



EDUCATION AND EMPLOYMENT RESEARCH CENTER

# Technician Program Connections to Economic Development: Findings From a Survey of Advanced Technological Education (ATE) Grantees

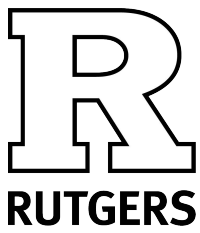
Anjali Srivastava and Michelle Van Noy

JULY 2024



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## About the Authors

**Anjali Srivastava** is a researcher with the Education and Employment Research Center at the Rutgers School of Management and Labor Relations.

**Michelle Van Noy** is the director of the Education and Employment Research Center at the Rutgers School of Management and Labor Relations.

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# Introduction

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Increased federal investment in the domestic infrastructure of STEM fields has brought with it the need for a more thorough understanding of how investments in technician education contribute to economic development. Over the past 30 years, the National Science Foundation’s Advanced Technological Education (ATE) program has led the charge to support innovation in technician education through its partnerships with community colleges. ATE’s technician education programs support economic development by addressing community and regional economic needs and by adding skilled technicians to the workforce who contribute to workplace innovations. It has not been clear up to this time, however, how or whether ATE grantees perceive economic development to factor into their project goals.

Researchers at the Hidden Innovation Infrastructure (HII) project at Rutgers’ Education and Employment Research Center (EERC) are working toward defining the role of technician education in economic development. We surveyed principal investigators (PIs) of ATE-funded projects to learn whether they have stated goals and outcomes related to economic development, how they think about economic development, and whether they engage in activities related to economic development.

In a recent report, EERC researchers proposed a conceptual model of the role of community colleges in economic development (Van Noy et al., 2023). The model illustrates the ways in which community colleges engage in the following activities related to economic development: education and training, business outreach, and regional outreach. Similarly, ATE PIs, along with other staff or individuals in their organizations and institutions, may partner with educational, business and industry, economic and community, or other organizations in work that advances economic development.

We analyze survey data to explore how PIs view economic development relative to workforce development and whether and how they vary in their understanding of how their grant-funded projects may relate to economic development. Our goal is to advance understanding of the ATE program’s contribution to economic development by examining how ATE PIs define economic development, and some of the ways ATE grantees and their institutions engage in economic development–related activities

# Methodology

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This brief examines data from the 2023 national EvaluATE survey of ATE-funded PIs, which has been conducted annually by the Evaluation Center at Western Michigan University since 1999. We focus primarily on data drawn from a supplement to the survey designed by the HII project, which asked questions about economic development as well as activities during the 2022 calendar year.<sup>1</sup> The Evaluation Center sent links to the 2023 survey to the PIs listed on all active ATE-supported projects with a funding start date on or before December 31, 2022 (N = 361). The Evaluation Center supplied us with completed survey data from 338 PIs, reflecting a completion rate of 94 percent.<sup>2</sup>

The survey presented PIs with the following conceptualization of the role of technician education in economic development (“HII project definition”):

*Community college technician education contributes to economic development when there is an intentional link between program activities and community and regional economic needs. This happens through partnerships with organizations in the community and activities that are connected to economic development goals designed to promote economic growth and prosperity regionally and nationally.*

PIs were then asked questions based on the working definition. They were asked whether their project includes stated goals or outcomes related to economic development as it is outlined in the working definition and what they are. PIs were also asked if they have a way of thinking about economic development that is different from the HII project definition; whether they view economic development as different from, the same as, or as an approach to workforce development; about community and regional partners; and whether they participate in specific activities that may be related to economic development.

We reviewed and coded the survey data, then used the codes to summarize and analyze the most prevalent themes to emerge across grantees’ responses to our survey supplement questions.

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<sup>1</sup> The survey was conducted online, but a preview of the questions contained in the survey can be viewed in pdf format on the EvaluATE website at <https://atesurvey.evaluated-ate.org/wp-content/uploads/documents/2023-ATE-Survey-Preview.pdf>. This preview does not include questions from the HII supplement.

