

Volume 63 • No. 1 • Fall 2023

Journal of the WTEA

e Future



the

SPECIAL FEATURE:

Aviation Education - Teacher Retreat

Other Highlights: ·Solar Car Challenge ·Cardinal Manufacturing: Student-Run Business





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TABLE OF CONTENTS

Feature Article

14 Summer Aviation Retreat

Educators enjoy behindthe-scenes experience



Other Highlights

12 Solar Car Challenge

Watertown HS Competes at Nationals



17 Cardinal Manufacturing

Student-run business at Mayville HS



- 2 WTEA Board of Directors
- 3 President & President-Elect Messages
- 4 Executive Director's Message
- 5 New WI SkillsUSA Director
- 7 Officer & Award Nominations
- 8 Energy Careers Workshops
- 9 HVAC Careers & Punta Cana?
- 10 State Conference 2024 Preview
- 11 School Subscription Renewal
- 12 Solar Car Challenge
- 13 WATDA Summer Teacher Institute
- 14 Aviation Summer Teacher Retreat
- 17 Cardinal Manufacturing
- 18 Wisconsin Building Trades Council
- 19 New WI SkillsUSA President
- 20 Changing Labs With the Times
- 22 NEWMA Get Real Event
- 23 SkillsUSA Calendar
- 24 WTEA Scholarship Recipient
- 25 Directors' Reports
- 26 Explain, Exploit, Explore, Execute
- 28 Sponsors Supporting the WTEA



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PRESIDENT'S MESSAGE New School Year and What Lies Ahead!

By Doug Dimmer, WTEA President

Well, here we go again! I hope you all had a great, relaxing, wild (insert the adjective of your own that best fits) summer and are ready for the new school year in some way, shape, or form. My summer was a mix of moving my parents of 50-plus years of marriage from a three-bedroom ranch into a one-bedroom apartment; redoing the fence around my yard; and spending the rest of the time chilling out with my wife and adult kids.

It always seems like the time just flies...thinking, "what just happened to the summer?" But honestly, I am looking forward to a new school year and what is happening around the state. We have a new director at DPI, Jake Mihm, who is a former Tech Ed teacher and will guide us through a new set of standards. We have a new WTEA online registration service which will help provide a better understanding of your membership, and we will also be transitioning new board members and executive board



members into positions to keep maintaining

a quality program within the state. Of course, the thing I look forward to the most is attending our WTEA Annual Conference in March, which never seems to fail at promoting new ideas, processes, and programs.

So, I will keep this short (had a manifesto written to start, but thank goodness I changed my mind). I want to thank the WTEA Board present and past, all the teachers I have had the chance to work with, and all of you, the state of Wisconsin's Technical Education Association teachers, who put your heart and sole into making Wisconsin a leader among states in regards to technical education. Keep up the incredible work that you do and remember to bring the ideas that have helped you be successful to our annual conference. Enjoy the opportunities which are ahead and what is happening throughout the state.

Good Luck and Prost!

PRESIDENT-ELECT'S MESSAGE How to Break Out of A Rut

By Mike Paquette, WTEA President-Elect

Wow What a summer! My kids have grown up in the last couple of years and are now 14 and 16. My lovely wife, also a teacher, and I celebrated 20 years of marriage. I have been teaching for 21 years. It is a blur. I tried to take time to slow down and enjoy family this summer, get some projects done, and learn something new. Honestly, I did not do everything that I wished to accomplish.

So, let's talk about failure. I often feel like a failure, I make mistakes, I bite off bigger projects than I can chew, I accidentally misspeak with a colleague. These are just a few things I have thought of lately that I feel like I have failed at.

But Mike, why talk about failure? Well first off, I was reminded of all my failures this weekend when I, being the avid NPR listener I am, tuned in to "Hidden Brain" and caught the episode titled, "How to Break out of a Rut" https://hiddenbrain.org/podcast/you-2-0-how-to-breakout-of-a-rut/. It got me thinking, how do I break out of a rut? How can I help students be more resilient? Or, how can I help students break out of a rut? Do I have answers? No, but I have ideas.

So let's start with the first problem, How do I break out of a rut? Well, I generally do a couple of things. One, I get mad. Yes, I lose my cool, maybe not openly but I do. I get mad at myself for letting something happen, I get mad at others for not clueing me in, I get mad at my kids for not being better. Yes I just get mad. Terrible, right? So, the next thing I do is bury myself

in work in an attempt to cool off and think things through. Sometimes the thinking takes days. Often I clean, because that just helps to put things in order. Then what? What is the next step? For me I try to make one simple change. I listen to what others tell me, I take the gift, and focus on one small thing I can affect.

So why do teachers need to be so aware of ruts? To answer this, let me speak for myself personally. Over the years I have created classroom systems that are both beneficial and destructive. Sometimes I realize the issue, sometimes, I do not. So, every year I try to take some time and implement one new thing. This thing may work, it may fail. I have organized storage rooms, only to rip them apart because they did not work as intended. Discipline practices don't work. New projects crash. I had to make a change, I had to fix the rut, I had to take good advice and not take it personally. This is always hard. But trying that one new thing every year, whether it fails or succeeds, is the first step in achieving mastery. This is where I try to look at things from Thomas Edison's point of view; "I have not failed. I've just found 10,000 ways that won't work." Finally, with the school year upon us I want to inspire you the way Miss Frizzle did for so many, "Take chances, make mistakes, get messy!" That's the only way we get better!

