Center of Excellence FY23-24 Annual Work Plan – Q3 update

Center Name: Semiconductor and Electronics (High-Tech) Manufacturing

Directors' Quarterly Comments, Summaries, and Updates

For comments on the earlier Quarterly Summary, please see the last pages of this report.

FY23-24 Q3 – January, February, and March (Winter) ... due April 17. Send to Carolyn, Danny, and Vicky

- AWARENESS: Bought and received three robots. There are two humanoids and one life-size head. Each humanoid has 19 servos (motion), a camera (sight), and a speaker (voice). Assembled (mechanical and electrical) one humanoid robot. The robot has many preprogrammed skills to be downloaded and selected to run the routine. Added several routines, and in the last two weeks, I've been working on speech and recognition. The microprocessor can accept four programming languages, from simple block form to Python. Artificial intelligence can be used to create interactions and conversations. The robots are tools to show K-12 the possibilities of the future and include the basic building blocks of all robots. It will be showcased at the Spring Advisory Committee meeting on April 17, 2024.
- AWARENESS: Building a library of tools for K-12 events to showcase what Semiconductor and Electronics are.
    - Analog devices have provided material support with a cleanroom (bunny) suit. ADI also allows the center to barrow a framed board that shows the steps of the process from bare silicon to device product. Analog also joined me for a trip to the Wahkiakum SD Career Fair in early March. That was my third trip to Wahkiakum this year, where I provided middle and high schoolers with a look at the semiconductor industry.
    - SEH America is providing material support for the board. They will show the history and process of making a silicon wafer and the sizes of wafers as technology has improved. The smallest is 125 mm (2 in.) to the current wafer sizes.
    - Much appreciation to Analog Devices and SEH America for material and support. You are AWESOME!
- WORKFORCE: We continue to build a sustainable channel of qualified workers for the High-Tech Manufacturing industry.
    - Quick-Turn Training (or a similar program) proposal updates and meeting with statewide colleges to discuss and learn the challenges and gains of implementing a competency-based creditable program. Website
    - Engaged with Clark College and the Dean of WPTE/STEM, Theo Koupelis, and the department chairs from Automotive (Danny), Welding (Brian), Diesel Donnie), and Mechatronics (Ken and Tina) with the new Boschma Farms Advanced Manufacturing Facility in small ways. Theo and the chairs have come together to understand the project, find the gaps, and provide workable solutions. Also, I appreciate the Clark Foundation, Mortenson, and related project managers for their fantastic support.
    - Continue to update the SEMEWA.com website; the last web developer rescinded their offer of support due to internal issues. I recently hired a new web designer to continue working on the project. The vision of this site is to help each entity the center works with.
- PERFORMANCE EVALUATION: SBCTC will evaluate this center's performance on April 29. Requested and gained support from many of the Advisory Committee members. Are there any volunteers who can provide more feedback to the SBCTC program managers? Please let me know. The commitment is ~ 2 hours in the late afternoon.

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Core Expectations		FY 23-24 Work Plan Activity 1 of 4
☐ Equity & Access ☒ Sector Strategy ☒ Supply/Demand	☒ Economic Development ☒ Ed-Innovation-Efficiency	**Expanding the Center's reach and influence** While supporting the Clark College educational district, transition the center's roles and responsibilities from regional to state-wide functionality (aligning with all 12 centers of excellence operations).

Funding Sources %	Purpose	Projected Outcomes and Products	Status
CoE Allocation – 100%	Based on the current program inventory (see SBCTC SEM and AERO Program Listings), there are 23 Colleges with courses supporting high-tech manufacturing and another 8 with advanced mfg. programs for a total of 31 colleges that offer manufacturing training courses. Build alignments and collaborations.	○ Hire a Center of Excellence office administrator. ○ Visit 13 of 14 Technical Colleges within the State. ○ Compile a list of State Mfg. Businesses and specialties. ○ Meet with state industry leaders and share the center's vision and mission. ○ Expand the Advisors Committee to include statewide partners.	✓ Paused ✓ 6 of 14 ✓ Done ✓ WIP ✓ WIP