<sup>2</sup> Percent figures in this brief are relative to all 338 PIs who responded to the survey unless otherwise stated.

# Findings

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Key themes emerged from the data regarding the relationship between community college technician education and economic development. First, we discuss our findings on grantees' statements about their project goals or outcomes as related to economic development as well as their descriptions of their ways of thinking about economic development. Second, we discuss the various activities that grantees and their college engaged in that pertain to economic development.

## *Economic Development Goals*

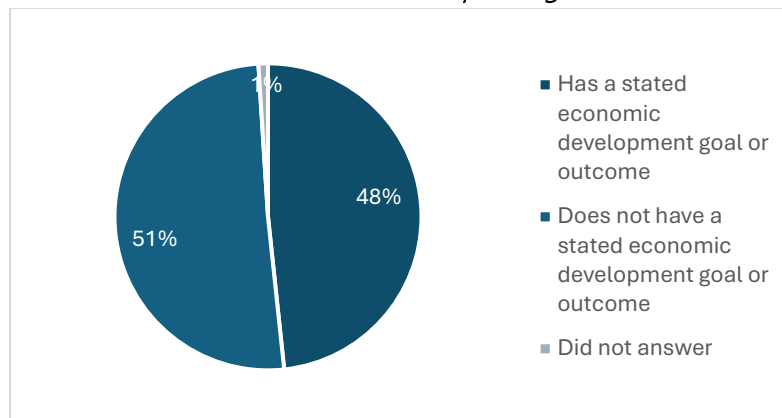
### *Understandings of Economic Development*

All 163 respondents who said that their project had a stated goal or outcome related to the HII project definition had an opportunity in the survey to describe their goals or outcomes. Most of those respondents (94%) provided additional substantive description of their goals or outcomes. We examine their responses in this section to provide a more nuanced picture of how ATE grantees view their role in economic development.

***Some PIs reported having an economic development goal or outcome, but others did not.*** To understand ATE grantees' work within the context of economic development, it is important to examine how PIs define the concept of economic development and to determine whether that factors into their program design and/or outcomes and goals. We examined this by first asking PIs if their project had a stated goal or outcome that met the HII project definition. (See Methodology section for the complete definition.)

About half (48%) of respondents reported having stated goals or outcomes related to economic development based on this definition.

*Figure 1. About half of ATE PIs reported that, based on the HII project's working definition, their project included a stated economic development goal or outcome.*



**Whether ATE PIs reported having a stated economic development goal or outcome varied by their disciplinary areas of focus.** The proportion of PIs who reported having a stated economic development goal or outcome based on the HII project definition ranged between 37 percent and 60 percent across six broad primary areas of focus. Projects in the manufacturing and bio and chemical sciences fields were the most likely to have a stated economic development goal (60% and 55%, respectively). See Table 1.

*Table 1: ATE Projects with a Stated Economic Development-Related Goal or Outcome by Disciplinary Focus*

Primary Field of Focus	Total Number Projects Within a Field	Percentage of Projects Within Field with Stated Economic Development Goals or Outcomes
Manufacturing	85	60%
Bio and Chemical Technologies	40	55%
Agricultural and Environmental Technologies	29	48%
Engineering Technologies	45	47%
Information and Securities Technologies	68	43%
General or Interdisciplinary/Cross-Cutting Advanced Technological Education	71	37%
Total all Survey Respondents	338	48%

**ATE PIs based at community colleges and nonprofits were more likely than those based at four-year colleges and universities to report that their projects had a stated economic development goal or outcome.** Most PIs (260) were located at two-year colleges/college systems, although small numbers were at other types of institutions including 18 PIs at nonprofit organizations and 47 at four-year colleges or universities. About half (51%) of PIs located at two-year colleges/college systems and half (50%) of those located at nonprofit organizations said that their projects had stated goals and/or outcomes related to the HII project’s working definition of economic development. A lower percentage (40%) of PIs located at four-year colleges or universities did so.