EXECUTIVE DIRECTOR'S MESSAGE **Summer Updates**

By Joe Ciontea, WTEA Executive Director

As I write this, I'm looking out the window, enjoying a beautiful day in northern Wisconsin and reminiscing about summer. By the time you read it you will be back in the classroom, busy with safety training and preparing students for all the exciting things they will be doing in class this fall.

I had a great summer. We adopted a puppy, Bailey, in June. In addition to puppy training, fishing, reading, working on projects around the house, and traveling to concerts, Jaye and I rode the Harley to Milwaukee in July and participated in the Harley Davidson 120th celebration. It was a memorable weekend with concerts, dealer events, and the

Thunder Parade - we even bumped into WTEA Past-President, Greg Groom, and our Webmaster, Mike Beranek.

I was also busy with association business; the WTEA member data has been formatted and uploaded into the Wild Apricot membership portal, now part of our website. You can login and update your contact information at any time. If Bailey Ciontea using a credit card you can pay member-



ship dues and registration fees directly through the WTEA eStore. We will still accept checks and purchase orders by U.S. Mail or email. If you need help accessing our website just reach out to any Board member.

Our summer teacher retreat was in the Fox Valley in June - be sure to check out the article on page 14. The attendees learned a lot about aviation technology.

In July, I attended the WATDA summer teacher workshop at the new CVTC Transportation Education Center in Eau Claire. I was there to provide WTEA updates and



Joe and Jaye Ciontea at and WTEA. the Harley Celebration

promote memberships. Much to my surprise, I was presented with the WATDA Lifetime Achievement Award. My good friend and colleague, Bryan Albrecht, was there to participate in the presentation. I am both humbled and honored to receive the recognition for my time spent working with both the WATDA

Welcome Jake Mihm! Jake was hired by DPI to serve

as the Technology Education Consultant and SkillsUSA State Director. Jake has been a WTEA member for most of his 25-plus years in education. He has been a conference presenter and a member of the Board of Directors. I look forward to working with him. I'm confident he will repre-

sent our profession well. Have a great fall term!





Mark Your Calendar

WTEA Awards Nominations Deadline Nov. 15, 2023via the WTEA website

ACTE CareerTech VISION 2023 Nov. 29-Dec 2. 2023Phoenix. AZ

State Conference-Presenters Deadline Dec. 1, 2023 via the WTEA website

WTEA Officer Nominations Deadline Dec. 8, 2023to Mike Paquette

Articles Due for Winter Interface Dec. 15, 2023to Duane Apel

WTEA Early-Bird Registration Deadline Dec. 20, 2023 WTEA website or U.S. Mail

WTEA 55th Annual State Conference March 6-8, 2024..... Wis. Dells, WI

ITEEA National Conference March 6-9, 2024..... Memphis, TN

SkillsUSA 51st State Conference April 9-10, 2024Madison, WI

SkillsUSA National Conference June 24-28, 2024Atlanta, GA



Joe receives the WATDA Lifetime Achievement Award from Brent Kindred



Joe and former WTEA President, Greg Groom

NEW LEADERSHIP AT THE STATE LEVEL

DPI Names Jake Mihm As Technology & Engineering Consultant and SkillsUSA Director for Wisconsin

Sara Baird, Assistant Director for Career & Technical Education at the DPI in Madison, shared a welcome message and brief bio (below) about Jake Mihm. "We are excited to share that DPI has hired a new Technology and Engineering Education Consultant and Wisconsin SkillsUSA State Director! Please help us welcome Jake Mihm to his new position! Jake began in his new role on Monday, August 14th. Here is a little bit about Jake:"



Jake Mihm

I am a proud Wisconsinite. Born in Milwaukee, raised in Plover, I attended UW-Stout, and have been teaching Technology and Engineering for the last 25

Career & Technical Education

years. I have experience in

teaching courses which primarily focused on manufacturing, construction, and engineering pathways.

I have a passion for Technology and Engineering that extends beyond the classroom and believe that opportunities within business, industry, SkillsUSA, youth apprenticeships, as well as preparedness for college and career planning are important components to our students' success. I am an outdoor enthusiast who enjoys a multitude of activities which include fishing, foraging,

a variety of hunting, golfing, hiking, boating, and skiing throughout the seasons in Wisconsin. I am

honored to represent our great State of Wisconsin as the Technology and Engineering Consultant and SkillsUSA Skills Director!



