Whitehall Regional Emerging Technology Education Center

Comprehensive Operational Plan

July 24, 2023

Mission:

The Whitehall School District has long been a leader in terms of advanced technology instruction at the secondary level and with the addition of a newly remodeled educational facility, the District creates a fixed location program that serves the northern and central regions of Trempealeau County in the areas of emerging technologies in a modern and flexible learning environment focussed on knowledge and skill development as well as industry recognized credentials that provide a wide range of future opportunities including high skilled employment and post secondary educational opportunities. The District, as part of the well established and valued partnership with the many facets of Ashley Furniture and the Wanek and Dotta families, looks to continue to better serve the students in our rural region of Wisconsin by creating a one of a kind, well equipped and professionally lead and highly collaborative Regional Emerging Technology Education Center that will serve all K-12 students of the schools of the Trempealeau Valley Cooperative as well as Osseo-Farichild and Eleva-Strum.

Location:

The Whitehall Regional Emerging Technology Education Center will be housed in a stand-alone 16,000+ sq.ft building just across the street from Whitehall Memorial Schools. This newly renovated space will create an atmosphere focussed on the futures of our students while preparing them for the continued evolution of technology in all aspects of their worlds. This center will be open both during the school year as well as during the summer and in addition to the normal day, will be used for after school opportunities and programming related to emerging technology and automated systems.

Staff members and qualifications:

Kristoff Ausderau

- Whitehall High School Graduate
- Graduated from University of Wisconsin - La Crosse
    - Major: Mathematics
    - Minors: Computer Science and Computational Science
- 13 years teaching experience mathematics, computer science and robotics

Alex Eid

- Whitehall High School Graduate
- Graduated from Winona State University - Elementary/Middle Education
- 7 years teaching experience
- Mobile Skills Lab instructor for the past 3 years.
- FCR-01 FANUC Certified Robot Operator-1
- SACA Certified Industry 4.0 Associate - Basic Operations Silver and Gold
- SACA Certified Industry 4.0 Associate - Advanced Operations Silver and Gold
- SACA Certified Industry 4.0 Associate - Robot System Operations Silver
- SolidWorks Associate - Mechanical Design

Professional Development for Staff:

Staff will work with LAB Midwest to complete equipment training and implementation as well as engage in regular training as well as identify and engage in professional stretch opportunities pertaining to emerging technology.

Who will be served:

All K-12 students of the schools of the Trempealeau Valley Cooperative as well as invitations extended to Osseo-Farichild and Eleva-Strum.

Initial served student targets:

The initial students served target will be 150 students participating per year with 50 industry recognized certifications per year. The equipment will be used daily in the 10 classes taught between the two instructors each trimester. There will also be programming during the summer school sessions where the equipment will be used. **Note:** The number does not include elementary students or students from other program areas that may be served in full or part inside of the Center. It is estimated that another 250-400 students will be impacted by the Center and its programming. We will clarify these targets as we build programming and activities during SY 2023-24.

Equipment and Curriculum:

The equipment listed below will be used by a variety of classes and modules including SolidWorks, STEM Lab, Introduction into Emerging Technologies, Computer Programming, Industry 4.0 courses, Computer Science Principles and Robotics. The combination of the new facility, equipment and accompanying curriculum will allow us to deliver the content in a modular fashion. Students will be able to select modules of content based on their current knowledge and experience. This will allow greater flexibility to meet the students' needs. Students will no longer be locked into a fixed schedule but will be able to select

the class or module they need when it fits into their schedule. Students (and staff) will be able to access desired content and exposure in as limitless fashion as we can currently define.

PC's

The PC's will be used in the SolidWorks, computer programming and Industry 4.0 course 3 classes as well as a variety of other classes. These high end PC's will have the computing capacity to handle ROBOGUIDE which allow students to create digital twins of the robotic arms cells in the lab.

Ultimaker 3D printers, MarkForge 3D Printer and Resin 3D Printer

The 3D printers will be used in SolidWorks, entry level engineering classes as well a variety of other classes for small projects such as a weather station and self watering planter.

4' x 8' CNC Router Machine, Laser Engraver, 4'x8' CNC Plasma Cutter, CNC Router 32"x24" Workstation

The routers, plasma cutter and laser engraver will be utilized to create projects to peak students interest and help build a broad base on content knowledge. Students will incorporate CAD and the design process when using these tools to create the structure components for larger projects. The laser engraver will be used to create smaller quick automation projects like an automated Valentines Day card box. The laser engraver will also be used in proof of concept projects. The routers and plasma cutter will allow students to use CAD to create precise final versions of components for projects. These tools will be used heavily in our Introduction into Emerging Technologies classes.

Machine Learning AI Workstation

The AI workstation will be used to teach students how to implement artificial intelligence programs. The AI workstation will also be used to implement digital twin educational programs in the future. This high end workstation could also be used to teach students about blockchain concepts. The AI workstation will be incorporated into the existing AP Computer Science Principles class.

