATE indicators of productivity: Six-year trends 2000-2005*. Kalamazoo: Western Michigan University, The Evaluation Center.

Gullickson, A. R., Coryn, C. L. S., & Ritchie, L. A. (2006). *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.

National Science Foundation. (2005). *Advanced Technological Education (ATE) program solicitation* [NSF 05-530]. Arlington, VA: Author.

*Additional briefing papers are available at [www.wmich.edu/evalctr/ate/publications](http://www.wmich.edu/evalctr/ate/publications)*