three very different school districts over my tenure

		51	
Last Name	First Name		
Home Phone ()	Local Tech College District	# years teaching	
School Dist.	School Name		
School Address			
School City	State Zip E-mail:		
Check appropriate boxes below &	total amount due. (To pay fees with a credit card go	o to the WTEA website)	
Membership Fees: [] 3 year mer	mbership - \$90.00 [] 1 year membership - \$35.0	0 \$	
Spring Conference EARLY BIRD R	Registration (Must be postmarked by December 20,	2023)	
[] \$145 members	[] \$180 non-members	\$	
Spring Conference Registration (A	After Postmarked date of December 20 , 2023):		
[] \$165 members	[] \$200 non-members	\$	
WTEA Awards Banquet - Wed. Mar	r. 6th (<i>Tickets must be purchased in advance</i>): []\$3	\$	
[] Bill my school district - purchase	e order is attached []Payment enclosed	Total \$	
Send completed form with paymer	nt or school purchase order to: WTEA, P.O. Box 531, Rhi	nelander, WI 54501-0531	
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*Room reserva	tion: DEADLINE FOR CONFERENCE RATES - 2/2	20/2024	
Room Rates: Tower Jr. S	Suite - \$149 • Two-bedroom Condo - \$229 • Three-bedroo	om Condo - \$399	
Toll Free Dedicated # for reserva	ations 1-833-621-4953 • WI Technology Education 202	4 Booking ID# J28197	
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PHILLIP PAPADANTONAKIS | PPAPADANTONAKIS@H2IGROUP.COM | 773.720.4359

Contact Phillip Papadantonakis, H2I Group Service and Applications Engineer, with any questions, or to get support or schedule service on H2I Group equipment. Are you new to teaching or at a new school this year? Phillip can also assist with onsite training on H2I Group equipment you may not be familiar with!

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NOMINATIONS: WTEA Officers & Awards

Be Part of the WTEA Team

We are currently accepting nominations for the office of WTEA Vice-President. This is your opportunity to serve your profession in a leadership position. The WTEA Board of Directors works together as a team to plan and coordinate professional development activities, give association awards and promote the advancement of our profession. The Board meets up to four times per year; meetings are held both face to face and virtually, as appropriate. If you have questions please contact any member of the WTEA Board of Directors.



Vice-President

(2 year term): Spring 2024 - Spring 2026

Send nominations to WTEA President-Elect Mike Paquette: mhscte@gmail.com Nominations accepted until December 8, 2023

*Ballots will be mailed to members approximately February 1st. If candidates run unopposed, a unanimous ballot is cast by the Board and no paper ballots are mailed.

WTEA Awards Nominations Needed



Each spring at our annual awards banquet, held at the WTEA Spring Conference, the WTEA recognizes technology educators, industry, and technology education programs that have demonstrated outstanding achievement. The WTEA needs your help as educators to identify these worthy teachers, programs, and other professions that deserve recognition. The WTEA is looking for educators that are going above and beyond in their classroom. The WTEA has a variety of award categories that cover teachers, programs, and examples of classroom excellence. For the criteria for each award, members are encouraged to visit the WTEA's awards page on the website.

As a profession we need to continue to recognize greatness in our profession! The WTEA Awards Banquet gives us that opportunity. The awards committee will contact the nominee and request information regarding the nominee's curriculum, achievements, and contributions to Technology Education, along with letters of endorsement.

To nominate a teacher, program, or industry, visit the awards tab on WTEA website at wtea-wis.org. All nominations must be submitted via the WTEA website. The awards ceremony will be held Wednesday, March 6th, at the Chula Vista Resort as part of our 55th annual Conference.

Notes:

- Nominations must be received by November 15th to be considered for recognition the following spring.
- Technology Educators must be a member of the WTEA to be considered for award recognition, unless the award being nominated is "Special Recognition."
- For a detailed description of the awards please visit our website or contact any member of the Board.
- QUESTIONS? Pease feel free to contact me at this email address: awards1@wteafoundation.org



WTEA AWARDS Technology Educator of the Year M.S. Program of the Year H.S. Program of the Year Award of Excellence Inspire Award Special Recognition Award Community Service Award

DIRECTOR'S REPORT

Inspire Your Students' Futures With "Focus On Energy" Career Exploration Workshops



By Eric Sutkay, District F Director

This is a great time to start planning for the upcoming semester. Aside from the planning and prep of what am I going to teach today, you might ask yourself, "How can my students benefit from hearing the same message from

a different source?" This is that exact opportunity! This is a great day for you, the Tech Ed teacher. Focus on Energy will do all of the leg work. All you need to do is provide the space and a day. This is a great opportunity for you to expose your students to different careers first hand!

Demand for a new gen-¹ eration of skilled HVAC and

Students listen to presenters at Career Exploration Workshop.

solar technicians keeps growing exponentially because of Wisconsin's demand for energy-efficient and renewable energy solutions. Focus on Energy's Career Exploration Workshops provide students with an inside look at these rewarding career opportunities by connecting educators with a network of more than 900 experienced Focus on Energy



THERE IS A TABLE SAW ACCIDENT EVERY 9 MINUTES IN THE United States. What if the next one is in Your Shop? Protect Yourself Today.



Trade Ally contractors. Developed with input from technology education teachers and industry professionals, these hands-on workshops inspire students to explore their future in a fast-growing industry.

Workshop presentations are typically 45 minutes long and offer students an inside look at a career in these trades, including: on-the-job training, compensation and benefits, paths to employment, the typical "day on the job," and career advancement opportunities.

