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The Hidden Innovation Infrastructure: Lorain County Community College

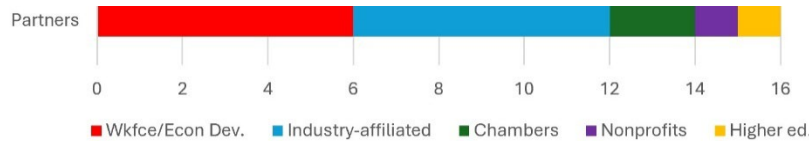
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Community colleges and their technician programs play an important and sometimes overlooked role in supporting regional economic development. In this five-year research study funded by the US National Science Foundation Advanced Technological Education (NSF ATE) program, Rutgers' Education and Employment Research Center (EERC) sought to examine how eight leading colleges engaged in economic development through innovations in their technician education programs and to better understand and highlight these models. In addition to the eight college case studies, the project included interviews of 23 NSF ATE awardees, a survey of technician employers, and related labor market research. This brief describes the approach of Lorain County Community College, one of eight community colleges to participate in this study.

PROGRAMS | The study focused on two of LCCC's technical education programs:
Program 1: Automated Engineering *Program 2: Microelectromechanical Manufacturing Systems (MEMS)*

PARTNERS | LCCC programs of focus benefit from partnerships with many regional employers and a diverse set of regional economic development organizations.

REGIONAL.ECONOMIC.DEVELOPMENT PARTNERS



This figure shows the breakdown of LCCC partners by organizational type. It offers a glimpse into the composition of actors in LCCC's regional economic development ecosystem.

Sixteen economic development partners were identified for the survey. One interview was conducted with Ohio TechNet.

EMPLOYER.PARTNERS

LCCC works closely with an impressive array of regional employers, especially those in the microelectronics industry, including employers in electronics and in prototyping/incubation.



Incubation/Prototyping



Electronics

EMPLOYER.PARTNERS.CONTINUED

The Microelectronic Manufacturing (MEMS) Lab at LCCC: Investing at the Industry Level

Through its MEMS lab and other early investments in microelectronics, LCCC has been able to strategically support a broader regional cluster around microelectronics in Ohio. LCCC's employer partners credited the college with directly contributing to company efficiencies, facilitating linkages among the regional industry, and playing a leadership role in upgrading the regional industry's technology, including specialized training equipment alongside dynamic curriculum.

One employer commented on LCCC's close, strategic relationship with its community of regional industry partners, explaining: "The LCCC instructor will send an email saying, "Based on conversations"—and he's got a mailing list of up to 50 people—I'm looking at adding this capability. I would appreciate your thoughts.' He's asking us, 'If I'm going to teach something, I want it to be widely used.'"

PROGRAM.HIGHLIGHTS;COMMUNITY.COLLEGE.COLLABORATION.™.DIRECT.ENGAGEMENT.OF.LOCAL.COMMUNITIES.

LCCC has translated its expertise around industry engagement and training for microelectronics-related manufacturing into collaborative leadership roles among Ohio's community colleges. In its own immediate community, LCCC has directly engaged local residents and leaders in collaborative, large-scale strategic-planning processes; the college also made special effort to go through locally embedded networks to recruit inclusively for its programs.

Leading Collaboration Among Ohio's Colleges. Intel selected LCCC to lead a grant-funded effort aimed at preparing for the company's move into Ohio. Lorain's grant funded the Ohio TechNet Northeast Ohio Semiconductor Workforce Consortium, facilitating collaboration among educational institutions to develop needed curriculum and faculty training materials, including those related to experiential learning. Ohio TechNet also supports its member colleges with resources and technical assistance, so they can sustain dynamic manufacturing programs that meet evolving state-wide industry needs.

Embedding in Local Community Networks. LCCC's approach to community engagement uniquely brings community members directly into the institution's planning processes. Similarly, LCCC went through established organizations and networks to recruit for its programs, especially for recruitment from underrepresented groups. Finally, LCCC worked with Ohio's economic development organization Team Neo to embed its inclusion goals directly into its program design through initiatives like Career by Design which educates students about expected wages in the local economy for particular credentials.