Report and Analysis of Actual Outcomes and Products

Quarter 1	**Plan** – **1)** Identify and plan trips to about half of the technical colleges with Mfg. programs. **2)** Interview potential office administrators to support the Center of Excellence. **Results – 1)** 13 Mechatronic program Colleges named Bellingham, Centralia*, Clark*, Clover Park*, Edmonds, Everett*, Green River, North Seattle, Olympic, Renton, Shoreline, South Seattle, and Spokane [NOTE: * = site visited]. **2)** I submitted the formal request from the Center to Clark College; I approved hiring a P/T admin.
Quarter 2	**Do** – **1)** Meet with the Identified college deans and lead instructors. Share High-Tech Mfg. CoE and to learn more about their programs and alignments. Validate their programs to active SBCTC Program inventory. Carl's file location → SEMCE_2023Sept-CollegeProgramInventory.xlsx **2)** Hire and train the Center of Excellence Administrator. **Result** – **1)** Delayed allowing the director to support NSF ACTN (Tri-State Development Engine) and take part in the WEC CLNA/Perkins V facilitator training. **2)** WIP – job description draft is complete. Working with Clark to supply admin training and office location. **3)** Done, List is complete/available, 255 Semi/Elec businesses in WA. Carl's file location → Semi_ElecMfg-255Employers_WA.xlsx .
Quarter 3	**Study** – Invite college deans to attend a consortium to discuss the results of the two DACUMS. Define what courses are common to all manufacturing: Advanced, Aerospace, Aeronautics, Clean Energy, and Mechatronics – what are the defined and controlling industry standards? Define whether the courses align or do not align with each specialty. Answer question – what are the common core courses for a career in manufacturing machine operations and technical support roles? **Result**—We did not hold a college consortium conference; we are meeting technical college faculty one-on-one. To date, 6 of 14 CTCs visited. Using industry DACUMs, Electronic DACUM, and known Mfg. KSA standards, the proposal is being vetted for a standard 1st QTR Mfg—basics course (competency-based).
Quarter 4	**Act** – Use results from the College Consortium to define the following steps to increase the efficiency and effectiveness of Manufacturing training. **Results** – .

Center of Excellence FY23-24 Annual Work Plan – Q3 update

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Core Expectations		FY 23-24 Work Plan Activity 2 of 4
☒ Equity & Access ☒ Sector Strategy ☐ Supply/Demand	☐ Economic Development ☒ Ed -Innovation - Efficiency	**K-12 - Continue Student engagements to promote Industry Awareness and Engagement** Support opportunities to increase awareness and engagement with K-12 students, CTE Directors, and CTE Teachers about semiconductor and electronics manufacturing careers. Take local lessons learned and share statewide. NOTE: This ongoing multi-year project leverages work that Career Connect SW started and included the partnership of Semiconductor & Electronics Manufacturing Center of Excellence, created in FY21-22, FY22-23 Q3, and now FY23-24 growing successes.

Funding Sources %	Purpose	Projected Outcomes, Products, Completion Date	Status
• CoE Allocation – 90% • ESD112-CCSW – 10% • Analog Devices – 33%	Create engagement activities with K-12 education students and High-Tech Manufacturing.	○ Utilize all tools and processes to build awareness of high-tech mfg. in the K-12 grades. ○ Create 8-10 Industry/student engagements annually within ESD 112. ○ Share the model with other Educational School Districts to Support their actions. ○ Engagement types: Show & Tell, Facility Tours, Internships, Externships, and Flipped Internships.	✓ On-going ✓ 3 more Q3 ✓ pending ✓ pending