HVAC Career Exploration Workshop

HVAC technicians work to repair, install, and maintain heating, ventilation, and air conditioning systems. Every day is different. They get to work in an outside of the office environment, build skills, and learn about innovative energy-efficient technologies.

Solar Career Exploration Workshop

Solar photovoltaic installers are essential to solar array assembly, installation, and maintenance. This exciting career offers plenty of opportunities in an industry that is expected to grow exponentially and can provide the financial freedom to enjoy life while also saving for the future.

Workshops in Action

Want to see what a Career Exploration Workshop would look like in your classroom? Focus on Energy recently partnered with



Students learn about careers in the HVAC field.

an HVAC Trade Ally contractor to develop an example video, which explains how easy it is to host a workshop, and the benefits for your students. Visit **focusonenergy.com/career-resources** to watch the video and check out resources available to you.

Interested in Hosting a Workshop?

Contact Karl Hilker, Senior Market Outreach Mgr., at karl.hilker@focusonenergy.com to get started.

Follow the WTEA on Facebook & connect with colleagues from across the state!

Fall 2023 | 9

DIRECTOR'S REPORT What Does Punta Cana and Our HVAC Industry Have in Common?

By Anna Vitale, WTEA Vice-President, TE Instructor - Dodgeland HS

What a great summer! I hope everyone was able to relax and rejuvenate for the coming school year! Going with that theme of relaxation, this is an informal, conversational type of article.

Every August, I take my daughter to Punta Cana in the Dominican Republic. We go to the same resort we've been

going to for many years. Each time I am there, I observe what the 'invisible' staff is doing: the landscapers, custodial staff, tile repairmen, VAC (I doubt they are called HVAC - no need for heat down there) technicians, etc. I'm always amazed at the culture of hard work that I see day in and day out, no matter how blazing hot the sun is. And, I love seeing the big green John Deere tractor that cleans the seaweed off the beach!

One day, the VAC went out in my nephew's hotel room. I stopped by and talked with the VAC 'kid.' Because, 'kid' he certainly looked. Couldn't have been more than 22 yearsold. He said it wasn't a big problem, it happens all the time, he knew exactly how to fix it. As I walked away, I wondered if he realizes how valuable his skills are in the U.S., just as much as in the D.R.? Solid work ethic, cheerful attitude, all that! Then, I wondered what the income difference was. (*Please note: this is not a scientific research on this topic, merely for curiosity purposes*):

HVAC TECH:	2-5 Yrs	5-10 Yrs
ANNUAL INCOME	Experience	Experience
Dominican	~67,800 DO pesos/	108,340 DO pesos/
Republic (DOP)	\$1,194.71 USD	\$1,909.07 USD
United States (USD)	~\$55,385 USD/ 3,143,098.02 DO Pesos	\$77,500 USD/ 4,398,125.09 DO pesos

https://worldsalaries.com/average-hvac-technician-salary-in-dominican-republic/

https://www.talent.com/salary?job=hvac+technician&location=wisconsin#:~:text=The%20average%20 hvac%20technician%20salary%20in%20Wisconsin%20is%20%2455%2C385%20per,up%20to%20 %2477%2C500%20per%20year.

According to https://teleport.org/cities/santo-domingo/ salaries/ a waiter in the D.R. makes \$2,456 USD annually. The average annual living wage in the D.R. is 222,042 DOP (\$3,912.63 in USD). If I'm interpreting these numbers correctly, that young man would do very well if he were to bring his HVAC talent and skills here to the U.S. where we are struggling to get enough young people to pursue valuable skilled trade occupations.

All of this leads me to share with you an incredible opportunity that was made possible for my students last spring! I was fortunate to get connected with Jon Hirsch from Auer Steel and Heating Supply Co. last spring. Soon afterwards, the smiling, welcoming faces of he and his co-presenters, Chad Guse and Keith O'Brien, arrived one day and guided my students through something they never expected or experienced before - an amazing hands-on experience of soldering copper pipe, bending pipe, and an introduction into the industry! This was truly an eye-opener for many

of them! Students who had been sluggish to show interest in the skilled trades were now actively engaged in the whole event. A student who had been a behavior challenge ended up being the most enthralled and productive.

I was also very grateful to Jon and his team for talking to the students about what is needed in today's workforce - those 'soft skills' that many students shrug off as unim-

portant. I had this strange feeling of relief that the students were hearing this from others, people in the world of work who possess value and authority, and they were actually listening to what they were saying! They talked about the diverse jobs available in the industry, job security, income potential, where to get an education and how to connect with Mr. Guse, one of the presenters and local HVAC owner, for job shadowing. Through it all, they reinforced the necessity of a solid work ethic, being a hard-worker and coming to the profession with a positive, can-do/will-do attitude. I appreciated how the team talked about the tools, the various skill levels, and the value of continued learning throughout one's career to increase your skills and abilities. They gave personal stories of their own life paths and experiences.

To top it off, Jon and his team shared the instructions for the copper assembly. I haven't soldered copper in years, so this refresher was very valuable to me. Heck. If I weren't so old, I'd go into the HVAC industry. Then, perhaps... go work in my favorite tropical paradise...Punta Cana... yeah...the palm trees...the sound of the ocean...sigh...