**Of those PIs who reported an economic development-related goal, most described activities focused on education and training.** Some respondents—44 percent of PIs providing descriptions of stated goals or outcomes and 20 percent of all PIs responding to the survey—noted that their goal focused on their approach to education and training activities in their local context. For example, one respondent stated: *“The curriculum and training program initiatives are directly informed by the needs of industry.”* Similarly, another respondent said the goal of their project was *“to develop an additive manufacturing technician degree to support local employers/businesses that are using the technology for product design/development.”* Highlighting a particular approach to education and training, another respondent described the following project goal: *“To improve student standing on the job market by developing entrepreneurial skills through project-based design thinking.”*



***PIs in this group sometimes set goals for their projects that included building a skilled workforce and addressing local or regional labor shortages.*** Forty-one percent of PIs providing descriptions, or 19 percent of all PIs responding to the survey, noted that their project had a goal or outcome related to building a skilled workforce. Desired outcomes to increase or build skilled workforces were a common theme. For example, one respondent stated their goal was to *“Develop a workforce pathway that does not exist or exists with very narrow bandwidth to meet industry need, thus creating an economic impact [by way of] a new skill set and training program.”* Another respondent noted, *“Local industry suffers from an acute shortage of trained technicians, and this is impacting plans for further expansion and growth of these companies. The goal of this project is to help close this regional ‘skills gap.’”*

***Some PIs who understood their projects to be related to economic development based on the HII project definition described having goals focused on inclusivity.*** These PIs discussed inclusiveness generally; specific goals related to diversity; poverty and socioeconomic status; pipelines for recruiting students and workers; outreach to rural populations; and other areas of focus. For example, one respondent stated their project was aimed at *“creating job opportunities for underrepresented minorities in an emerging STEM field which will lead to the upward social mobility of the local community.”* Another respondent expressed a goal *“to engage more female and minority students in the field of cybersecurity in the rural communities.”*

***Although some PIs had ways of thinking about economic development that were different from the HII project definition, they provided descriptions that were often closely aligned with that definition.*** Nearly one-third (27%) of all respondents said they defined their project’s role in economic development in a way that was different from the project definition. Interestingly, however, PIs providing alternate definitions covered several similar themes, such as focusing on education and training activities (29% of those with alternate definitions), building the skilled workforce (48% of those with alternate definitions) and creating a pipeline for workers by recruiting and retaining students (10% of those with alternate definitions). One PI noted: *“economic development relies on an educated workforce. It is our goal, as a college, to help provide that workforce.”*

***PIs’ descriptions of how their projects pursued the goal of workforce development provide further nuance for their definitions of economic development.*** One PI described the relationship between workforce development and economic development this way: *“I think workforce development drives economic development. A capable workforce will ultimately lead to increased customer satisfaction/retention, which should lead to economic growth and stability.”* Another PI described the relationship as follows:

*We have focused on workforce development, which works in conjunction with economic development. The economic development of a region depends on the availability of industry and on the availability of skilled workers to meet the needs of industry.*

Finally, another respondent noted the role of the workforce in economic development:

*The project will have an impact on the future of economic development by providing students that are job ready and have the required skills needed by industry. These students will help in narrowing the skills gap seen in today's workforce and promote the development of skills in emerging technology.*

In expanding upon their definitions of economic development as something other than the HII project definition, some PIs discussed creating partnerships or working with partners. With another area of focus, some PIs discussed their role in expanding economic opportunity to serve their community. One PI stated that *“strong CTE education programs at the community college help regional economic development boards attract and retain new industries.”* Similarly, another PI noted: *“Economic development brings new businesses to an area rather than helping create avenues for people to prepare for employment.”*

***Some PIs discussed having project goals focused on inclusivity, including PIs who felt their project goals/outcomes aligned with the HII projects working definition of economic development and PIs who did not.*** One stated: *“Building workforce programs for historically excluded groups to access local jobs with career mobility at family-sustaining wages is an economic development strategy.”* Some discussed inclusiveness generally, while others referenced specific types of inclusivity. Those more specific themes were related to increasing diversity (2%), eliminating poverty and improving socioeconomic status (3%), addressing concerns of rural populations and areas (1%), or inclusivity in building a pipeline of workers (3%).

