Total: $397,014
Project Period: 05/01/2021 to 04/30/2024
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Other Personnel: Adjunct Faculty and Institute Outreach Coordinator

Columbus State Community College (CSCC), in collaboration with industry and education partners, will strengthen the engineering technology pipeline in order to increase the supply of qualified technicians with proficiency in modern technology in the advanced manufacturing sector. The project will look at the pipeline comprehensively and provide interventions at different points. The project will leverage multiple successful K-12 summer camp models at the College; collaborate with the regional Manufacturing Extension Partnership (MEP) to connect manufacturers and provide continuing professional training to the incumbent workforce; enhance existing curriculum with updates in the collaborative robotics subject area; and create a plan for upskilling incumbent workers

<u>**Project Goals, Objectives, and Deliverables**</u> - The goal of the proposed ATE project is to answer the demand for skilled engineering technology professionals through strengthening the K-12 pipeline, postsecondary programs, and workforce relationships. The following objectives are proposed:

Objective 1. Establish a Collaborative Robotics Center for teaching and learning that will engage students and employers by offering upskilling for employees.

Objective 2. Develop a recruitment initiative that leverages high school relationships to promote manufacturing career and academic pathways, enhancing the workforce pipeline.

Objective 3. Develop a recruitment initiative that leverages industry partnerships to promote upskilling thus creating more skilled technicians.

Objective 4. Develop a plan for Industry 4.0 Post-Graduate Certificates to be implemented

Based on these objectives, the project will create the following three deliverables:

1. **Manufacturing Summer Institute Model:** The project will design and implement a replicable and scalable, immersive summer program that readies high school students to enter postsecondary advanced manufacturing programs and provides industry context and applications that not only provide participating students with real-world project based learning, but that can be shared with high school instructors to implement in their classrooms. The project will prepare teachers to design curriculum through professional development around the institute work. One week of activities will occur once a month for three months. The three-program series will cover topics in (1) manufacturing foundations and tools of the trade (2) additive manufacturing and (3) cobots. Students may choose to enroll in one or multiple sessions.

2. **Collaborative Robotics Center for Teaching and Learning:** The project will develop a cobot learning classroom with multiple student stations and enhanced teacher demonstration capabilities. The classroom will be used for students in advanced manufacturing engineering programs and as a training center to address emerging workforce competencies of local manufacturers. The team will work with Marion Technical College to provide these resources to Marion-area manufacturers.

3. **Newly Developed Curriculum in Cobots:** The team will create both stand-alone and integrated curriculum that will give students and training participants experience and knowledge in collaborative robotics. By creating both credit and non-credit options, students have the option to build on existing knowledge or apply credits to their academic program in-progress.

4. **Industry 4.0 Post-Graduate Certificates:** The current workforce will benefit from ongoing professional development and learning opportunities. The team will conduct a series of occupation analyses compression planning sessions to gather industry feedback on up-and-coming workforce skills. Combined with a benchmark report on what training is and is not available in Ohio, the team will create a plan for

developing a series of post-graduate certificates that will provide skill-building for the smart manufacturing workforce. The plan will include a timeline, established program content focus, testing and validation processes, and a curriculum development plan. The development plan will also address any unique considerations for distance learning options and lab formats that arise from the pandemic environment. Student enrollment in these programs will occur after the project period, which provides a long-term goal for the team and is a sustainability measure to ensure this work continues.

Deliverable	Core Activities
1. **Manufacturing Summer Institute Model**	1. Create a plan, schedule and model for an immersive Summer Institute that readies high school students to enter manufacturing programs 2. Develop and implement an outreach promotion strategy to attract students and teachers 3. Develop an interactive high school professional development initiative that prepares teachers to design relevant and rigorous curriculum 4. Create evidence based evaluation baseline surveys for teachers and students 5. Create evidence based evaluation for pre/post student assessments 6. Launch Manufacturing Summer Institute Model 7. Create a technical guide for replication **[Product:** Evaluation assessments of both students and teachers**]** **[Product:** Technical Guide of best practices**]**
2. **Collaborative Robotics Center for Teaching and Learning**	1. Establish a cobot learning classroom with multiple student stations and enhanced teacher demonstration capabilities 2. Develop an outreach plan to high school and industry partners to attract students, educators, and industry to utilize the classroom 3. Collaborate with Marion Technical College to provide these resources to the Marion area **[Product:** Collaborative Robotics Center for Teaching and Learning**]**
3. **Newly Developed Curriculum in Cobots**	1. Host compression planning sessions with industry experts and faculty regarding the skills needed to work with collaborative robotics in industry 2. Collaboratively create and revise courses that align with industry feedback for credit and non-credit course offerings 3. Launch initial non-credit curriculum 4. Conduct peer review of non-credit curriculum and modify as needed 5. Launch for credit opportunities 6. Explore PLA opportunities 7. Map pathways to industry certifications **[Product: Smart Manufacturing Concentration]** **[Product: Collaborative Robotics Certificate in Smart Manufacturing]**
4. **Industry 4.0 Post-Graduate Certificates**	1. Host compression planning sessions with industry experts to determine necessary skills and knowledge for certificate program 2. Explore ways to have students certified with Columbus State and industry partner 3. Match credentials to TechCred 4. Create plan for implementing industry 4.0 Post-Graduate Certificates **[Product:** Comprehensive plan to implement Industry 4.0 Post-Graduate Certificates**]**