If you're looking for an outstanding, hands-on experience for your students, Auer Steel and Heating is definitely your go-to! (They have multiple locations.) You can see more photos on the WTEA Facebook page.









55th Annual Technology Education Conference & Trade Show

Tentative Conference Overview

Wednesday, March 6, 2024

5:30 p.m. – 8:30 p.m. Conference Pre-registration 6:45 p.m. – 9:00 p.m. Awards Banquet

Thursday, March 7, 2024

7:30 a.m. – 3:00 p.m. Conference Registration 7:00 a.m. – 9:00 a.m. Project Showcase setup 8:00 a.m. - 4:00 p.m. Trade Show 9:00 a.m. – 3:30 p.m. Project Showcase 8:55 a.m. – 9:05 a.m. General Welcome 9:05 a.m. – 10:00 a.m. 1st General Session 10:15 a.m. – 3:30 p.m. Concurrent Sessions



Thursday Keynote Speaker:

Matt J. Simpson Senior Project Engineer Trane

Thursday, March 7, 2024 7:00 p.m. – 9:00 p.m. President's Reception Friday, March 8, 2024 7:30 a.m. – 11:30 a.m. Conference Registration 6:45 a.m. - 7:45 a.m. WTEA Breakfast 7:45 a.m. – 8:30 a.m. WTEA Membership Meetina 8:45 a.m. - 12:15 p.m. Concurrent Sessions, **Demonstrations & Project Showcase** 12:30 p.m. - 2:00 p.m. 2nd General Session & Luncheon 2:15 p.m. - 3:30 p.m. WTEA Board Meeting



Friday Keynote Speaker:

Katherine P. Frank Chancellor University of Wisconsin-Stout

Session Topics Include: PLTW Roundtable - Problems & Solutions, Solar PV Training, Video Creation on YouTube, Working Through a Referendum, Fab Labs in Education, Pathways and ACP, Energy Debate, WTEA Student Ambassador Program, Automotive Curriculum, Epoxy Projects, VCarve/Aspire software, Off-Site Building Construction, FANUC Robotics Certification, Lost Foam Casting, Retirement Basics for New Teachers, New Welding Projects, Building High Mileage Vehicles, Project Showcase, SkillsUSA, Middle School Roundtable, New Teacher Boot Camp, and much more!







Chula Vista Resort



4031 River Road, Wisconsin Dells www.chulavistaresort.com

Toll Free Dedicated # for reservations 1-833-621-4953

*Ask for WTEA Conference Rate! See page 5 for details.

SUBSCRIPTION

Renew Your *Interface* School Subscription

The WTEA school (building or dis-WIEA school (building of us-trict) subscription provides you and your local colleagues with an opportunity to keep informed about technology education in Wisconsin. The more local technology educators you sign up, the more you save. An individual subscription is \$35 per year, but you can sign up 3 or more staff members and receive a discounted rate. Each person receives: a personal copy of the Interface, all association mailings and notices, invitations to attend regional technology education meetings and workshops, access to the secure file area of the WTEA website, discounted admission to the association's annual technology education conference, and eligibility to receive all association awards (Educator of the Year, Program of the Year, Award of Excellence, 25-Year Award). All mailings will be sent to the work address. The school subscription will expire the following fall. See fee schedule (below).

How to sign up:

Create a list of everyone you want to include in your group subscription and include the name, email, school name, and work mailing address for each person. Mail the list along with a check or school purchase order to: WTEA, PO Box 531, Rhinelander, WI 54501-0531

Want to pay by credit card? Send an email with everyone's contact information and request a payment link. Emails should be sent to Executive Director Joe Ciontea at jc.wtea@gmail.com.

To be eligible for all benefits of this special pricing, school subscriptions should be sent as soon as possible. Please note: The *Interface* is published 3 times per year: fall, winter and spring. Electronic copies are also posted in the secure file area of the WTEA website.

*Group discount fee schedule:

1st person \$35, 2nd person \$30, 3rd person \$25. 4th person and beyond are \$20 each.

Not sure if your membership is expiring? Use the WTEA "Member Log-in" on our website to check your membership status (no longer displayed on the mailing label). Then select "Edit / Profile" to update your WTEA contact information. Be sure to click "Save" at the bottom!

DESIGN CONTEST Students: Design Our Next Cover!

INTERFOGE

Cover Design Confeet ATTN: Tech Ed instructors! - WE NEED YOUR HELP -

What: Interface Magazine cover design contest for your students (or TE instructors).

Why: To capitalize on the outstanding abilities of TE students statewide AND provide them with great real-world design experience!

When: Designs DUE in early January 2024 with winning design to be used beginning with 2024 spring *Interface* issue.

How: Email *Interface* editor, Duane Apel, at interface.wtea@gmail.com for specific criteria,magazine spec's, & exact dates.

Award: Certificate of achievement for winner & name & photo included in magazine.

Theme: The WTEA theme (to be used on the cover) will be determined by Nov. 1st



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SOLAR CAR CHALLENGE

Watertown High School Competes Successfully In Its First Year

By Jesse Domer - WTEA Board Member and TE Instructor, Watertown High School

This past school year (2022-23), Watertown High School students designed, built, and competed with, a solar car! This was just like the college teams do (only slower, and heavier). It had always been a "bucket list item" for my career to some day build a car like the college teams - done! In August of 2022, our team made the decision to build our first solar car to compete cross-country from Texas to California.