### ***Perspectives on Workforce and Economic Development***

Views on the relationship between economic development and workforce development can vary. Conceptually PIs might view economic development as an approach to workforce development, as conceptually different, or as essentially the same thing. We examined these different possibilities to better understand PIs conceptions of economic development as it related to workforce development.

More PIs saw economic development as a particular approach to workforce development than viewed the concepts as wholly the same or thought about the concepts as fully distinct. Many respondents (42%) viewed economic development as a particular approach to workforce development.<sup>3</sup> A smaller group (28%) viewed economic development and workforce development as different, and nearly one-quarter (24%) viewed the two as synonymous. One respondent described the relationship this way: *“Our project is focused on increasing the functionality of education/industry partnerships. We believe workforce education is a subset of workforce development, and that workforce development is a subset of a region's greater economic development.”* Another described the role that workforce development plays in economic development:

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<sup>3</sup> The survey asked respondents whether they viewed economic development as a particular approach to workforce development. Some respondents indicated that they would reverse the order of these concepts and viewed workforce development as an approach to economic development.

*"I think workforce development drives economic development. A capable workforce will ultimately lead to increased customer satisfaction/retention, which should lead to economic growth and stability."*

***Some PIs who saw workforce development and economic development as two separate concepts described them as working in tandem with one another.*** As an example of this perspective, one respondent stated:

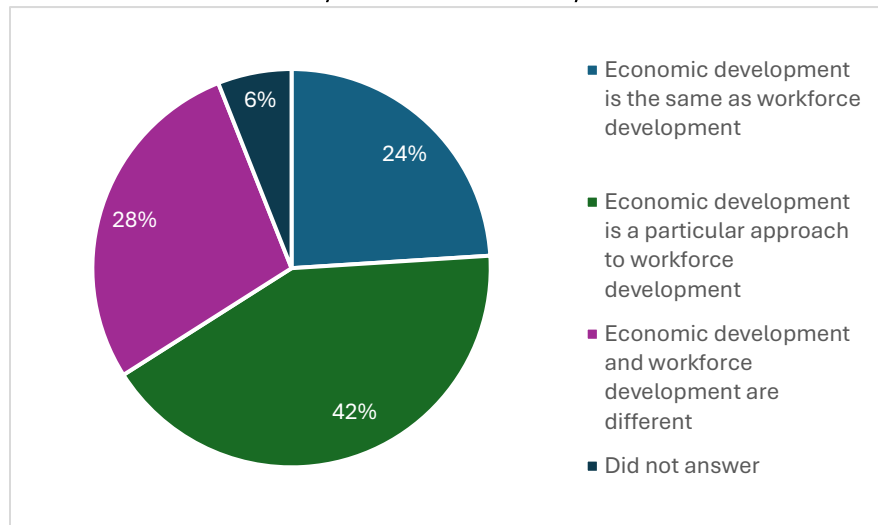
*We have focused on workforce development, which works in conjunction with economic development. The economic development of a region depends on the availability of industry and on the availability of skilled workers to meet the needs of industry. Having employees that are making a livable wage also contributes to the economic development of the immediate area. In that sense, they rely on each other.*

In a similar way, another respondent described how workforce development is a separate but related activity to economic development.

