



ADVANCED MANUFACTURING:

A LOOK AT TWO OF OHIO'S MOST INNOVATIVE EARN-AND-LEARN MODELS

REPLICATION GUIDE

2020

COLUMBUS STATE
COMMUNITY COLLEGE

 **Lorain County**
Community College

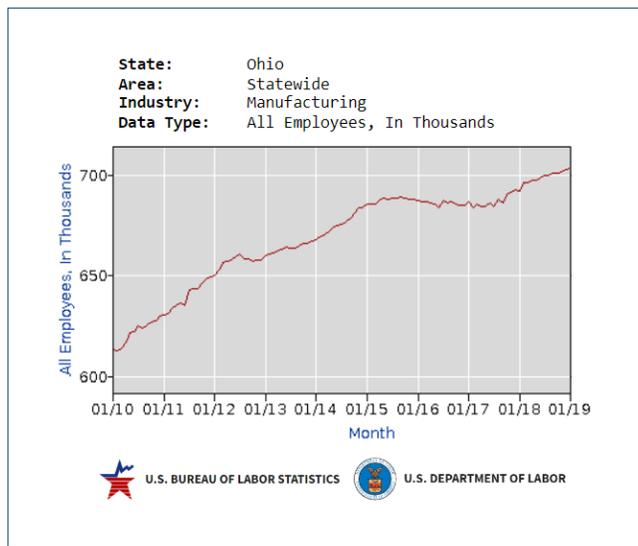


This material is based upon work supported by the National Science Foundation under Grant No. 1800612

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The Workforce Need



For decades, students have been encouraged to pursue a four-year degree, while the percentage of jobs requiring a bachelor’s degree or higher has risen only from 20 percent to 33 percent of total jobs between 1960 and 2018. In contrast, positions requiring technical skills skyrocketed from 20 percent to 57 percent of total jobs in that same timeframe. These data points, when paired with the demand for unskilled jobs dropping from 60 percent to 10 percent, there is a clear critical demand for workers with some postsecondary training (Fleming, 2012).

The technical skills shortage in the manufacturing industry is a widespread and often discussed problem. For U.S. manufacturers, 2 million out of 3.5 million jobs will

go unfilled over the next 10 years, and 84 percent of manufacturing executives agree that the U.S. manufacturing industry is seeing a talent shortage (Giffiet.al., 2015).

The Purpose

While the earn-and-learn models described within this guide are flexible and could be utilized for many diverse industries and occupations, this guides primary goal is to assist other institutions with successfully launching their own earn-and-learn programs leading to an increase in the number of qualified advanced manufacturing technicians in the State of Ohio. This guide identifies procedures for collecting and disseminating best practices for the development of earn-and-learn programs and acts as a springboard to share effective recruitment strategies for educator and industry partners.

Advanced Technological Education (ATE) NSF 17-568
Manufacturing Experiential Advancement Readiness Network (EARN) Project

Manufacturing Experiential Advancement Readiness Network (EARN) Project Narrative

Columbus State Community College (CSCC), in collaboration with Lorain County Community College (LCCC), and industry, state, and education partners will advance experiential work-based learning programming and outreach in order to increase the supply of qualified advanced manufacturing technicians. Work-based learning is not a new concept in education, however there is no existing coordination in Ohio that assembles and disseminates best practices and innovations in that space. Due to the strength of the industry in Ohio, and the program designs already in place at CSCC and LCCC in manufacturing occupations, the EARN Project will be uniquely focused on applications for manufacturing.

Snippet from the EARN Project Narrative

Industry needs vary by region and may require unique approaches to earn-and-learn program models as a result. This guide will highlight some of the strategies employed by Columbus State Community College (CSCC) and Lorain County Community College (LCCC) as guided by industry partners in their respective regions. The goal is to share various perspectives and examples that may assist educational partners in various regions throughout the state and beyond can development strategies that address the unique talent needs of each particular region.

The Earn-and-Learn Program Models

Central Ohio

Columbus State Community College

In 2013, [Honda North America](#) was feeling the impact of the region’s shortage of technically skilled workers. Honda’s biggest challenge was filling the mission-critical position of [Electro-Mechanical Support Technician](#). These technicians are highly trained professionals who serve as the backbone across manufacturing subsectors, providing design and maintenance support for production-critical systems.

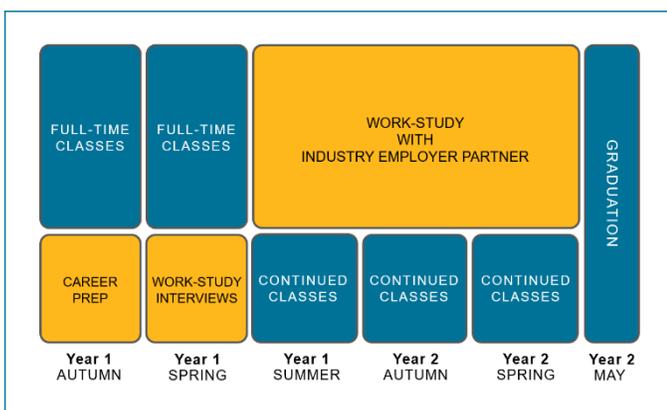


Columbus State Community College partnered with Honda North America on a root-cause evaluation. This effort resulted in the following key conclusions:

Quality: Participants of electro-mechanical technical programs would benefit from exposure to hands-on experiential learning that focused on mastering the skills Honda was looking for, leading to a high-quality talent pool that would then acquire additional training once hired.

