The Use of Workforce Assessment as a Component of Career and Technical Education Program Evaluation

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Abstract

This research project examined the extent to which Career and Technical Education (CTE)-related programs use workforce needs assessment as a component of their evaluation activities. An employer perspective was used to develop a conceptual framework drawing on strategic human resource management theory. The extent and methods utilized for workforce needs assessment activities associated with a national CTE program were examined using data from the annual evaluation study of the Advanced Technological Education (ATE) program funded by the National Science Foundation. The findings showed that only one-half of the ATE projects with a specific CTE occupational focus engaged in workforce needs assessment. The most frequently reported approach for workforce assessment was the use of secondary data from existing sources. The use of primary data collected from business and industry as well as other constituent groups was examined in more detail. The most frequently used primary methods for workforce needs assessment were advisory committees followed by gathering anecdotal information and the use of formal and structured survey questionnaires and interviews. Recommendations are made for the expanded use of workforce needs analysis in CTE policy, practice, and research.

Keywords: workforce assessment, CTE evaluation, human resource training and development

Introduction

The rapid changes and dynamic nature of jobs in technology-related occupations is a pressing concern for policymakers, educators, and training providers as well as ultimately employers (Anderson, 1999; Harkins, 2002). At a minimum, employers rely on career and technical education (CTE) and workforce training systems to supply workers able to perform in their jobs (Rojewski, 2002). Consequently, education providers and the funders of education programs are increasingly interested in the evaluation and assessment of student learning as well as the degree to which this provides students the needed knowledge, skills, and abilities to gain entry into and subsequently perform in the labor market.

One example of a systematic education and training program recognized as providing leadership for a wide variety of CTE-related occupations is the Advanced Technological Education (ATE) program. The ATE program was established by the National Science Foundation (NSF) in response to the Scientific and Advanced Technology Act of 1992 (U.S. Congress, PL 102-476). The goal of the act was to establish a national advanced technician

training program, utilizing the resources of the nation's two-year associate degree-granting colleges primarily to provide targeted learning leading toward high demand technology-related occupations (Gullickson, Wingate, Lawrenz, & Coryn, 2006). The most recent solicitation for proposals (National Science Foundation, 2010a) described the focus of the program as follows:

With an emphasis on two-year colleges, the Advanced Technological Education (ATE) program focuses on the education of technicians for the high-technology fields that drive our nation's economy. The program involves partnerships between academic institutions and employers to promote improvement in the education of science and engineering technicians at the undergraduate and secondary school levels. The ATE program supports curriculum development; professional development of college faculty and secondary school teachers; career pathways to two-year colleges from secondary schools and from two-year colleges to four-year institutions; and other activities. Another goal is articulation between two-year and four-year programs for K-12 prospective teachers that focus on technological education. The program also invites proposals focusing on research to advance the knowledge base related to technician education. (p. 2)

Since the establishment of this program, almost 900 ATE projects have been funded by the NSF (National Science Foundation, 2010a). Although the ATE program has been the focus of much evaluation activity (see Gullickson & Hanssen, 2006; Gullickson & Wingate, 2008; Gullickson, et al., 2006; Lawrenz, Keiser, & Lavoie, 2003; Zinser & Lawrenz, 2004), studies that addresses the perspectives of employers and the predicted characteristics of the future workforce have received far less attention. A workforce needs assessment seeks to examine the future characteristics of work and the human resources needed with the focus at an organizational, industry, or societal level (Mojsilović, & Connors, 2010). While some areas of CTE have used the perspectives of employers and future workforce projections for curriculum design, student assessment, and program evaluation (for example, National Occupational Competency Testing Institute 2007; Munyofu, 2008), studies that examine the extent and methods of workforce needs assessment as a component of formal evaluation efforts is limited. This study attempted to address that concern.