That was the easy part. From there we dove head first

into the project that sucked our year away quickly. We elected five student leaders to help lead the team forward. Our crew chief was senior Devin Mc-Guire, our Build Team Lead was sophomore Brayden Haversack, our Design

Team Lead was senior James Walker, our Electrical Team Lead was sophomore Will Wrolstad, and our Marketing Team Lead was Becca Leis. Each of these teams consisted of 4-8 students helping to complete the tasks for the year.

In September/October we constructed a prototype chassis out of PVC tubing and cardboard. From there we ordered our aluminum tubing for the chassis and began construction. We set a goal of having the car rolling by January 1st and we hit that goal (within 1 day)! In January, I took the leads to Dallas, Texas, for the Winter Teams Workshop where we learned a lot more to bring back to our program. Spring led to struggle after struggle with lots of (rushed) things needing to be built twice due to simple mistakes along the way.

The car chassis is aluminum one-inch tubing, tig welded. Front wheels are recumbent bike wheels and the rear is a motorcycle front wheel. There are six flexible solar



Solar Car Pre-Race Inspections

panels on the roof of the car producing over 1,700 watts of power in peak sun. The storage battery was built by the students from 480 lithium, 18,650 panasonic cells, totaling around 5.2kW of energy. They installed a 3kW electric motor to drive the car. It was steered with a standard steering wheel and rack and pinion linkage. The car had four custom snowmobile shocks in it for suspension. In total, the car weighed 700 lbs.

We were able to drive the car about 50 miles in Wa-

"It had always been a 'bucket list item' for my career to some day build a car like the college teams..."

tertown before we loaded it up for Texas! The two-week trip to Texas began in Dallas with three days of inspections. On top of the stress of the event, the southern U.S. was under a heat advisory the entire trip

with 100-plus degrees temperatures every day. We passed inspections (with a few hiccups) and made it to our first race day. Day one started with rain which only lasted about an hour and we then took off. We made it 90 miles that day



(of 200 allotted). Day one ended in Snyder, Texas. Day two we started with only 20% battery because the solar charger was not working on day one (we later found out) - but were still able to travel 50 miles

3rd Place - Advanced Division Trophy Winners

on the road while getting the battery back to 100% by the end of the day in Carlsbad, New Mexico. Day 3 was amazing! We had 100 miles allotted, and the team decided to trailer 10 miles of that due to big hills/mountains. They worked together all day and got the 90 miles they planned to get and finished with 80% battery in El Paso, Texas.

It was a HUGE WIN for the team! We were in the "Advanced" division, which allowed for lithium batteries, along with three other teams from across the U.S. We placed third in that division with 250 total miles traveled.

Unfortunately, day three ended with an emergency advisor meeting held by the event staff informing us they had to cancel the rest of the event due to 50% of the staff get-

Continued on page 23...

TEACHER TRAINING INSTITUTE WATDA Foundation Helps Teachers Stay Current In A Rapidly Changing Industry

By Brent Kindred, Vice-President - WATDA Foundation

On July 11 – 12, 2023, approximately 60 teachers converged at the Chippewa Valley Technical College



(CVTC) transportation center in Eau Claire. This is a \$30 million dollar referendum-funded, stateof-the-art transportation center that houses programs in automotive, collision, diesel, and power equipment. Great facility and great partners for this event.

Holding transportation professional development events like the Summer Teachers' Institute is one of the most important activities the Foundation does. The purpose for all our training sessions (WTEA Spring Conference & Summer Institute) is to help our teachers and programs stay current with a rapidly changing industry. The Foun-

dation wants to help our teachers to be better and for our transportation programs to thrive.

Over the two full days of training, teachers participated in sessions that included electric and hybrid vehicle safety, small engines dyno demonstration, diesel engine identification, and Toyota specific training. In total, teachers attended six robust training sessions and took a field trip to Mars Racing. The Mars Racing tour provided an in-depth, behind the scenes look at building race chassis, engines, shocks and much more. In total, teachers received automotive, collision, diesel, Toyota, and small engine training.

Another highlight from this training was a female student technician panel discussion. This panel involved two collision students who just graduated from high school and the other just completed her first year in the automotive program at Waukesha County Technical College. The panel was moderated by Ms. Tara Topel of Topel's Automotive Repair. She is the 2021 Women in Auto Care Female Shop Owner of the Year award winner. Great discussion for everyone to hear and ask questions. Great group of panelists who are our future technicians.

Training sessions like this would not be possible without our industry partners. CVTC graciously opened their doors, hosted sessions, and allowed us to fill up their training center with teachers from across the state. We also had many generous donors contribute to this event, which allows us to offer it to teachers free of charge. We simply want to have our teachers attend.