Quantity: Honda’s talent pipeline was small and had a growth rate that had become stagnant. Likewise, Columbus State’s student enrollment pipeline into electro-mechanical engineering academic programs had encountered stagnant growth rate as well.

Future State: The demand for technicians in the State of Ohio would continue to increase in response to state-wide industry growth and natural attrition resulting from employee retirements.



Example of the MMWS Program at Columbus State

This partnership and evaluation resulted in the launch of Columbus State’s [Modern Manufacturing Work-Study \(MMWS\) Program](#) in 2013.

This CSCC earn-and-learn model was inspired by the traditional co-op model, which combines classroom learning with practical paid hands-on work experience, often rotating through full-time coursework and full-time work experiences. However, CSCC’s earn-and-learn model approach embeds students within a company for up to 18 months where they work part-time three days per week while also attending classes full-time two days per week. This enables students to apply what they learn in the classroom into a real-world work environment, building on their skills as they progress.

In this model, students begin the program majoring in one of Columbus State’s Engineering Technology programs. Their first two semesters are full-time classes, five days per week. These classes are front-loaded with the technical coursework that will help them develop the skills identified and desired by industry employers early on, preparing them for their placement with an employer at the end of their first year as a program participant.

At the end of a student’s second semester, students who successfully complete their career prep then have an opportunity to interact with regional industry employers at a centralized networking event. Once employers identify who they wish to interview, those students and

regional industry employers engage in a week-long interview process designed to create matches between student candidates with employer partners that have the highest potential for success.

In their third semester, students begin working with their matched employer as an earn-and-learn program participant. During their second year, students condense their class time to two days per week and work for their employer the other three days a week. These are paid part-time positions where students on average earn \$18 per hour, work 24 hours per week, for a total of 48 weeks. This ideally significantly offsets the burden of tuition costs.

By the end of the fifth semesters, students are equipped with an associate degree, have earned paid work experience in their field, have enhanced their technical skills, and potentially receive full-time job offers upon graduation from the employer they were placed with.

ELECTRO-MECHANICAL ENGINEERING ASSOCIATE DEGREE					
Summer	1st Semester	2nd Semester	3rd Semester (summer)	4th Semester	5th Semester
Advanced Automation Institute	First Year Experience	Physics	Robotics	Manufacturing Materials & Processes	Basic AC Electronic Systems
Manufacturing Plant Tour	Motors & Control Logic	Control Logic & PLCs	Welding: Intro Stick	Machine Tools	Data Acquisition Systems
	Industrial Applications & Software	Basic DC Electronic Systems	Basic Mechanisms & Drives	Social Behavioral Science elective	Humanities elective
	Engineering Graphics	Basic Digital Systems	CAD I		
	Mathematics	English Comp I	Technical Writing		
		<i>Interviews</i>	<i>Work Study</i>	<i>Work Study</i>	<i>Work Study</i>

An example of Columbus State’s Modern-Manufacturing Work-Study Program Curriculum



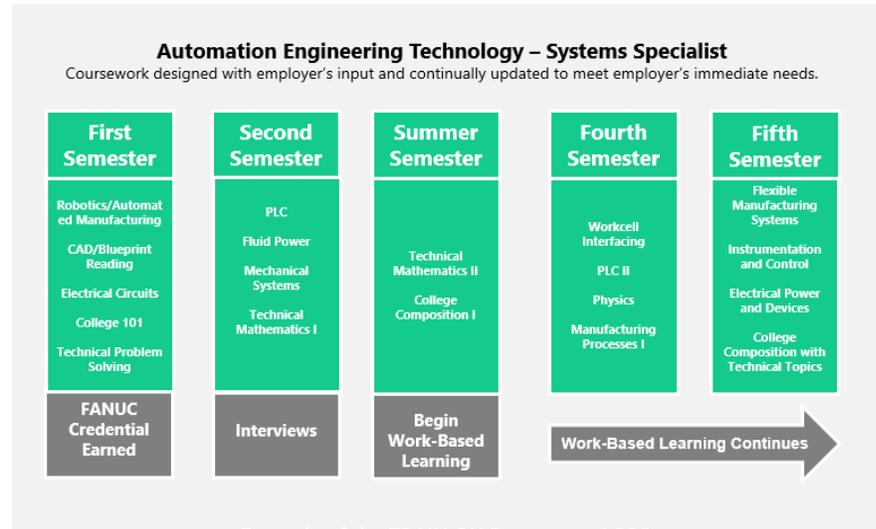
Northeast Ohio Lorain County Community College

In 2015, Lorain County Community College (LCCC) partnered with **Team NEO**, a regional economic development entity, to convene employers for the development of an earn-and-learn program. Similar to Columbus State, this earn-and-learn program model needed to take academic coursework and paid on-the-job work experience and blend them into a 21st century hybrid where companies and educators integrate activities.