*Our center is connected to industry as well as economic development groups locally. All of these work synergistically to help build necessary workforce because without workforce, our industry cannot grow, and new companies cannot develop and contribute. Industry, education/workforce development, and economic development are all different, but they do require each other to ultimately be successful for all.*

***About a quarter of the PIs surveyed conceptualized workforce development as equivalent to economic development.*** For example, one stated: "Economic development relies on an educated workforce. It is our goal, as a college, to help provide that workforce." Another explicitly stated the importance of the workforce: "Our focus is to strengthen the rural economy by providing skills and education necessary for needed improvement in water and soil conservation." Another respondent pointed to the importance of building a pipeline of students: "Stimulate interest and growth in high school students choosing mechatronics as a potential career."

Figure 2. PI views on the relationship of economic development and workforce development



**Underlying these differences in views were PIs' reporting of education and training and business support activities as parts of their economic development efforts.** PIs who saw economic development and workforce development as the same were more likely to mention education and training in descriptions of their projects' economic development–related stated goals and objectives than were PIs who viewed those concepts as different in some way. Nearly four in ten (39%) of the PIs who saw economic development and workforce development as the same mentioned education and training in descriptions of their projects' economic development–related stated goals and objectives. In contrast, education and training goals were mentioned by only about one-quarter of the PIs who saw economic development as a particular approach to (24%) or wholly different from (23%) economic development.

**As a group, those who saw economic development as different from workforce development also varied by some thematic patterns across their goal descriptions as compared to PIs who saw more similarity or connection between the concepts.** Only 9% of those who viewed economic development as different from workforce development noted an economic development–related goal or concept that involved creating a pipeline for workers to recruit students versus 17% of those who saw workforce development and economic development as nested and 23% of those who saw those concepts as being the same. In contrast, this group was more likely to mention activities in support of businesses: 13% of those who viewed economic development as different from workforce development mentioned economic development–related goals involving recruiting new companies to the area or expanding businesses versus 6% of those who saw workforce development and economic development as nested and 4% of those who saw them as being the same.

### ***Economic Development Activities***

In this section, we examine the range of economic development–related activities of ATE-funded projects as well as those of the institutions and organizations that house them. We asked PIs to report whether their projects engaged in specific activities and whether their institutions engaged in those same activities apart

from their projects. These results are displayed in Table 2. Across all categories—education and training, business outreach, and regional outreach—PIs were more likely to report that their host institutions were engaged in activities related to economic development than to report that their projects were directly engaged in those activities.<sup>4</sup> Understanding what kinds of economic development–related activities are taking place at ATE-project host institutions outside the project context could present opportunities for PIs to bolster their engagement with those efforts.

***ATE PIs reported engaging in education and training activities related to economic development at relatively high rates.***

Nearly two-thirds of all PIs responding to the survey (62%) reported that their projects offered industry-aligned courses and credentials in in-demand fields, and nearly as many (60%) said they hosted regular industry advisory or industry partner meetings to inform college offerings related to economic development. Institutional involvement in these activities was also high: Over three-quarters (82%) of PIs reported that their institutions offered industry-aligned courses and credentials in in-demand fields, and 71 percent said their institutions hosted regular industry advisory or industry partner meetings to inform college offerings.

***PIs reported low rates of involvement in business outreach activities related to economic development within their project context but higher rates of business outreach by their host institutions.***

Although only 15 percent of PIs reported conducting research and development in partnership with universities, that was the most common form of economic development–related business outreach engaged in by ATE projects. PIs reported much higher rates of engagement with business outreach activities among their host institutions: Nearly half (47%) of ATE host institutions provided facilities for use by local employers; 39 percent offered small business assistance; 39 percent conducted research and development in partnership with universities; and 32 percent offered small business incubation or commercialization.

***More PIs reported ATE projects taking part in some type of regional outreach than in any one activity directly related to outreach to businesses.***

One-third (33%) of ATE projects convened regional stakeholders around industry needs. PIs reported engaging in other activities less frequently, including assisting in efforts to attract employers to the region or to expand existing employers (15%), conducting economic scans (7%), and participating in regional economic planning or policymaking (7%). PIs were far more likely to report that their host institutions were engaged in regional outreach than they were to report that their ATE project engaged in those activities directly: Over half (52%) of ATE-project host institutions convened regional stakeholders around industry needs; nearly half (48%) participated in regional economic planning or policymaking; 44 percent assisted in efforts to attract employers to the region or to expand existing employers; and 39 percent conducted economic scans. Engagement with regional outreach may be more inclined to occur in that broader context, however, given that engagement in many regional economic initiatives is led at the institutional level within community colleges. It may therefore be difficult for ATE grantees to singularly engage in these efforts. Further, not all ATE grantees have goals that immediately connect to economic development.