Evaluation has long been a recognized component of CTE and occupational training programs (Wentling & Lawson, 1975). Rojewski (2002) noted that accountability has become a hallmark of education reform initiatives including those in CTE. He further described the role of federal funding and legislation in driving evaluation approaches but noted that "criticisms exist about the criteria and methodology used to collect data, and the usefulness of evaluation results" (p. 24). Others have called for employer feedback to play a key role in the evaluation of education programs that have a work emphasis (Copa & Wolff, 2002). Yet, few studies have examined workforce assessment data explicitly as a component of CTE evaluation. In the following sections of this paper, the conceptual framework in which the study was embedded is presented. The study uses aspects of strategic human resource management theory with core concepts and theories from evaluation to frame workforce needs assessment. A review of supporting literature is provided. The research methods, including a description of the survey research from which the secondary data were drawn for this study are described. The results are presented followed by the conclusions drawn for CTE researchers, policymakers, educators, and evaluators.

Conceptual Framework and Review of Literature

A cross-disciplinary, boundary-spanning approach to CTE workforce assessment was adopted for this study. The rationale supporting this approach was the belief that concepts and theories from the broadly defined area of organizational science could be useful for considering the role of workforce needs assessment as a component of the evaluation of CTE. In addition to the existing research on CTE evaluation, the researchers wished to ground the study in theory that captures the realities of the workplace. Put another way, the intent was to examine the issue from an organizational or employer perspective, as opposed to only considering the educator or training delivery perspective. Although the overlapping needs of conducting effective CTE evaluation useful to program funders and educators as well as employers is acknowledged. Adopting an employer approach to CTE evaluation required a review of a broad body of literature from a diverse range of disciplines and fields including strategic human resource management, CTE, and evaluation. A brief review of related literature that helped frame this study follows.

Strategic Human Resource Development

Strategic management has a focus on planning for optimal allocation and management of scarce resources in competitive and constantly changing environments to achieve organizational goals (Hill & Jones, 1995). As strategic management gained popularity, it developed distinctive levels of theory and application with links being formed between the overall organizational strategy and the strategies of various business components and functions. Strategic plans were developed for marketing, production, finance, capital acquisition, and so forth. The link between organizational strategy and the management of human resources fostered strategic human resource management.

A strategic human resource management approach describes "all that is necessary to position an organization in a way that will assure its long-term survival in a competitive environment" (Dobson & Starkey, 1993, p. 3). Strategic human resource management theory combines a heavy emphasis on the external environment associated with organizational level strategic planning with current and future actions involved in the management of human resources for the purpose of achieving organizational goals (Jackson & Schuler, 1995). Previous studies have determined that high performing organizations can be distinguished to the extent they adopt a strategic human resource management approach to prepare for future fluctuations in external environments and the alignments needed with their current and future workforce (Huselid, 1995).

Organizations adopting a strategic human resource approach acknowledge that future workforce planning at the organizational level must be aligned with the mission of the firm and the changes occurring within the external environment (Barney & Wright, 1998). The same argument can be made for workforce planning at the industry level where the principal mission and delivery of core products or services of many organizations must be aligned with changes in the external environment. This need for planning to address external environmental changes and the impacts on the education, skills, and knowledge needed by the future workforce is especially pressing in dynamic industries (Pettus, Kor, & Mahoney, 2009), which characterizes many of the technology-related occupations associated with the ATE program.

A number of theoretical frameworks and models for the strategic development of human resources have appeared in the literature (Gilley, Quatro, & Lynham, 2003). Although each

framework has somewhat differing features, almost all share a method for assessing future characteristics of the workforce and the knowledge, skills, and abilities workers will need as well as determining an appropriate strategic response. Generally, this involves an examination and assessment of the external factors that may create change through a process designed to identify key characteristics of an industry's environment to monitor significant trends to formulate appropriate managerial actions (Craft, 1988; Rothwell & Kazanas, 1994). Managerial actions can include involvement in workforce education issues for future workers as well as training and development for current employees.

Needs Assessment

Needs assessment can be thought of as a type of evaluation (Gupta, Sleezer, & Russ-Eft, 2007). Russ-Eft and Preskill (2005) identified needs assessment as a factor that affects the success and outcomes of a systematic approach to evaluation. Gupta et al. defined needs assessment as a method that "frames the problems or opportunities of interest and builds relationships among the people and groups who have a stake in the issue" (p. 20). As such, it relies on "insider" information about the situation.