LCCC wanted to tap into the collaborative manufacturing industry partnerships that already existed in the region. Many of these partners were involved with micro-electronic assemblies, flexible hybrid electronics (FHE), and were part of a **SMART Devices innovation cluster** led by Team

NEO. With strong support from industry partners, employers, and other manufacturing intermediaries, LCCC launched the first pilot of the [TRAIN OH](#) program in 2016. Lorain piloted this earn-and-learn model with a focus on [Micro-Electrical Mechanical Systems \(MEMS\)](#), an existing program of study at LCCC designed to operate in concert with its [SMART Center for Microsystems](#).

Student participants begin with two full-time semesters of classes front-loaded with technical coursework so that they develop the desired skills needed by industry employers. Most TRAIN OH students begin paid work-based learning after their second semester, providing students with early on-the-job training in high-demand fields. This earn-and-learn model makes a student candidate more desirable to employers. In addition to acquiring high-demand technical skills, student participants also gain early exposure to the job search process including resume building and interview prep. TRAIN OH allows students to attend school full-time two days a week and work on-site with their industry employer partner three days a week. Industry partners participating in the TRAIN OH program typically pay student participants between \$10.00 and \$14.00 per hour.



Example of the TRAIN OH Program at LCCC

FIRST YEAR			SECOND YEAR		
FALL SEMESTER		HOURS	FALL SEMESTER		HOURS
CADD 111	INTRODUCTION TO COMPUTER AIDED DRAFTING ²	2	DFAB 211	ADDITIVE MANUFACTURING AND 3D SCANNING ¹	3
CAMM 111	INTRO TO COMPUTER NUMERICAL CONTROL ²	2	DFAB 221	DIGITAL FABRICATION OF ELECTROMECHANICAL SYSTEMS ¹	3
DFAB 111	INTRODUCTION TO PERSONAL FABRICATION	1	ELCT 221	MICROCONTROLLERS ¹	4
ELCT 111	ELECTRICAL CIRCUITS I	3	ENGL 161	COLLEGE COMPOSITION I	3
SDEV 101	COLLEGE 101 ³	1	PHYC 150	GENERAL PHYSICS I ¹	4
TECN 111	TECHNICAL PROBLEM SOLVING	3		Hours	17
TECN 131	MANUFACTURING PROCESSES I ²	3			
	Hours	15			
SPRING SEMESTER			SPRING SEMESTER		
CADD 213	INTRODUCTION TO SOLIDWORKS ¹	3	CAMM 235	CAD-CAM GRAPHICS	3
DFAB 121	DIGITAL FABRICATION I ¹	3	DFAB 231	DIGITAL FABRICATION CAPSTONE	4
ELCT 115	FABRICATION PROCESS FOR ELECTRONICS	2	ENGL 164	COLLEGE COMPOSITION II WITH TECHNICAL TOPICS	3
ELCT 121	DIGITAL ELECTRONICS ¹	4	PSYH 151	INTRODUCTION TO PSYCHOLOGY or INTRODUCTION TO SOCIOLOGY	3
MTHM 121	TECHNICAL MATHEMATICS I	4	Arts and Humanities Elective		3
	Hours	16		Hours	16
				Total Hours	64

Example of LCCC'S TRAIN OH Program Curriculum

In addition to an engaged faculty, LCCC identified a program developer to assist with employer engagement, student placement and program expansion. In 2019, LCCC replicated the TRAIN OH model for automation and will soon implement the TRAIN OH program for other in-demand occupations.

Additionally, LCCC has developed an [Applied Bachelor Degree in Microelectronic Manufacturing](#) which allows student participants to continue in the earn-and-learn program even after completing their Associate Degree in MEMS.

Dissemination of Earn-and-Learn Models Impact Near and Far

Following the successful implementation of earn-and-learn program models that combine paid work-based learning with a college curriculum designed to meet regional industry needs, Columbus State Community

College and Lorain County Community College looked to replication and dissemination as a means of helping their respective regions of Ohio in closing the industry’s skills gap while also creating a new talent pipeline for employers.



OhioTechNet

Key to the dissemination of best practices throughout Ohio is Ohio TechNet, a consortium of eleven community colleges launched by Lorain County Community College in 2014 through a U.S. Department of Labor grant. Since then, Ohio TechNet has more than doubled in size and future expansion is anticipated. CSCC and LCCC have collaborated through the Ohio TechNet consortium, encouraging statewide replication of these models and providing technical assistance where needed. As detailed in the NSF EARN grant, this replication guide was created and shared to support dissemination of earn-and-learn program models in all regions of the state leveraging the [Ohio TechNet website](#).

Ohio Manufacturing Workforce Partnership

LCCC also recently won an investment from the U.S. Department of Labor to support statewide expansion of registered and non-registered apprenticeships in advanced manufacturing called the [Ohio Manufacturing Workforce Partnership \(OMWP\)](#). OMWP was activated to support this work and is structured through a partnership with the [Ohio Manufacturers’ Association](#). Target populations include adults across all ages, demographics, and income brackets throughout the State of Ohio. Over the course of four years (2019-2022) a significant portion of the \$12 million investment will be focused on building the industry’s infrastructure through regional sector partnerships, providing an outstanding opportunity to further replicate both the CSCC and LCCC advanced manufacturing earn-and-learn program models.