Academia Peel 3 Scanner

The 3D scanner will be used in the Introduction into Emerging Technologies class to teach the students the tool as an emerging technology. It will also be used to scan objects to incorporate into digital twin sets in ROBOGUIDE.

Game Development Foundations, Game Development I & Game Development II

Semester courses which give students an introduction to game development software, skills and best practices. These courses use the excitement of creating games to teach computer science, math, and problem-solving.

MINDS-i Drones Lab Ground & Aerial Drones

90 hour curriculum by MINDS-i is a cutting edge lab that allows students to build and program both a UAV and UGV rover. This engaging STEM lab is a great introduction to a variety of useful STEM concepts. The MIND'S-i drones can be integrated into existing classes or as a new stand alone class drones class.

Arduino Robot

Arduino Robot Kit by MINDS-i is a great introduction to programming for students. Through building their own robots with the provided kit users are able to learn the basics of robot programming with a direct application. The robot comes with approximately 20 hours of curriculum. The Arduino Robots will be included as an introductory unit into Arduinos in the Introduction Emerging Technologies class.

Electric Car Lab

The 45 hour curriculum that accompanies the MINDS-i electric car teaches students the basics of electric cars, variables of force and motion and electrical engineering & energy transfer. This curriculum would be suitable for 7th to 12th grade students. This curriculum will be used to introduce students to electric car concepts and is a valuable precursor to the more advanced Quanser Self Driving Car STEM Experience

EDU-MILL

The EDUMiLL is a revolutionary system that incorporates technologies from the additive and subtractive manufacturing fields which include a 3D printer and a robust CNC mill in one package. These will be used to complement the SolidWorks course along with the emerging technologies and Industry 4.0 courses.

FANUC CNC Simulator Machining Simulator & CNC Concepts Curriculum

CNC Simulator by FANUC provides an advanced manufacturing experience for learners and an understanding of machine operations without the need for a full manufacturing system. The CNC simulator can be used in the Amatrol e-learning system and to supplement the Industry 4.0 courses.

Frenceless CRX-10iA R-30iB Plus Mini Education Cart

Industry 4.0 course 3 and automation project integration

Vision for FANUC Arms, Free Standing Conveyor, Tabletop Conveyor and APT PLC/HMI, Rockwell eLearning

Industry 4.0 course 3 and automation project integration

Industry 4.0 Course Equipment with CRX Robotic Arm Smart Factory (Note: This grouping of equipment replaces all necessary items currently present in the MSL)

Industry 4.0 courses 1-4

OTTO 100 AMR Learning System

In the OTTO 100 AMR Learning system the students will learn to program, operate, troubleshoot and maintain the OTTO 100. They will also work up to more complex applications like integration with other automation technology such as collaborative robots, fleet management, production planning, data analysis and process improvement.

Qbot 3 by Quanser

The QBot 3 is accompanied by extensive courseware for teaching advanced robotics and mechatronics. The courseware laboratory exercises are organized in a set of independent modules, allowing professors to select and adapt them easily for an existing course, or build a new course.Because of its design and open architecture, the QBot is

versatile enough to enable users to add other off-the-shelf sensors and customize the QBot 3 for their research in areas such as vehicle navigation and control, autonomous vehicles control, machine learning, and computer vision, multi-agent heterogenous and swarm robotics, and more.

Self Driving Car STEM Experience by Quanser (3-Cars)

The Self-Driving Car STEM Lab is designed to teach engineering, data science, math and technology to students. Students get hands-on insights into the different artificial intelligence applications running on the system. Through games and challenges via the tablet interface, students can understand the different pieces of the Intelligent System, including See, Think, Do and Talk.

Marketing plans:

The District will regularly and actively market the programs that are available in this facility in a variety of means listed below:

1. Annual open houses will be held each fall and spring. The fall event will be held in conjunction with our normal “Back to School” activity. The spring event will take place in April to highlight the year’s activities and plans for the following year.
2. Monthly public statements (eg. press releases, posts, media visits) will be created and shared with local media, partners, other schools involved with the program and the District's social media outlets to promote enrollment and participation as well as recognize donors. Social media posts will link whenever possible to any entities that support the mission of the Center.
3. Promotional videos will be created and distributed at least once per trimester. These videos will share the happenings of the program as well as other related information including but not limited to references to future regional career need/opportunities, the need of a positive balance of trade and future goals or needs of the program.
4. Visits and tours from interested groups will be honored and encouraged whenever possible. Visits will not be limited to Whitehall School District students.
5. Digital signage in all high school buildings will have live video access to the happenings and programming at the Center. The District will schedule opportunities to show what is happening inside

of the Center to student bodies in general in any interested schools or partners with the necessary capability.