PROGRAM STRENGTHS | LCCC reflects some of the best practices for institutionalizing partnerships, responding to the local community, and coordinating industry needs at the regional level.



INSTITUTIONALIZED PARTNERSHIP

LCCC programs are embedded in an extensive partnership network that is well-institutionalized. Ohio TechNet’s colocation at LCCC is a great example.



DATA-DRIVEN COMMUNITY ENGAGEMENT

Data-driven approaches are used to implement inclusion and equity goals. LCCC’s work with Team Neo on Career by Design and its extensive engagement of the community in its strategic planning process are two great examples.



LONG-TERM INDUSTRY COORDINATION

LCCC programs take a regional purview, making long-term technology investments based on regional industry-wide process needs and using tech to facilitate industry connections.

KEY ROLES AT LCCC | LCCC administers the programs under study through a diverse combination of senior leadership, program-related, and institutional as well as advisory roles across the college.

SENIOR LEADERSHIP

1. Provost/VP for Academic Affairs & University Partnership
2. Dean, Engineering, Business, and Information Technologies
3. Dean of Accreditation & Assessment of Student Learning
4. VP for Strategic and Institutional Development
5. Director, School, Workforce & Community Partnerships
6. VP of Enrollment Management and Student Services

PROGRAM-RELATED ROLES

1. Asst. Prof., Program Coordinator AET Systems Specialist and Maintenance & Repair Program Coordinator
2. Director of MERIT & Asst. Professor of MEMS/MEMS Instructor
3. Manager of Training Programs, Automation & Robotics
4. Managing Director, SMART Microsystems
5. Director, Ohio TechNet and Director, Talent & Business Innovation

INSTITUTIONAL & ADVISORY ROLES

1. Institutional Research, Planning and Engagement
2. Manager of Career Services
3. Program Developer
4. Director, Talent and Business Innovations

ECONOMIC DEVELOPMENT ACTIVITIES | LCCC programs engage in almost all of the activities identified as important for community college engagement in economic development.

Education & Training Activities

- Hands-on learning
- Club/maker space
- Work-based learning (learn & earn model)
- Grants for equipment
- Dual enrollment
- BA pathway
- Credit for prior learning
- Short-term training/bootcamp
- Updated curriculum aligned with jobs
- Regionally aligned program with local workforce needs
- Industry advisory boards
- Community job fair
- Program job fairs/online matching with employers
- Hiring majority of program faculty from industry
- On-site employer visits
- National credentialing/industry certification

Business Support Activities

- Small business incubator and assistance
- Incumbent worker/customized training
- Entrepreneurship training
- Establishment of facilities for use by local companies
- Tech. transfer and applied research

Regional Engagement Activities

- Conducts economic scans
- Participates in local economic planning/policymaking
- Leading/coordinating other colleges on industry needs
- Leads on regional organizations or convenes regional stakeholders
- Participates in state/regional boards
- Assists in attracting employers to region

DATA SOURCES | These findings are based on a five-year study conducted by the Rutgers University Education and Employment Research Center in partnership with the National Science Foundation. As part of that study, the EERC team:

<i>Selected</i>	<i>Conducted</i>	<i>Conducted</i>	<i>Surveyed</i>
8	79	31	84
Best-in-class community colleges for intensive study	Interviews with college administrators, faculty, and staff	Interviews with colleges' employer & regional ED partners	Regional ED partners of the colleges, with a 37% response rate

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The Education and Employment Research Center

Rutgers' Education and Employment Research Center (EERC) is housed within the School of Management and Labor Relations. EERC conducts research and evaluation on programs and policies at the intersection of education and employment. Our work strives to improve policy and practice so that institutions may provide educational programs and pathways that ensure individuals obtain the education needed for success in the workplace, and employers have a skilled workforce to meet their human resource needs. For more information on our mission and current research, visit smlr.rutgers.edu/eerc.

EERC Areas of Focus

Community College
Innovation



Student Choices
and Pathways



STEM and Technician
Education



Noncredit Education and
Non-Degree Credentials



Education and Labor
Market Connections



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 consists 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. For more information, visit smlr.rutgers.edu.

National Science Foundation

The US 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 was \$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. For more information, visit National Science Foundation's Advanced Technological Education program: atecentral.net/about