Another great source for dissemination is through the [Manufacturing Extension Partnership \(MEP\) at Columbus State](#). Funded in part by grants from the National Institute of Standards and Technology and the Ohio Development Services Agency — and with financial support from Columbus State Community College — MEP at Columbus State is part of a national public-private sector network. MEP at Columbus State combines the power of Ohio’s own MEP with workforce integration and consulting expertise from Columbus State. View the [MEP at Columbus State website](#).

Best Practices Through Shared Outcomes

The curriculum for each academic major that is aligned with an earn-and-learn program is tailored in collaboration with industry employers and emphasizes the early development of skills that fill industry needs. This approach has resulted in the following outcomes for both colleges:

Interest in High-Demand Career Fields

Employers and educators worked together to educate students about, and generate interest in, the current benefits of working in a high-demand career field.

Academic Retention and Completion

Academic advising, career preparation, and student support services are instrumental to these programs’ success. The goal is to support students in such a way that retain them through completion/graduation.

Recruitment of Quality Candidates

Created a competitive earn-and-learn program that students and employers saw the value of participating in because students were matched with quality employers, and employers were matched with highly skilled candidates.

High-Impact Partnerships Created

When Higher Ed representatives, Employers, K-12 partners came to the table together and created something that worked for everyone including students, the value is beyond measure.

Win, Win, Win!

Create a Scalable and Sustainable Model

If you have a grant or a short-term team working to stand-up an earn-and-learn model, you must ensure it is done in such a way that is sustainable once that funding source is depleted and is scalable so it has room to grow over time.

Communication is Key

Keeping everyone informed at all times is very important to the success of these programs. All parties need to stay plugged in and that happens through engagement. Educators must create touchpoints throughout an academic year that support student participants as well as employer partners.

Pipelines Created Beyond Community College

Whether a student is attending college to obtain new skills needed to join or rejoin the workforce, or whether they have goals of obtaining an undergraduate degree, pipelines beyond community college are key. Many times, employers offer tuition re-imbursement programs as well.

Accessibility and Affordability are Big Sellers

76% of students that graduate from CSCC or LCCC graduate debt-free. That number increases when the student also participates in an earn-and-learn experiential learning program.

The Replication Guide

Part I Roles and Responsibilities

A key component to the success of earn-and-learn programs is the identification and involvement of specific institutional individuals who play important roles. *(Please note that these roles and responsibilities have changed and evolved many times between 2013 and 2020. As is, these may not work for everyone and may need tweaked internally to make them meet your specific needs. The following roles and responsibilities are intended to serve as examples.)*

Academic Affairs (Leadership and Faculty)

- Engage participants in-and-out of the classroom to drive program success
- Participate in regional and community professional associations alongside industry experts
- Provide hands-on training to students
- Incorporate in-demand skills that will prepare students for entering the workforce, including professionalism skills, into the curriculum

Employer Engagement & Workforce Innovation Manager

- Works with employers to identify industry needs

- Engages faculty members when appropriate
- Serves as liaison between program and partner companies to ensure targeted goals are met
- Assists in identifying companies' talent needs

Experiential Learning Program Project Manager

- Works with employers to identify industry needs
- Engages faculty members when appropriate
- Serves as liaison between program and partner companies to ensure targeted goals are met
- Assists in identifying students to fulfill companies' talent needs
- Leads project planning meetings and oversees workflow of other experiential learning staff

Data and Reporting Coordinator

- Constructs sustainable data collection, tracking, and reporting operational procedures
- Assists grants with reporting out required data points
- Assists experiential learning staff with data needs

Marketing, Recruitment, and Outreach Coordinator

- Recruits student participants within the college and in local/area high schools
- Plans information events for students and parents
- Assists in coordinating recruitment events
- Serves as marketing liaison for experiential learning programs recruitment

Advising, Career Prep, and Student Support Program Advisor

- Builds relationships with students and connects them to campus resources
- Communicates with students on a regular basis to ensure successful program progression
- Schedules courses in block format as a cohort
- Works with career services professionals to provide career prep services to student participants

Participant Facilitator

- Recruits student participants within the college and in local/area high schools
- Assists in coordinating recruitment events
- Assists with submission and/or tracking of participant data