Workforce needs assessment can be conducted at the level of an individual organization, multiple organizations, industries, or geographic regions to identify the future characteristics of work and the workers needed. A partnership approach between those educating and training the future workforce with the employers who will rely on these human resources characterizes the process. This type of partnership supports an ongoing concern to connect the evaluation of education to the employment needs of the workforce (Bailey, 1991). An increasingly diverse range of disciplines and occupational areas are engaging in workforce needs assessment with recent examples including professional geographers (Solem, Cheung, & Schlemper, 2008), public health nutrition workers (Hughes, 2003), and information technology technicians (Caputo, Kovacs, & Turchek, 2006).

To date, little evidence exists of studies in CTE that have adopted a strategic human resource management approach specifically for examining future workforce needs and then capturing these data as a component of program evaluation. This study attempted to address this research need by examining workforce needs assessment activity included in the evaluation efforts of a large-scale, nationally-funded CTE program.

Purpose of the Study

The purpose of this research study was to investigate the issue of workforce assessment as a component of the evaluation of CTE programs. The prime focus of this project was to examine a component of the NSF-funded ATE program by focusing on the extent, type, and outcomes of workforce assessment activities. The study used existing data from the annual survey conducted by the Western Michigan University Evaluation Center to evaluate outcomes of ATE-funded projects in 2008. The lack of research examining how CTE programs include workforce assessment as a component of evaluation is problematic, especially for programs such as ATE that are designed to foster strong connections between educators and employers in specific high demand occupations. Given the lack of existing research in this area, this study was a preliminary step towards examining the extent, methods, and outcomes of workforce needs assessment as an element of a broader CTE program evaluation initiative.

Research Questions

Given the lack of research on the extent of workforce needs assessment in CTE, this project was descriptive in nature. Three overarching research questions guided this study:

1. What percentage of ATE projects used workforce needs assessment in their evaluations?
2. What methods of workforce needs assessment were used most frequently?
3. What were the sources of workforce needs assessment data used most frequently?

Methods

This section presents information on the overall research design of the larger study from which the data were drawn as well as procedures for analysis.

Research Design

The study utilized a descriptive survey design within a mixed method evaluation approach (Creswell & Plano Clark, 2007). Using elements of mixed methods evaluation, as advocated by Greene and Caracelli (1997), the overarching purpose for this study was imbedded in a larger effort to evaluate the ATE pgrouponrogram annually. The yearly evaluation of ATE is conducted at the level of each funded project with the aim of providing consistent, ongoing collection and analysis of information for use in multiple decision-making contexts. As such, this evaluation is not a stand-alone activity but rather integrated into the cycle of project proposal solicitation, funding decision, implementation, and improvement. The ultimate goal of the larger evaluation process is to provide each ATE project provider and the funder with timely information to guide management and service delivery decisions. This approach takes into consideration contexts, implementation, and outcomes as suggested by El Ansari, Phillips, and Hammick (2001).

According to the NSF, project-level evaluation should emphasize connections to ATE outcomes and the provision of useful information to the projects and other stakeholders through the communication of results (Gullickson et al., 2006). The primary method for ATE program evaluation is an annual survey questionnaire sent to all principal investigators who were responsible for active projects or who were given continuation grants. The ATE program focuses on two major types of grant proposals offering funding for both projects and centers. A project is usually smaller in size and of shorter duration than centers.

The fields of technology supported by the ATE program include, but are not limited to, agricultural technology, biotechnology, chemical technology, civil and construction technology, computer and information technology, cyber security and forensics, electronics, energy, environmental technology, geospatial technology, manufacturing and engineering technology, marine technology, multimedia technology, nanotechnology, telecommunications, and transportation technology. All projects must be guided by a coherent vision of technological education and a vision that recognizes students as lifelong learners while also embracing the needs of the modern workplace (National Science Foundation, 2010). Projects have a degree of latitude regarding their focus, but the NSF encourages the following types of activities that (not listed in order of priority):

- link educators and educational programs in two- and four-year institutions and secondary schools, and connect them to business, industry, and government;

- develop programs with a focus on technological education for prospective K-12 teachers that link two-year and four-year college programs;
- develop programs to provide undergraduate research experiences for community college students;
- develop career pathways for technicians from secondary to two-year college programs and from two-year to four-year institutions;
- provide internships and field experiences for students, and provide prospective technicians with insight into real-world work environments including 21st century skills;
- serve the needs of both first-time students and returning students and workers wishing to acquire new skills, National Science Foundation (2010a).