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<sup>4</sup> Some PIs were uncertain of their institution’s activities, so it is possible that more activities occurred at the institutional level than were reported.

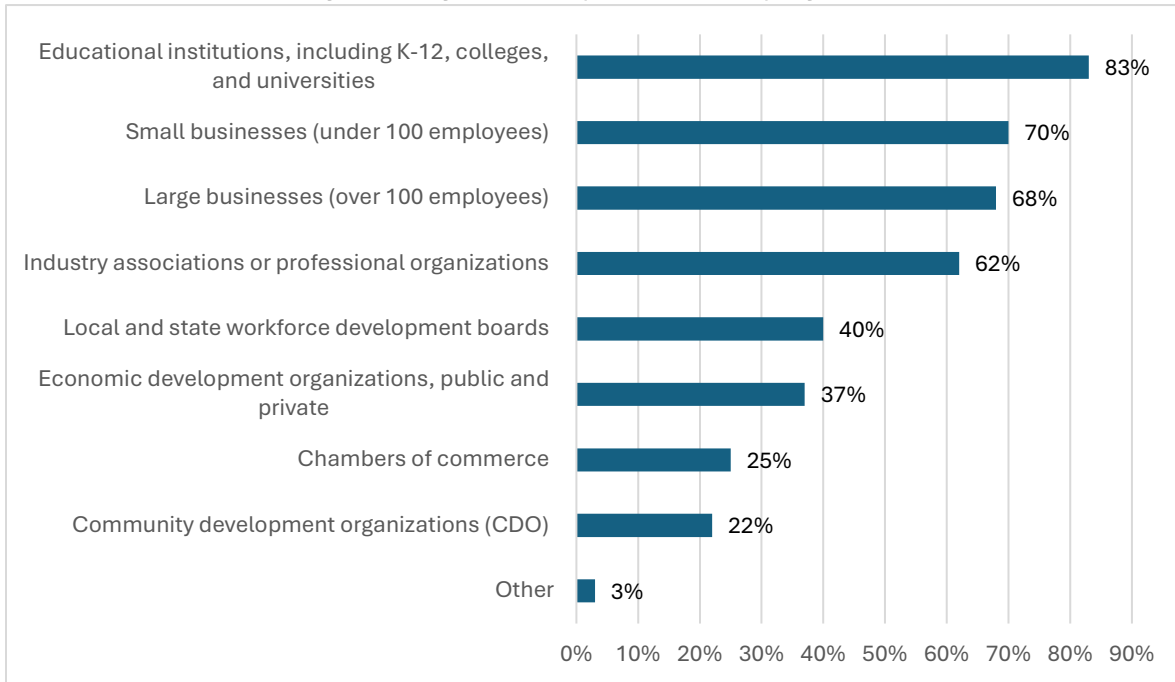
*Table 2: ATE-Project and Institutional Participation in Activities Related to Economic Development*

	Engagement Rates for ATE projects	Engagement Rates for ATE Grantees' Institutions Apart from their ATE Projects
	%	%
<b>Education and training</b>		
Offer industry-aligned courses and credentials in in-demand fields	62	82
Host regular industry advisory partner meetings to inform college offerings	60	78
Offer "learn and earn" or formal work-based learning opportunities	25	54
Offer customized training for local and regional employers	22	71
Offer entrepreneurship training	7	55
Other ways of engaging in education and training	12	17
<b>Business outreach</b>		
Conduct research and development in partnership with universities	15	39
Provide facilities for use by local employers	8	47
Offer small business assistance	3	39
Offer small business incubation or commercialization	1	32
Other ways of engaging in business outreach	6	10
<b>Regional outreach</b>		
Convene regional stakeholders around industry needs	33	52
Assist in efforts to attract employers to the region or expand existing employers	15	44
Conduct economic scans	7	39
Participate in regional economic planning or policymaking	7	47
Other ways of engaging in regional outreach	4	7