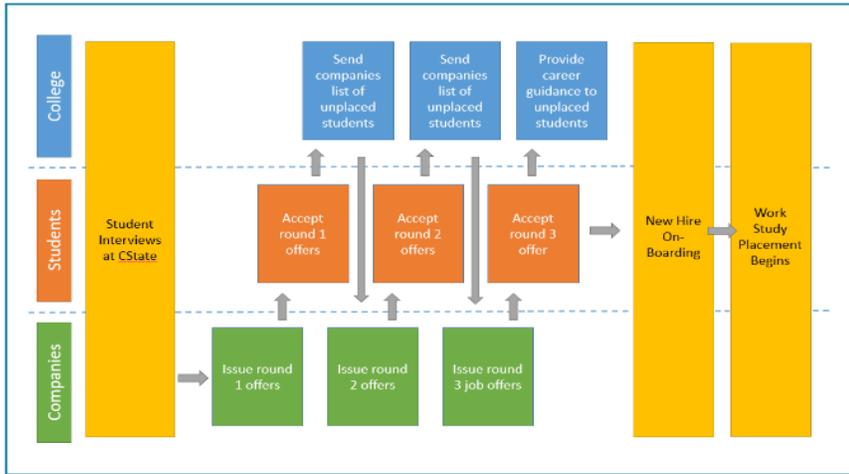
Part II Employer Engagement

Engaging regional industry employers begins with the research and development of an understanding of where skills gaps exist, and which employers have unfilled mission-critical positions. Both CSCC and LCCC have utilized the widely successful approach of involving industry leaders in development and evaluation of curriculum to ensure that the content



Columbus State's MMWS Program Employers Partners

of the program of study meets industry needs and readies students to take on full-time positions. This collaborative approach demonstrates to employers that the college is committed to sustaining a strategic talent pipeline through continuous improvement of academic curriculum and facilities.



Columbus State's MMWS Program Centralized Hiring Model

Columbus State Community College

has a dedicated institutional leader who heads the Workforce Innovation team, focused exclusively on continuing to develop and maintain business partnerships. The team ensures that all parties come to an agreement on the workforce need, the educational training required, and the commitment to hire qualified part-time employees. This employer engagement process culminates with a networking event, during which employers are invited to Columbus State's campus to meet with

students, who have qualified and become career "ready", in a "speed dating" setting. Resume books and elevator pitches are exchanged between student participants and prospective employers. From there, employers use a rating scale (1 = *Definitely Want to Interview*, 2 = *Might Want to Interview*, 3 = *Do Not Wish to Interview*) to share who they would like to select for interviews. Interviews are held in a week-long interview "palooza" on Columbus State's campus where students go through various rounds of offers for interviews with employers – after which, employers make students offers and the students choose to accept or decline. With this centralized hiring model, Columbus State is able to take on much of the heavy lifting so the employers can focus on the student candidates.

Lorain County Community College

employs a different strategy for employer engagement, which involves a two-step process of holding a kickoff meeting for interested employers and following up with personalized one-on-one meetings with company representatives. The Program Developer and key faculty leads meet with employers individually to customize a talent plan that addresses the company's talent needs and aligns with the TRAIN OH model.

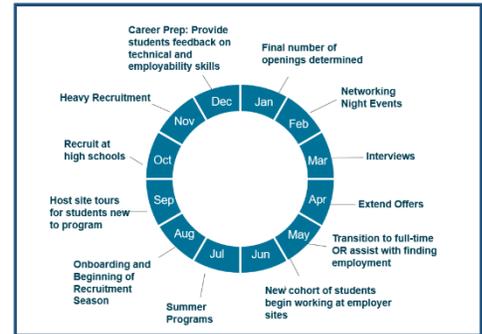
Advanced Staffing Solutions Owens Community College Southgate, MI	Aerotech Cincinnati State Technical and Community College Mason, OH	Betco Owens Community College Toledo, OH	Makino Inc Sinclair Community College Mason, OH	Mazak Cincinnati State Technical and Community College Florence, KY	Thomas Products Lorain County Community College Avon Lake, OH
Bi-Con Services Inc. Zane State College Derwent, OH	Continental Structural Plastics Owens Community College Toledo, OH	EMC Precision Lorain County Community College Elyria, OH	Patriot Stainless, Inc. USA Zane State College Zanesville, OH	Pioneer Pipe/Pioneer Group Zane State College Marietta, OH	Menuel Milling Owens Community College Fostoria, OH
Ergometrics Aerospace Sinclair Community College Huber Heights, OH	ESP America Manufacturing Sinclair Community College Troy, OH	General Plug & Mfg Co Lorain County Community College Grafton, OH	Flidco Lorain County Community College Westlake, OH	Quanex IQ Systems Zane State College Cambridge, OH	
GKN Driveline Owens Community College Bowling Green, OH	Global Precision Parts Owens Community College Ottoville, OH	Humanetics Lorain County Community College Huron, OH	Sauder Woodworking Owens Community College Archbold, OH	Staffmark Cincinnati State Technical and Community College Cincinnati, OH	
Island Aseptics Zane State College Byesville, OH	Jet Machine Cincinnati State Technical and Community College Cincinnati, OH	NAC Cincinnati State Technical and Community College Cincinnati, OH	Toledo Edison Owens Community College Toledo, OH	U.S. Bridge Zane State College Cambridge, OH	
Lincoln Electric Cuyahoga Community College Cleveland, OH	Lincoln Electric Lakeland Community College Cleveland, OH	Magna Exteriors Sinclair Community College Toledo, OH	PJ Trailers Cincinnati State Technical and Community College Bethel, OH	Renhill Owens Community College Toledo, OH	

A screenshot of LCCC's Employer Partners

Part III Participant Recruitment and Pipeline Development

The outreach model is built on the principle that it is essential to expose students to manufacturing before college. This exposure takes the form of developing partnerships with high schools, career centers, and community. The involvement of the college's admissions team and targeted recruitment strategies can play an integral role in engaging high school students and adult learners.