Sources of Data

As stated previously, all ATE-funded activity for 2008 was included in the evaluation study conducted by Western Michigan University Evaluation Center. This represented a population of 164 funded ATE centers and projects. In 2008, completed and useable evaluation data were received from 162 (99%) centers and projects located throughout the United States. For the current study, the researchers were provided the raw data set (stripped of all personal identifying information) from the 2008 respondents for 130 projects and 32 centers. The focus of this study was on workforce needs assessment of individual ATE projects; hence, the data on centers were excluded. The study was limited to ATE projects with a strong connection to occupations in business and industry. Therefore, the range of ATE projects was limited further by excluding those that did not provide training and education with a perceived direct relevance to technology occupations and careers. Accordingly, 27 projects were removed from consideration including nine that focused on professional development, because this category provides funding for faculty development primarily. Also excluded were six projects listed as addressing core science instruction (the teaching of mathematics, physics, biology, etc.), because these did not relate immediately to specific occupations or jobs but rather sought to build foundational knowledge for future CTE training. Additionally, ten projects funding student recruitment and retention initiatives and those focused on the development of articulation agreements were removed along with two targeted research projects that did not relate directly to CTE occupations and careers. Finally, one additional project was removed due to a large amount of missing data. This resulted in 27 of the 130 projects being removed for a final 103 ATE projects with a strong link to CTE considered for analysis.

Instrumentation

The instrument used for the original data collection was a survey questionnaire that has been in use since 2000, with minor adjustments during the past nine years of annual administration as needed to enhance usability. The survey questionnaire was divided into six sections. The first three sections consisted of basic demographic items for grantees, organizational practices, and collaborative activities. The remaining three sections focused on materials development, professional development, and program improvement respectively. For this study, attention was directed to section 2 (primarily examining organizational practices - workforce needs assessment) as well as sections 1 (demographic data) and 6 (collaborative

activities). The survey instrument, along with the ATE fact sheet for the 2008 administration, may be found on the website: www.wmich.edu/evalctr/ate/publications.

Data Analysis

Data were analyzed using descriptive statistics (frequency and percentage) to determine the extent and methods of workforce needs assessment activities in ATE projects. More specifically, the extent of workforce needs assessment for ATE projects were analyzed, including the sources and methods each project used.

Results

Of the 103 ATE projects included in this study, almost two-thirds ($n = 74$, 71.8%) were in a 2-year community or technical college or 2-year college system. A total of 17 projects (16.5%) were located in 4-year colleges, with the remaining 12 (12%) distributed across professional associations and societies, nonprofit organizations, and K-12 school districts.