Report and Analysis on Actual Outcomes (Provide all products electronically via email attachment or link)	
Quarter 1	**Plan** – Identify and schedule 12 engagement opportunities between education and industry. Support CCW in developing engagement-type playbooks. Share with districts. **Results** – On Nov. 7, I will visit Wahkiakum High School to engage with students and share career paths and examples of working in semiconductors and Electronics. Also, working with WSU Wahkiakum Extension, I plan to visit more regional schools. Continued engagement with CCSW/ESD-112 with goals to increase internship engagements and active participation in CCSW's Dual Credit and Postsecondary Readiness Work Group.
Quarter 2	**Do** – Conduct, monitor, and list all engagements the center supports. **Result**—I completed three middle/high school awareness engagements, all supported by Analog Devices (materials) and the WSU-Wahkiakum extension. Career Connect SW / ESD112 is leading K-12 Awareness projects and working to increase industry-student-educator engagements.
Quarter 3	**Study** – Evaluate results of engagements, effectiveness, participation, and return on investment for both parties. **Result**—Based on all earlier Awareness engagements, we are improving engagement by using the following tactics: Wear semi-casual clothes like teachers/admins, use tools and props (wafer board, Robot, Microscope, and cleanroom suits to increase wonder We also offer treats and reward students for engaging. We brought Analog Devices to the Wahkiakum SD Career Fair and implemented all changes, best results so far!
Quarter 4	**Act** – Seek additional student/industry engagements. **Result –** .

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Core Expectations		FY 23-24 Work Plan Activity 3 of.
☒ Equity & Access ☒ Sector Strategy ☒ Supply/Demand	☒ Economic Development ☒ Ed -Innovation - Efficiency	**Support the Implementation of Quick-Turn Training (or a similar training approach) at Two High-Tech Mfg. Clusters.** Use Quick-Turn Training Proposal to share vision and mission among visited colleges. Develop and implement manufacturing training that uses a compressed training schedule (Days/Weeks) to enable the student to complete the first quarter of the curriculum. Provide DEI access with attendance stipends, childcare, and bus passes (or state car-pool van). Industry support in the form of Prof/Tech skills DACUM development and creating availability of internships while students learn.

Funding Sources %	Purpose	Projected Outcomes, Products, Completion Date	Status
• CoE Allocation – 20% • Education – 25% • Industry – 25% • Partner(s) – 30%	Expanding qualified worker learning programs to under-represented populations. Enable the individuals to receive instruction to support entry into high-growth & family-wage careers.	○ Increase the diversity of students with extraordinary short-term support. ○ Increase the availability of qualified workers for industry. ○ Create a working model of Quick-Turn Training that will attract persons who may not have considered they can take part in America's growing industries and build a secure future.	✓ w/ESD112 ✓ WIP ✓ New realistic model

Report and Analysis on Actual Outcomes (Provide all products electronically via email attachment or link)	
Quarter 1	**Plan** – Complete a Manufacturing Technical Skills DACUM. Gain the participation of multiple manufacturing industry representatives. Seek results buy-in and support from state partners (Community Support Entities, Education, and Government). **NOTE:** Manufacturing Professional Skills DACUM completed Feb. 2021 and is on file. **Results** – I have met with and shared the QTT (Quick-Turn Training) vision with several entities; all support the vision. Participated in CWWC (Columbia-Willamette Workforce Collaborative) Tech Sector Training Symposium, SEMI.org training program discussions and applied to become a member and accepted – dues payment pending, NSF PNW Development Engine, a collaborative with Idaho State University, Oregon State University, and University of Washington. I learned of SAMU, an industry-driven Semiconductor Preparation and Technical Training program. However, there is little forward progress related to QTT.
Quarter 2	**Do** – Use both Professional and Technical DACUMs to structure multi-level manufacturing training. Define courses needed for 1st through 4th quarter training. Align standard courses that meet multi-industry manufacturing requirements for advanced aeronautics, aerospace, clean energy, and mechatronics. In addition, call out requirements for ~~badges and certificates~~ micro-credentialling for student awards. **Result**—DACUM: Ask for quotes to perform, with agreement, then schedule with the High-Tech Manufacturing industry.
Quarter 3	**Study** – Complete the Micro-credentials model using current course outcomes. Share results with other Mechatronics Colleges. Receive statewide feedback. **Result –** Remodeled Quick-Turn Proposal using Clark College's active curriculum. We will use this as a discussion topic at each College Technical Mfg. school visited.
Quarter 4	**Act** – Find strengths, weaknesses, opportunities, and threats. Map path for improvement, expansion, and distribution to other manufacturing fields in Washington State. **Result –** .