6. Annual visits will be made to all TVC 2.0 schools as part of the pre-scheduling process to share what is available to students.
7. Regular visits and tours will be set up for elementary aged students from all interested TVC 2.0 schools to both see and participate in activities within the Center.
8. Regular discussions and presentations will take place with additional District staff members to identify and develop co-teaching or blended educational opportunities.
9. Display cases will be added to the facility for 2025-26 to highlight and archive student projects.
10. Outreach will be made by Center staff to offer opportunities for other partners to sponsor areas or needed additions to the program starting in 2025-26.

Progress Reporting:

1. A calendar of events will be created prior to July 1 for each subsequent school year and this calendar will be shared with any and all partners of the Center as well as with the Advisory Board.
2. An annual report for the Center will be created for each school year and be available for review by June 30 of each year. The annual report will include:
    A. All promotional efforts planned and executed to encourage students, families, school board, faculty, community members, and organizations such as DPI, DWD, WEDC, WTCS, and UW System to learn about the Program. Promotional efforts can include, but not limited to: Open house events, press releases, videos for media distribution, published research articles, media events, etc.
    B. Number of students who enroll and complete the courses within the Program, by trimester and from each participating school district.
    C. Number of students that earn Smart Automation Certification Alliance (SACA) credentials, by trimester and from each participating school district. For students that earn multiple certifications, this will need to be clearly explained. Additional industry certifications earned that are applicable to the Program, will also need to be clearly explained.

D. How post-secondary education and industry are connected with the Program.

E. Detailed description that explains professional development activities for educators that are scheduled to occur and have occurred throughout the school year.

3. As noted below under the Advisory Board, new and updated benchmarks will be created each year to allow for appropriate and definable goals and evaluations of success.

Initial Benchmarks:

2024-25

The District will create multiple displays that are clearly visible within the Center. These displays will assist in developing an understanding of a Positive Balance of Trade and what manufacturing brings to an area as well as the overall evolutionary history of technology. These displays will be referenced regularly during classes, open house events, tours, and other promotional efforts by the school district.

By the end of SY 2024-25, the school district will develop a plan that can encourage learning the Program through summer school offerings (elementary, middle and/or high school).

By end of SY 2024-25, the school district will develop and define an active **Advisory Board** that will:

i. Encourage student learning and positively connect students with industry and post-secondary education.
ii. Serve as ambassadors of the equipment and curriculum taught within the Program.
iii. Provide a connection to an ongoing exchange of information and ideas with members of the community and a broader society.
iv. Provide recommendations that will support the growth of the career pathways through the learning of the Program.
v. Have realistic expectations, but encourage progress within K-12 career and technical education.
vi. Assist Center staff in evaluating success at the end of each school year and establishing future targets and/or benchmarks for each new year.
vii. Assist Center staff with identifying future equipment and curriculum needs as well as identifying any underused or obsolete equipment that might be better used elsewhere.

2025-26

The expansion of VEX robotics programming will be explored to include non-participating or under-participating schools in Whitehall's program housed at the Center and a report will be provided.

2026-27

By the end of SY 2026-27, the school district will develop multiple "Project-Based Learning" opportunities for excelling students who are juniors and seniors within the Program. These opportunities are to be geared to work directly with industry partners, provide a realistic challenge that can allow a high school student(s) to develop a solution for the industry partner through the Program.

Sustainability:

To all extent possible, The District is committed to ensuring the continued operation of the Emerging Technology Education Center deep into the future. Unlike so many in this country, the Whitehall School District has never wavered in its support for and desire to offer meaningful career and technical education opportunities. While many were reducing or eliminating programs, the District invested all that it could in its program. The community both expects and supports these endeavors as well. In fact, a special annual meeting vote approved the purchase and renovation of the space that will house this program. This is a $2 million investment made during very difficult and challenging times both financially and politically. Specifically, the District will provide necessary consumable supplies and materials as well regular and normal maintenance of all equipment within this facility. While we would thoroughly enjoy being able to honestly say that we will be able to replace any equipment that becomes unfixable or obsolete, we simply cannot given the honest realities of modern public education. We will however commit to doing all that we can to ensure a modern and cutting edge environment for the children of our region's future. Simply, we will do all that we can, but we may need help for large scale costs and will openly communicate any needs well in advance to existing and prospective partners as well as the advisory board.

Advisory Board:

The District will create a “Program Advisory Board” no later than the end of the 2024-25 school year as referenced in the benchmarks. However, the true target will be to create this Board of 13 - 17 members during SY 2023-24 so that we are fully operational for 2024-25 when the Center officially begins operation. The membership will be made up of regional employers specifically including, but not limited to, Ashley Furniture, WTC, CVTC, LabMidwest, at least one educator from another TVC 2.0 school district and Whitehall School District representatives both on and off staff.