AVIATION EDUCATION TEACHER RETREAT Educators Enjoy Behind-the-Scenes Experience of Aviation Technology and Careers

By Steve Meyer, Manager of STEM Education, Fox Valley Technical College

On June 14th, approximately 30 educators came together for a jam-packed day of fun and learning centered around aviation and aviation manufacturing careers. This

event was put on through the WTEA and the Northeast Wisconsin Manufacturing Alliance (NEWMA), with help from Fox Valley Technical College, the Experimental Aviation Association (EAA) Youth Education Center, Gulfstream, and Plexus. The goal of the event was to give teachers a better understanding of science, technology, engineering, and mathematics, along with careers and learning opportunities associated with the aviation industry.

The event began with a tour of the EAA Museum, a presentation, and demonstrations by the staff at the EAA Youth Education Center. Participants learned about different aviation youth activities, the history of aviation, and all the opportunities available through the education center for their students and schools. The participants were able to get experience in real-life flight simulators and were also able to go up in the Wittman Regional Airport control tower.

The EAA Youth Education Center in Oshkosh is an unbelievable resource for our local schools and teachers. They host school tours, student projects and camps, and provide aviation curriculum. The center is staffed by professional educators with lots of teaching experience. A special thank you to their staff. They were so professional and welcoming. Be sure to contact them and look into all the learning opportunities for you and your students. Expect some breakout sessions on their programming at our future WTEA annual conferences.

The afternoon started with a tour of Gulfstream Aerospace Corporation, designers and builders of world-class



View from the control tower at Wittman Regional Airport in Oshkosh.

"The day was outstanding, touring the museum, flying the Cessna 172 simulators, and being in the most known control tower in the world...Then to tour Gulfstream with multi-million dollar private jets...etc., who wouldn't enjoy the day? - Duane Elfering, UW-Platteville

business jet aircraft. This VIP tour took teachers behind the scenes and through the design process of the build-out of the inside of multi-million dollar luxury jets. The engi-

neering design process was front and center in this tour as the engineers and technicians were designing and fabricating custom seats, cabinetry, and extremely sophisticated electrical systems for the world class jets. The cost, accuracy, use of different materials, and attention to detail were all appreciated by the tour participants. In fact, many of the shops at Gulfstream looked like labs in our Wisconsin schools. A special thanks to

the employees at Gulfstream for allowing us to tour their amazing company.

After the Gulfstream tour, educators went across the street and toured Plexus. Plexus is a global leader in complex product design, supply chain, and manufacturing services associated with the electronics manufacturing industry, including the aviation sector. Representatives from



WTEA members view the various aircraft on display.

the Appleton division showed how Plexus creates efficient manufacturing solutions for products such as robotic rovers, high-tech automated beverage dispensers, and power generation technologies. Like the other companies, the leaders at Plexus reinforced the need for their employees to have a continuous improvement mindset, think beyond the obvious, adapt to change, and work well in teams just like technology and engineering teachers instill in their students every day. The Plexus tour really opened everyone's eyes on how systems are designed that allow complex technologies to be designed and produced.

Continued on next page...

... Continued from page 14

The event concluded with an evening social for the teachers and organization leaders to network and discuss future business/education partnerships. The entire event was an absolute blast. The teachers had a great time and learned a lot. A special thanks goes out to the above organizations, along with Ann Franz, Northeast Wisconsin Manufacturing Alliance (NEWMA), for helping coordinate and fund the event. The WTEA will be doing more STEM related retreats in the future.

Testimonials From Participants

"The opportunities for students and potential employees never cease to amaze me. The aviation event exposed me to the educational partnership opportunities at EAA and the skills I need to teach my students to be successful in the aviation and manufacturing industries. I enter this school year inspired to teach employability skills and use aviation as a way to teach Next Generation Science Standards. Thanks to the EAA Youth Education Center, NEWMA, the WTEA, FVTC, Gulfstream, and Plexus for this amazing and valuable experience!" --Matt Van Thiel, Middle School Teacher – Little Chute

"I'm excited that we were able to host our annual Tech Ed teacher retreat after a hiatus due to the pandemic.

Over the years we have had retreats focused on boats, tow trucks, to now aviation. It is exciting to bring Tech Ed teachers from throughout the state together to learn and have fun!"

--Ann Franz, Executive Director, Northeast Wisconsin Manufacturing Alliance



WTEA members get an in-depth tour of the EAA Museum.



Oshkosh EAA Museum Exhibit



EAA Youth Education Center



Angie Arneson (Seymour Schools) in the Redbird flight simulator.



Aviation retreat participants head toward the traffic control tower at Oshkosh's Wittman Regional Airport.

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STUDENT-RUN BUSINESS Cardinal Manufacturing Continues Its Success Story

Cardinal Manufacturing began in the Eleva-Strum School District during the 2007-2008 academic year when instructor, Craig Cegielski, approached the School Board



about the potential of pursuing an in-school manufacturing business similar to one he started in his prior position in the school district of Antigo, Wisconsin. The school board approved and since that time Cardinal Manufacturing has gone from its infant stages to a company with significant annual sales and national notoriety.

Craig Cegielski

What Is A Student Run Business?

A student-run business is exactly what it sounds like. It is a business that is primarily run by students for highschool credit and often for a paycheck of some kind. Students need to apply and interview for a range of positions within the company and acceptance into the program. The program is managed by an instructor, or team of instructors, and takes place at school during the regular school day. The student-run business has real products or services, real employees, real customers, real money, real deadlines, real challenges, and real learning opportunities.