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Core Expectations		FY 23-24 Work Plan Activity 4 of 4
☒ Equity & Access ☒ Sector Strategy ☒ Supply/Demand	☒ Economic Development ☒ Ed -Innovation - Efficiency	**Career Path Mapping for Semiconductor and Electronics (High-Tech) Manufacturing Industry** The last Career Path Map for Semiconductor and Electronics Manufacturing was created in 2019, over 4-years ago. Working with Clark College and Career Pathways, we can supply a new multiple pathways map to support students in finding a best-fit path. Thereby supporting students and working learners to gain employment in the manufacturing and related supply chain industries.

Funding Sources %	Purpose	Projected Outcomes, Products, Completion Date	Status
• CoE Allocation – 33% • Partner(s) – 33%% • Education – 33%	Support the development of quick-turn training, student Boot Camps, and pre-apprenticeships. NOTE: This is a continuation of FY21-22 and FY22-23 Activity.	○ Multi-pathway graphic map: Direct to Education, Direct to Employment, Hybrid of education and employment. ○ Include a pathway through Quick-Turn Training into an internship, part-time, and full-time employment while accelerating their career/wages through continuing education.	✓ Done ✓ full industry support. College's interested.

Report and Analysis on Actual Outcomes (Provide all products electronically via email attachment or link)	
Quarter 1	**Plan** – Create a project with Clark College departments, Career Pathways, Student Services, and Career Services. **Results** – Internally developed two draft diagrams for pathways to High-Tech Manufacturing Careers (see appendix A).
Quarter 2	**Do** – Begin pathways mapping processes and seek stakeholder feedback at each draft iteration. **Result** – Joined Dean Theo Koupelis' WPTE Chairs Team to support vocational education and resolve issues related to the new Boschma Farms facility. Quick-Turn Training: Have a scheduled meeting with Alissa Sells (SBCTC Policy Associate, Educational Resources & Innovation) on February 12th. It will support a deeper dive into using and creating standards to implement Micro-Credentialing Statewide. Also, fine-tuning vocational curriculum outcomes into Micro-credentials.
Quarter 3	**Study** – Understand statewide micro-credential use and the process of implementing college policy. **Result –** Each tech college visited is provided feedback. Distilling information into a cohesive plan is challenging, Continue gather support and aligning on content.
Quarter 4	**Act** – Next step based on results from Q3. **Result –** .

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Appendix A – High-Tech Manufacturing Career Pathways

FY22-23 Q4 – April, May, and June (Spring) ... Report released mid-July 2024

FY23-24 Q2 – October, November, and December (Fall) ...

- The Semiconductor and Electronics Manufacturing Center of Excellence (SEMCE) continues to grow (along with the director) to support the two primary objectives: Industry Career Awareness and Improving industry worker training and attendance.
- CLNA reports are due from every state college by January 31, 2024. All WEC CLNA Facilitator training to support Colleges is complete. This training supported learning about the CLNA and Perkins V, and another process the colleges must complete for the state to help the college meet its community needs.
- SEMI.org and the PNW Chapter – All dues are paid. The SEMCE is a member of both.
- Participating in NSF ASTN (Advanced Science and Technology Network) as a member of a tristate workforce group.
- 2nd Semi-Annual SEMCE Advisory Committee meeting was completed on October 18. In attendance were 13 participants (most so far), which included 5-Clark College principles, 1-ESD112/CCSW, 1-WSW, 1-WSU-V, 1-ADI, 1-Chelan, 1-VancouverUSA, 1-AJAC, and 1-CREDC. The goal is to add more from industry and statewide entities. We must offer an online option to support adding statewide partners while keeping as many people as possible at the event. A straw poll was conducted with all attendees: "***Define two objectives you believe to be a top priority for the Center in the next one or two quarters.***" Carl's file location → Straw Poll results and responses. Provided upon request.
- The Center is gathering training aids to increase interest and show how semiconductors/electronics are made and used. Training aids collected so far: Wafers, Bunny Suits, Posters (compliments of Analog Devices), a bunny (cleanroom) suit worker cutout – for student pictures, and recently, a 12" humanoid robot. The Robot has the same hardware functionality and sensors as commercial robotics (The director is learning, assembling, and programming to interact with event attendees). The Center will add a 3D printer to make skins and features this month.
- ***For all referenced documents*** – the links provided enable quick location and sharing with individuals as asked. Please let the Director know if you would like a copy sent.