Some examples of recruitment events and strategies from Columbus State and LCCC are included below. Traditional events encompass activities coordinated by and with a college's admissions office. Nontraditional strategies include events that are shaped around the opportunity for industry/company exposure and may or may not involve the college admissions office.



Example of year one recruitment cycle for a CSCC MMWS cohort.

Traditional Recruitment Pipelines

Internal Current College Student Outreach

Create targeted marketing and information for current students enrolled in associated majors but who are not participating in the earn-and-learn model.

On-Campus Information Sessions

Sessions held on campus for area high school students and their families that include discussions with academic program faculty, current students, and employers. Adult learners are also included in these information sessions. Depending on the format, these sessions can be held every one-to-two months, quarterly, or biannually.



Off-Campus High School Recruitment

Meet on-site with high school junior and senior engineering classes to promote earn-and-learn and associated career pathways.

Off-Campus Recruitment Fairs and Conferences

Meet on-site with prospects at various recruitment table events and fairs as well as serving as vendors at conferences to promote earn-and-learn programs and associated career pathways.



Internal Partnerships Outreach

Utilize college faculty to reach out to current engineering and undecided students. Additionally, utilize college faculty and other campus contacts to reach out to high school pre-engineering faculty to identify prospective students.

College Credit Plus

Utilize college credit plus faculty and coordinators to reach out to current high school students and their parents that are enrolled in college courses through the college credit plus program.

Career Exploration Summer Camps

Create summer camp programs that allow high school juniors and seniors to explore careers that are built around the earn-and-learn model. These programs provide an opportunity for students to meet faculty, engage in hands-on lab experiences, and tour company facilities.



Adult Recruitment

Work with unemployed or underemployed adults to direct them to earn-and-learn programs.

Recruitment of Special Populations

Work with veterans as well as other community organizations that cater to special populations.

Social Media

Create a digital presence by posting program information, video clips, news, and success stories on college social media platforms such as Facebook, Twitter, LinkedIn and Instagram.

Large-Scale Recruitment Events

Develop local events and activities around Ohio's Manufacturing Day, which is held the first Friday in October each year. This will provide the opportunity for statewide exposure to the earn-and-learn program.



- **Panels:** Utilize students and partner companies to actively engage in recruiting events through participation in panels that are facilitated by college staff. Invite students and alumni to share their experiences with the program to give prospective students and parents a view of the benefits of involvement and a realistic understanding of the experience.
- **Campus, Facility, and Lab Tours:** Many times, prospective program participants don't realize how much community colleges have to offer in 2020. Bring them to your campus and wow them! Recruit faculty members to provide tours of engineering labs and other facilities to students and their family members. Engage employers through scheduled tours of their manufacturing facilities to illustrate how learning is applied.

Getting Creative

Bus Tours

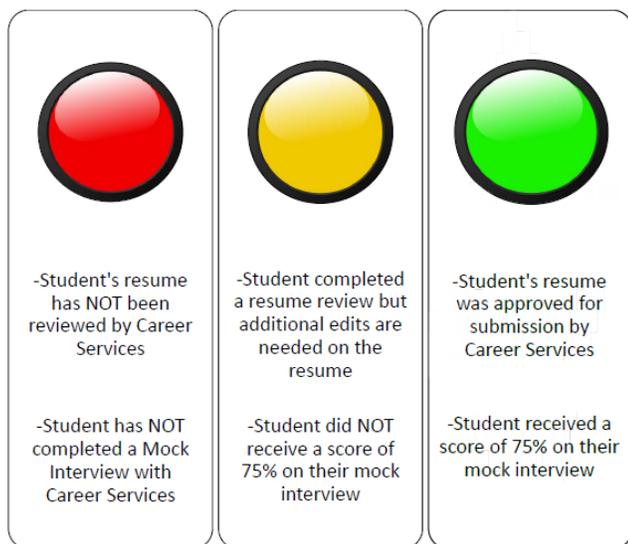
Take prospective educators, parents, and/or program participants, on a bus tour of the facilities of several industry employer partners so they can see how students and graduates apply their coursework as well as the opportunities and outcomes of these types of programs. Click here to read more about Bus Tours.



FlexFactor

FlexFactor immerses middle and high school students into the world of advanced manufacturing technology and entrepreneurship. Student teams are challenged to work together to identify a real-world problem that holds value to them, then conceptualize an advanced hardware device, develop a business model and pitch it “Shark Tank” style to a panel of education and industry representatives. Projects have ranged from earlier cancer detection to athlete safety and performance monitoring, to stopgap medical care for wounded soldiers and clean water access for inner-city residents.

Part IV Retention and Completion



A snapshot of CSCC's Career "READY" Model.

and in a cohort. A cohort structure enables students progressing through the earn-and-learn program allows for shared learning and peer interaction that enriches the overall experience for participants. Ultimately, this model can positively impact student retention.