***The most common partners for ATE projects were other educational institutions, followed by businesses and industry associations.***

Understanding the types of organizations that ATE projects work with can provide context for their participation in economic development activities. PIs identified types of organizations their projects partnered with regardless of whether those activities were directly related to economic development. Well over three-quarters (83%) reported working with educational organizations, the most commonly cited organizational partner. Business and professional partnerships followed, with 70 percent of PIs reporting having engaged with small businesses, 68 percent with large businesses, and 62 percent with industry or professional associations. PIs reported working with other types of organizations less frequently, including local and state workforce development boards (40%), economic development organizations (37%), chambers of commerce (25%), and community development organizations (22%).

Figure 3. Organizational partners of ATE programs



# Conclusion

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Currently there is a wide degree of variation in ATE grantees' understandings of how their projects contribute to economic development. Grantees expressed a range of understandings of economic development and ways of engaging in it. They also expressed a variety of goals relative to economic development. PIs described their economic development–related goals, outcomes, and ways of thinking with some prevalent themes concentrated on education and training, outcomes related to building a skilled workforce, and objectives related to increasing diversity and addressing socioeconomic inequality. Economic development–related activities occurred within areas of education and training, business outreach, and regional outreach. The research presented here provides a glimpse of these activities and illuminates the need to better understand how the ATE program and its grantees are engaged in economic development and to what extent that engagement is intentional. Further conversations within the ATE community may help to advance this understanding and provide more insight into the ways community college technician education programs are engaging in economic development activities. Ongoing research, including the HII project's in-depth case studies of community college technician education programs across the United States, will provide additional insight and increase awareness of the important role of technician education—including the projects funded by ATE—in our nation's economic development.



# References

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## The Education and Employment Research Center

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Non-Degree Credentials



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## Rutgers School of Management and Labor Relations

Rutgers' School of Management and Labor Relations (SMLR) is the leading source of expertise on the world of work, building effective and sustainable organizations, and the changing employment relationship. The school is comprised of two departments—one focused on all aspects of strategic human resource management and the other dedicated to the social science specialties related to labor studies and employment relations. In addition, SMLR provides many continuing education and certificate programs taught by world-class researchers and expert practitioners. SMLR was originally established by an act of the New Jersey legislature in 1947 as the Institute of Management and Labor Relations. Like its counterparts created in other large industrial states at the same time, the Institute was chartered to promote new forms of labor-management cooperation following the industrial unrest that occurred at the end of World War II. It officially became a school at the flagship campus of the State University of New Jersey in New Brunswick/Piscataway in 1994. For more information, visit [smlr.rutgers.edu](http://smlr.rutgers.edu).

## National Science Foundation

The U.S. National Science Foundation (NSF) is an independent federal agency that supports fundamental research and education across all fields of science and engineering. In Fiscal Year 2022, its budget is \$8.8 billion. NSF funds research in all 50 states through grants to nearly 2,000 colleges, universities and other institutions. Each year, NSF receives more than 50,000 competitive proposals for funding and makes about 12,000 new funding awards.

With a focus on two-year Institutions of Higher Education (IHEs), the Advanced Technological Education (ATE) program supports the education of technicians for the high-technology fields that drive our nation's economy. The program involves partnerships between academic institutions (grades 7-12, IHEs), industry, and economic development agencies to promote improvement in the education of science and engineering technicians at the undergraduate and secondary institution school levels. The ATE program supports curriculum development; professional development of college faculty and secondary school teachers; career pathways; and other activities.