FY 23-24 Q1 – July, August, and September (Summer)...

This summer, the Centers' growth activities increased the network to include semiconductor industry representatives and related workforce collaborations.

- Completed a NEW Website and posted it with the support of Nexus Web Design (All recent Clark Graduates) – I am still adding content.
- SEMI.org – met with Lin Tso and Eric Rude to discuss the benefits of a PNW Membership. Dues are $950 annually. https://semi.org/en/workforce-development . I presented to the PNW Chapter on WA State Centers of Excellence and specifically the SEMCE (our Center),
- NSF ASTN (Advanced Science and Technology Network) is a formation of three states: Idaho, Oregon, and Washington. NSF Engines Development PNW and the Center are part of the Workforce development workgroup.
- WA State Department of Commerce supports workforce and manufacturing development. https://www.commerce.wa.gov/
- Equus Workforce Solutions – learning about apprenticeship programs via WIOA (Workforce Innovation and Opportunity Act). https://equusworks.com

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- Attended the Machinists Institute Advisors board meeting. September 28 is the start of the Industrial Machinery Technician apprenticeship program. Want more Industrial partners, https://www.machinistsinstitute.org/pre-apprenticeship
- CWWC (Columbia-Willamette Workforce Collaborative) conference with 35 persons attending from Oregon and Washington. Participated in Breakout session #7, which was related to which occupations and types of certifications are available. Generally covered high-tech fields from data to software to high-tech manufacturing.
- Attended the Career Connect SW K-12 program implementation team meeting. Discussed the many ways to get in front of the children to bring awareness of future careers and paths to get there. I also reviewed ways to engage the industry to take part via internships, externships, Show & Tells, problem-based learning exercises, etc. Then, a week later, I attended the CCSW Regional Advisors meeting.
- WEC – CLNA Conference Every College should have a completed CLNA, which then can be used to support a Perkins Award,

  Perkins dashboard, https://www.sbctc.edu/colleges-staff/research/data-public/perkins-dashboard.aspx
- Met with Robert P. Pellegrini to discuss Intel training programs. Robert is the Fast Start Director based in PNW and works closely with the Oregon Employment Service Department (OR ESD) and Portland Community College (PCC-Hillsboro). The OR ESD finds students to begin Intel's Quick Start Training. A 2-week (~64 hours) introduction to Intel manufacturing. Students are paid a $500 weekly stipend (while attending classes). Classes consist of online webinars, lectures, and tests. Student performance is evaluated at the end of the program, and Intel selects the top candidates. These candidates will go through interviews with Intel area managers. With a successful interview, the candidates will begin a mentorship training program lasting up to 2 years, typically 6 to 12 months. The students may transition from temporary to full-time Intel employees after successful training.

  https://www.pcc.edu/opportunity-center/jobs/semiconductor/
- Met with Amesite to review their AI-powered eLearning programs. It is very intriguing, and I think it can be helpful to supply a virtual reality lens into many facets of Manufacturing learning to remote K-12 schools. Cost is $35 per user. More to learn about them. https://amesite.com/