As the program continues to grow, it is a best practice for colleges to create a custom “orientation to college” course that all college freshmen are required to complete. This course should be tailored with information specifically designed to support students in the earn-and-learn program. Examples of course content include resume writing, professional attire, interviewing preparation and skills, and communication.

In addition to the commitment of employers and academic faculty, it is crucial to have an academic and career advisor or counselor that is deeply connected to the earn-and-learn program processes and services to support these students exclusively. The key elements of advising and career prep services should be immersive in nature, abrasive in format, and occur at multiple touchpoints throughout the program design.

The advisor builds personal relationships with students and provides early exposure to college support services so that students are more likely to utilize them throughout the course of their academic program.

Additionally, the advisor should assist all students with enrollment and ensure that courses are block scheduled

Part V Evaluation, Reporting, and Measuring Success

Why Data Tracking is Important

Collecting data and evaluating program outcomes are essential for any work study program. In addition to building institutional support, these activities will improve the program's design and demonstrate its impact.

These types of programs must provide formal and informal evaluations throughout the experience and a final assessment from both the student and employer mentor – and faculty as well if possible. It is helpful to include an evaluation in the beginning as well as the end so that these earn-and-learn models include a reflection and evaluation process that shows the growth or development over time.

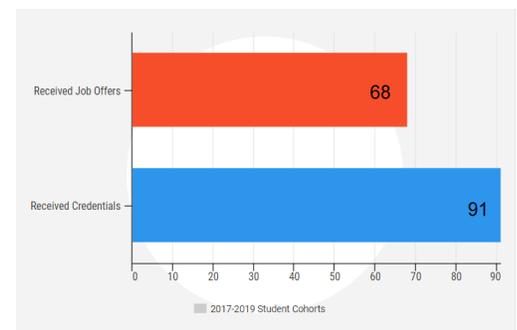
Consulting with the Institutional Effectiveness/Institutional Research Office on your campus is recommended to begin planning for tracking key metrics and to build content for surveys and other qualitative measures.

Measuring Success

Disseminating information regarding the experience of stakeholders, student outcomes, and employer engagement is essential for ongoing institutional support and success of the program. Some key metrics to track and report include:

- Number of students enrolled in earn-and-learn programs
- Number of students who interviewed for placement into a work-study position
- Number of students placed with employer partners
- Number of employer partners and their experiences
- Number of students transitioning to full-time employment with the same company
- Student graduation rates
- Number of students transitioning to full-time employment with the same company
- Opportunity to add measures related to academic improvement/curricular or equipment upgrades (e.g. within labs, classrooms, etc.)
- How was the students experience from the program, to the classroom, to mentorship and on the job training (OJT)
- The feedback of the employers, mentors, career coaches, and faculty. The feedback of these populations is extremely valuable. Take their feedback and use it to make improvements to the internal functions of the earn-and-learn model.
- Costs vs ROI; What did it cost to create and run the program versus the return on that investment

You may already have a department that focuses on institutional effectiveness within your institution. It is strongly recommended to collaborate with these individuals in identifying how your student system of record could be used to create compelling reports that can assist with program strategy and be used to predict future outcomes. An example of return on investment for student outcomes is seen to the left displaying job offers and credentials received for students who participated in the 2017-2019 and 2018-2020 cohorts of the MMWS program.



Challenges and Lessons Learned

Generate Internal Buy-In: Set up meetings, talk through options, identify challenges, and work through them collaboratively. Employer partners and student participants will follow once you have internal leadership and faculty on board.

It is important to have **multiple touchpoints with high school students** early in the fall of their senior year, as they begin making decisions about post-graduation plans.

Not all incoming students will pass the necessary requirements for math courses. With this in mind, room should be left in the schedule to accommodate **additional math courses**.

Students in economically disadvantaged school districts may experience barriers, including transportation to employment sites. To address this, **create relationships with employer sites close to the students home area**.

Recruitment of students from suburban districts may be challenging due to **misperceptions of the manufacturing industry** and the potential earnings and opportunities for growth it offers. To address this, recruitment efforts in these districts should begin at the parent level early on to gain buy-in before directly addressing students, and communication efforts should emphasize the important role that technology plays in modern manufacturing. When done in collaboration with the school district and employer partners, the message about the value of, and opportunity within, the manufacturing industry will be strengthened.

Information sessions are a proven outreach method for targeting the adult prospective student population.

The **military veteran** population is a particularly good recruitment source for the highly technical degrees, as their experience and technical training aligns with the requirements of earn-and-learn programs.

Many students are interested in achieving a degree because they understand that jobs are available upon degree completion. It is vital to **show the connection to a good job** and how the program/degree will get them there.

The tactic of **beginning earn-and-learn in the third semester** of enrollment is validated by company partners as well as educational institutions. The two prior semesters of technical coursework, while challenging, adds value for employers.

Institutional commitment will often require a cultural shift that should be anticipated. Making the necessary effort to build the buy-in of leadership is a key component of success.

