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The Hidden Innovation Infrastructure: Understanding the Economic Development Role of Technician Education in the Changing Future of Work

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Rutgers, The State University of New Jersey

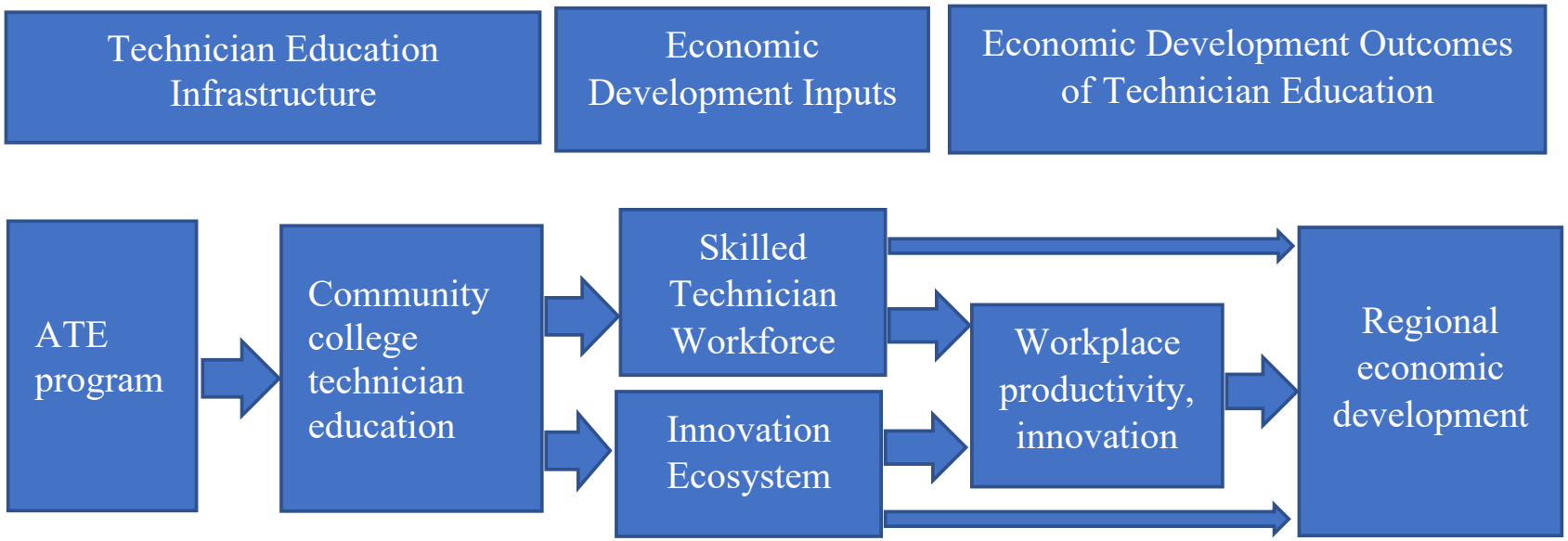
What is the Hidden Innovation Infrastructure?

- Technicians and the education programs that prepare them – often overlooked. Yet, they have a potentially important role in innovation.

- Technicians mediate technology and practice
  - More than operators
  - Offer input into manufacturing processes, product development, and best practices
  - Can generate new innovations based on insights from practice

- With changes in the workplace, e.g. automation, technician education is increasingly important
  - Increased need for higher skill levels among technicians
  - CC programs have long track record in technician education

The Role of Technician Education in Economic Development



Technician Education Infrastructure

National Science Foundation's Advanced Technological Education program

- Significant investment: Funded 1,446 projects and 64 centers, investing $1.24 billion, from 1993-2020.
- In 2019 ATE grantees have:
  - Educated 65,000 students
  - Engaged in 8,500 collaborations
  - Developed 7,110 curriculum materials
  - Offered 1,070 professional development opportunities

ATE Impacts Program Overview Brief, 2020

Technician Education Infrastructure

Community college technician programs

- Includes a range of sectors, including manufacturing; agricultural and environmental, bio- and chemical engineering; information technology; and nanotechnology.
- Offered in many forms:
  - Awarding of for-credit certificates, and degrees
  - Noncredit programs
  - Customized training
- Includes many aspects:
  - Close relationships with employers, labor market alignment
  - Pathways development to promote student advancement
  - Effective student recruitment, advisement, and support

Economic Development Inputs

Skills development ➔ Skilled technician workforce

- Fundamentally about student learning of skills and competencies

- Alignment with student needs, employer needs, and regional needs

- In 2019, a total of 357,104 students earned degrees or certificates of up to two years in length from 2381 institutions in 131 technician fields (IPEDS data).

Economic Development Inputs (cont.)

Support of the innovation ecosystem

- entrepreneurship training and small-business incubation and assistance
- participation in local economic planning and policymaking
- presentation of forums to promote business and education interaction
- provision of high-tech courses in line with local economic development efforts
- convening industry clusters
- technology transfer
- conducting economic scans
- assistance in attracting employers to the region
- opening up their facilities for use by local companies

Economic Development Outcomes of Technician Education

Workplace productivity and innovation

- higher levels of employment and earnings
- what occurs in the workplace – the actual practices that underlie the assumption that earnings reflect productivity
- mediating technology and practice, technicians are part of an often-unseen process of innovation
- application of technology in terms of the interaction between high-end research and development (R&D) and its practical execution

Economic Development Outcomes of Technician Education (cont.)

Regional economic development

- job creation as well as economic development via structural changes, both in terms of the mix of sectors and in terms of economic productivity
- adapt to economic changes
- link between education and social returns to communities
- regions may be defined as tied to local labor markets or conceptualized as broader economic development units tied to urban centers
- industry- or sector-specific approaches

Questions/Discussion

For More Information

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