The first question on the section of the survey related to organizational practices asked respondents to indicate if their project had gathered workforce needs assessment data during the past year. Of the 103 ATE projects, one-half ($n = 52$, 50.5%) reported conducting a workforce needs assessment in the previous year. Figure 1 presents the results for the frequency and percentage use of each workforce needs assessment method used by the 103 projects.
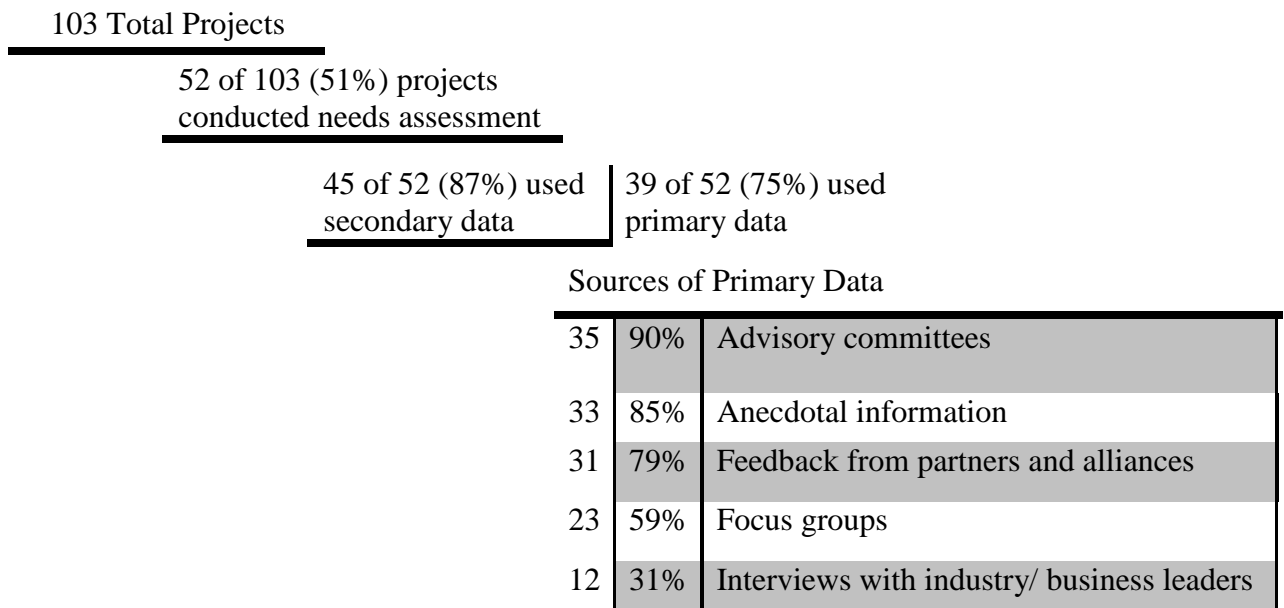
103 Total Projects

52 of 103 (51%) projects
conducted needs assessment

45 of 52 (87%) used | 39 of 52 (75%) used
secondary data | primary data

Sources of Primary Data

35	90%	Advisory committees
33	85%	Anecdotal information
31	79%	Feedback from partners and alliances
23	59%	Focus groups
12	31%	Interviews with industry/ business leaders

Figure 1. Sources of data for ATE projects conducting workforce needs assessment.

Subsequent analysis focused on the 52 projects that gathered workforce needs assessment with an examination of the methods and sources of data used for providing information. Respondents could indicate that they relied on multiple methods and sources to collect workforce needs assessment data. A range of well-known methods for workforce needs assessment (Ritchie, Gullickson, & Coryn, 2006), using primary and secondary data sources, were provided

with instructions for each ATE project survey responder to indicate which had been used during the last year. The method reported most frequently for workforce assessment was use of secondary data in the form of reports and studies written by others including state agencies and specific industry groups ($n = 45$, 87%).

Differences in the sources of these documents and reports were also examined, e.g., whether they were written by local, regional, or national agencies and organizations. The findings showed equal patterns of use with 35 of the 52 projects reporting using local reports, 35 using regional, and 35 using national. Not all 35 respondents for local reported utilizing regionally or nationally authored reports. The method used second most frequently was collecting primary data from business and industry as well as other constituent groups. A total of 39 (75%) project respondents indicated that they engaged directly in data collection activities. The largest number of projects ($n = 28$, 72%) reported collecting data from a local source, with slightly fewer *($n = 23$, 59%)* using data that was focused regionally, followed by 18 (46%) relying on primary data for workforce assessment drawn nationally.

The next series of questions on the survey instrument focused on specific methods used for obtaining workforce needs assessment data. The instructions noted that these questions should be completed only by those respondents who engaged in their own efforts to collect primary data as opposed to relying on secondary sources ($n = 39$).

The workforce needs assessment technique used most frequently were advisory committees ($n = 35$, 90%). Interpretation of this finding must acknowledge that one of the NSF requirements for ATE project funding is the establishment of an advisory committee. However, projects can use these committees for a diverse range of purposes including feedback on issues ranging from curriculum design to identifying areas for staff development, with no specific requirement that advisory committees provide input on workforce needs assessment.