Success Stories

Erica Miller

Graduate, Modern Manufacturing Work-Study Program
Columbus State Community College

As a child, Erica Miller always wanted to figure out how things work. That desire grew stronger as she got older and began taking classes at Columbus State Community College. Erica's professors and academic advisors helped her explore career options and, based on her interests and skills, encouraged her to enroll in the Modern Manufacturing Work-Study Program.



Erica has not looked back since. Her work-study position with Stanley Electric enabled her to apply what she learned in class and gain valuable knowledge from her supervisors and mentors who have years of experience in the field. After graduation from Columbus State, Erica accepted a full-time job offer from Stanley Electric.

“When I found out I could be a part of a program that would allow me to get paid doing something I enjoy and am in school for, while completing my degree and also having an opportunity for a full-time position with a great salary after I graduate – it seemed like a perfect match.”

Erica Miller, CSCC MMWS Graduate Class of 2018

Scot McLemore

Manager of Talent Acquisition and Deployment,
Honda North America, Inc.

Honda of North America is an example of an employer that has seen success in partnering with Columbus State. Through this partnership, Honda has a seat at the table to collaboratively discuss initiatives and strategy surrounding regional workforce skill needs and curriculum alignment. Honda is working toward meeting their workforce needs while also supplying opportunities to Columbus State students.



“The partnership between Honda and Columbus State is a unique collaboration, coming together to develop a curriculum, and offer opportunities that provide career-technical training.”

*Scot McLemore, Honda North America
Columbus State's MMWS Program Employer Partner*



Kraig Holler

**Graduate, Micro-Electrical Mechanical Systems Work-Study Program
Lorain County Community College**

Kraig Holler was working part time at an auto parts store when he developed an interest in the technology field. After learning of LCCC's Micro-Electrical Mechanical Systems (MEMS) degree program offered through TRAIN OH, he decided to enroll.

Kraig was hired by NanoBio, a tech development startup company almost immediately into his first semester. His position allowed him to gain hands-on learning and use the skills and knowledge he was taught in the classroom. After graduating from the program, Kraig was hired by NanoBio full-time as a Senior Engineering Technology Manufacturer. Kraig recently transitioned to a full-time position at SMART MICROSYSTEMS in Elyria and transitioned to participating in LCCC's [Applied Bachelor Degree in Microelectronic Manufacturing](#) which allowed Kraig to continue to participate in the earn-and-learn program even after completing their Associate Degree.

"Because of the experience I've gained along with way with working for NanoBio ... it's actually opened up more doors for me."

Kraig Holler, LCCC MEMS Graduate Class of 2016

Resources for Standing-Up an Earn-and-Learn Program

(The Nuts and Bolts Toolkit)

To view, click any of the supporting tools below:

[CSCC - Career Prep - Career READY Model Rubric](#)

[LCCC - Employer Agreement Form](#)

[CSCC - Career Prep - Career READY Model Scoring](#)

[LCCC - Participant Intake Form \(OMWP\)](#)

[CSCC - Career Prep - Mock Interview Rubric](#)

[LCCC - Scaling Apprenticeships Fact Sheet \(OMWP\)](#)

[CSCC - Career Prep - Resume Review Rubric](#)

[LCCC - Employer Partnership Guide \(OMWP\)](#)

[CSCC - Centralized Hiring Process Map](#)

[LCCC - Participant Checklist \(OMWP\)](#)

[CSCC - Curriculum - Front-Loading Technical Coursework](#)

[LCCC - Preliminary Meeting Getting Started Guide](#)

[CSCC - Employer Time Commitment Flow Chart](#)

[LCCC - Preliminary Meeting Planning Checklist](#)

[CSCC - Employer Update Newsletter](#)

[LCCC - Preliminary Meeting Sample Agenda](#)

[CSCC - Evaluation - Employer Feedback Session Agenda](#)

[LCCC - Preliminary Meeting Stakeholder Questions Guide](#)

[CSCC - Evaluation - Recruitment Event Report](#)

[LCCC - Replication Guide \(Train OH\)](#)

[CSCC - Initial Planning Flowchart](#)

[CSCC - Intake - Employer Partnership Agreement Form](#)

[CSCC - Intake - Participant Program Application](#)

[CSCC - Student Participant Informed Consent Form](#)

[CSCC - Participant Student Success and Advising Model](#)

[CSCC - Recruitment Brochure for Employers](#)

[CSCC - Recruitment Brochure for Students](#)

[CSCC - Recruitment Event Planning Checklist](#)

[CSCC - Recruitment Events Overview](#)

[CSCC - Recruitment Flyer for Employer First Contact](#)

[CSCC - Recruitment Planning Worksheet - Employers](#)

[CSCC - Recruitment Strategy Bus Tour for Educators](#)

[CSCC - White Paper on Earn-and-Learn Program](#)

Have Questions? Contact Us!

Ready to get started but have some questions or needs?

Contact us and we'll be happy to assist in any way we can.



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2020

REPLICATION GUIDE

ADVANCED MANUFACTURING:

A LOOK AT TWO OF OHIO'S MOST INNOVATIVE EARN-AND-LEARN MODELS



This material is based upon work supported by the National Science Foundation under Grant No. 1800612