Differences in the composition of advisory committees used, especially for workforce needs assessment existed, with 24 of the 35 projects reporting that members were drawn primarily from local agencies and organizations, 11 using committee members from a wider regional geographic area, and 8 relying on individuals from across the nation. In response to the frequency with which these advisory committees met, the projects with a regional committee tended to meet most often compared with those that were more local or national in their focus and member composition. On average, regional advisory committees met for 3.2 meetings per year compared with 2.9 for local and 1.8 for national projects. Few projects ($n = 5$) received a written report from their advisory committee, regardless of whether it was national, regional, or local. And, even fewer ATE projects ($n = 2$) reported making a written response to the report from their advisory committee.

The majority ($n = 33$, 85%) of the 39 ATE projects that collected workforce needs assessment information from business and industry and other constituent groups reported they gathered anecdotal information through conversations with business and industry representatives. The largest number ($n = 23$) of these said they relied on local sources with fewer (n = 15) relying on regional or national ($n = 14$) sources. A more formal and structured method of obtaining feedback from partners and alliances was used by 31 of the 39 projects (79%). Again, a similar breakdown of local ($n = 19$, 61%), regional ($n = 12$, 39%), and national ($n = 10$, 32%) sources for gathering assessment data through partners and alliances was reported.

A focus group was used by 23 of the 39 (59%) ATE projects conducting workforce needs assessment. Slightly more than one-third ($n = 16$, 41%) of the projects reported collecting their

own workforce assessment data by using a written or Web-based questionnaire. The largest number of these 16 projects ($n = 11$) were conducted on a local level, with only three collecting data at the regional level and two at the national level ($n = 2$). An interview method was used by 12 of the 39 projects (31%). Of these 12 projects, nine respondents reported conducting the interviews using their own staff, and three projects hired an outside individual or vendor organization to conduct the interviews. Only 10 projects reported they gathered feedback directly from organizations that employed their students and graduates; with eight of these projects reported that method was very useful.

Discussion and Implications

For a large scale, federally funded CTE related program with specific goals to connect education and employers, it was surprising that only one half of the reporting ATE projects used workforce needs assessment. Despite strong language encouraging workforce assessment in the program solicitation (National Science Foundation, 2010a), a wealth of previous evaluation data (Gullickson et al., 2006), and a research brief on the importance of gathering these data (Ritchie, at al., 2006), it appears that barriers exist that limit or prevent this activity. Perhaps, additional confirmation on the extent and benefits of workforce needs assessment in corporate settings as well as reports of the extent of these activities in other occupational areas would be beneficial. For example, research has also shown that the more information collected and considered in decision making, the greater the levels of organizational effectiveness (Falshaw, Glaister, & Ekrem, 2006; Grinyer & Norburn, 1975).

For the ATE projects engaged in workforce assessment activities, a slight preference for using secondary data in the form of reports and studies written by others emerged, including state agencies and specific industry groups, as opposed to collecting primary data. This conflicts with research findings from private industry that has shown top level managers prefer personal sources over impersonal sources such as government reports, newspapers, and published research findings (Jennings & Jones, 1999; Keegan, 1974). The most frequently reported method for primary data collection for workforce assessment was advisory committees. The NSF has long favored advisory committees for key roles related to providing up-to-date information on the state of the field, oversight on program management and performance, and advice to project directors on special issues (National Science Foundation, 2010b). The findings of this study showed that advisory committees for ATE projects were regarded as performing an important role in workforce needs assessment.

The second most favored approach to workforce needs assessment was collecting anecdotal information through conversations with business and industry representatives as well as relying on more formal and structured methods of obtaining feedback from partners and alliances. A degree of overlap between these two approaches is likely, given that informal and formal collaborations to foster the sharing of mutually beneficial workforce data became a popular phenomenon in business, government, and communities during the 1980s (Gray, 1985). Barney and Hesterley (1996) suggested that organizations enter into strategic alliances with education institutions primarily for sharing risk and managing strategic uncertainties. They noted further that such motives are a common basis for community colleges' collaborations with business and industry and other education entities to forecast workforce development needs, develop new training opportunities, and identify new student markets.

The use of focus groups as a popular method for workforce needs assessment may reflect the acceptance of this approach for gathering data to inform decision making across a wide range of applications (Krueger, 1994). Focus groups for workforce assessment enable broad level input and promote buy-in from diverse stakeholders, offer moderate validity, allow specific and probing focus on competencies needed in the future, and are relatively inexpensive for the large amount of data that can be collected (Marrelli, 1998). The finding from this study highlighting the frequency of focus group use recognizes how this method can be an important tool in qualitative evaluation research including post-program evaluation as well as needs assessment and strategic planning (Krueger, 1994).

The finding that local data for workforce needs assessment was relied on more frequently than regional or national sources may reflect the close connections between the institutions offering ATE programs and their local labor market (Lawrenz et al., 2003). But given the increasingly mobile nature of workers and the shifting centers of employment for high demand technology jobs, perhaps, it would be advisable to encourage equal use of regional and national sources of workforce needs assessment data. Regarding decision making on the type and source for workforce needs assessment, it may be that a diverse approach to methods would yield more appropriate results. A combination of methods could provide a balance to the strengths and weaknesses of each method.

Conclusions and Recommendations

Based on the finding of this study, it appears that workforce needs assessment as a component of the evaluation of the ATE program is falling short of its potential. Previous work on the ATE program noted that the NSF expects project personnel to evaluate their work and outcomes. But the NSF and other federal agencies do not metaevaluate routinely to determine the usefulness of project-level evaluations with an aim to improve their quality (Gullickson & Hanssen, 2006). The failure to utilize fully workforce needs assessment as a component of evaluation would appear particularly acute for the ATE program, given the massive investment in this program and its expressed aim to address potential workforce shortages in occupations considered vital to the future U.S. economy. Much of the literature on workforce needs assessment lies outside of publication sources related to education and more specifically in CTE (Jennings & Jones, 1999; Rothwell & Kazanas, 1994). Yet, the need to align education programs with desired workplace outcomes is an increasing visible trend in CTE (Rojewski, 2002). This highlights a clear opportunity for CTE researchers and practitioners to learn from other disciplines including management, human resource management, and human resource development regarding workforce assessment and evaluation practices.

It has been noted that a needs assessment process using accurate data and providing for negation among differing points of view can engage and mobilize decision makers and others who have a stake in the issue (Gupta et al., 2007). This clearly would seem to reflect the current situation confronting CTE and the need to improve the education for technicians in advanced technology fields. In light of constrained training and development budgets in many organizations, employers look increasingly toward education programs to provide them with workers possessing the skills and knowledge needed to compete in the future. Consequently, it is likely that workforce education will embrace increasingly a collaborative model between employers and education providers. HRD professionals could be well-situated to act as a conduit between the two groups allowing for an efficient and effective bridge between the provision and

delivery of education and the workplace performance needs of employers. The potential connections and need for more integration between CTE and HRD have long been advocated (Gray, 1997; Kuchinke, 2002). The incorporation of workforce needs assessment as a component of program evaluation may expand the cadre of proponents beyond educators and policymakers to include employers who are able to advocate for continued investment in CTE programs.

Recommendations

Finally, much future research is needed to explore further the attitudes toward needs assessment, the relative advantages of each individual method as well as combinations of various methods, and, ultimately, the outcomes associated with assisting organizations in the strategic management and development of their human resources. This study was somewhat limited by the data to a descriptive methodology. However, examination of the relationship between those ATE projects using workforce assessment and various measures related to student learning, performance, and employability are needed. Further comparison studies of those projects not using workforce assessment and those that do would shed light on any observed differences of program administration and evaluation. In addition, more longitudinal research approaches to examine the outcomes accrued to employers providing workforce assessment data would enhance the existing literature. Because of the increasing desire of employers to participate in the education process of their future workforce, CTE is well-situated to provide leadership on workforce needs assessment research.

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