Cegielski shared these thoughts: "I have been very fortunate to grow a student-run business model into one which can be replicated in any school, in any location, with determination and the right partners....this is the business and program my team and I have built with the help of many partners, students, the community, and our local school district. Any activity that can make the material more engaging and relevant to students' everyday life and their future is a big plus. A student-run business provides the most realistic risk and reward experiences for students while still taking place in a classroom environment."

Cegielski's team has had the opportunity to host many schools over the years and develop workshops and indepth training tools and resources that are provided free or at very low cost, thanks to generous donors.

For more information on live workshops, guidebooks, class outlines, step-by-step instructions, and low cost and free resources please visit: www.StudentRunBusiness.com.





Cardinal Manufacturing hosted their annual Open House on May 3rd. There were raffles, food, and special guest, Chris Kroeze, (runner-up on the TV show, *The Voice*). Several sponsors made it all possible.

Cardinal

Manufacturing

WISCONSIN BUILDING TRADES COUNCIL Free Materials, School Visits and Fall Workshops Available

The Wisconsin Building Trades Council acts as a unifying voice for Wisconsin's 40,000 union construction workers and their many craft trade organizations. As an advocate for hands-on learning and practical skill development, we are committed to strengthening the relationships between our skilled trades and educators like you.

Our state-of-the-art registered apprenticeships offer a solid pathway to meaningful careers in the construction industry. These trades encompass a diverse range of professions, including carpentry, plumbing, electrical work, masonry, welding, and more. In addition to incurring zero student debt, our apprentices "earn as they learn" with a paycheck from day one, as well as college credit that can be applied towards a two-year degree.

The WBTC stands ready to act as a resource for you and your students in any capacity that is helpful. We are happy to provide you with a supply of our *Getting into the Trades* Booklets, which contain an overview of each skilled trade and contact information for training centers throughout Wisconsin. If you are looking for handson or in-person opportunities, we are happy to work directly with you or your school to schedule visits, competitions, and demos in your classrooms or career fairs. To learn more about any of these opportunities or other questions you may have, please don't hesitate to reach out to WBTC Executive Director, Emily Pritzkow, by calling (608) 338-9964 or emailing emily@wisconsinbuildingtrades.org.

Finally, we hope you will join us at one of our regional Training Center Open Houses happening this September. This free catered luncheon and workshop provides the latest information on registered apprenticeships and careers across Wisconsin's building trades.



WTEA STUDENT AMBASSADOR PROGRAM

The WTEA Student Ambassador Program is kicking off its fourth official year. The program provides students with an opportunity to see what it is like to be a TE Teacher and gives students the opportunity to work with a cooperating teacher mentor. The Student Ambassador Program is an initiative started by the WTEA to help support students who show potential and/or an interest in becoming a Technology Education Teacher.

When students enroll in the program, they work with their cooperating teacher/mentor on a number of amazing opportunities. Students will plan and teach a lesson; visit colleges who support a 220 license; have the opportunity to attend the WTEA Spring Conference; and create a digital portfolio of their experience. These are a few of the many opportunities the program provides. At the end of each year the Student Ambassador Program offers scholarships to those who apply. I encourage you to reach out to your students and have a conversation about their future. Not all students are interested in becoming a TE teacher, but these conversations will shed light on why they are taking your classes and will help you better serve them.

Visit the Student Ambassador website linked to the WTEA home page. Contact Matt Schultz with any questions. wteasap@wteafoundation.org



WISCONSIN SKILLSUSA Dodgeland HS Student Elected As New State President

By Anna Vitale, WTEA Vice-President, and TE Instructor - Dodgeland High School

Danielle Casperson, a senior at Dodgeland High School, has had an intense enthusiasm for red blazers since her first days in public school as a sophomore. The red SkillsUSA blazer she proudly wears goes hand-in-



Danielle Casperson, State SkillsUSA President

hand with her determination, tenacity and drive for excellence, along with a strong belief in SkillsUSA.

Dani joined Dodgeland's SkillsUSA Chapter as a sophomore and was elected parliamentarian. Her deep conviction on how SkillsUSA helps students prepare for their futures extended to running for a state officer position in

President 2022. Last school year, Dani took on a variety of duties in the role of a State SkillsUSA Officer and Reporter. Dani is an active student, involved in many other clubs including Academic Decathlon.

"Being a state officer is exhilarating, I never thought I would end up in a place like this; I get to work with an incredible team of other driven minds to help represent and lead SkillsUSA. It's an unreal experience to be on stage in front of a hundred-plus students and have them look up to you, or to represent a state organization at various events." At the annual SkillsUSA Leadership and Skills Conference in April, Danielle was announced as the new Wisconsin SkillsUSA President. Her duties include advocating for the skilled and technical trades with industry and community partners, promoting SkillsUSA in Wisconsin schools, supporting local chapters and much more.

She is excited to begin this journey of a lifetime that will have an impact in the world of technology education

throughout Wisconsin. "Three years ago, mid-pandemic, I was home schooled and two years ago I was enrolled in public school and introduced to SkillsUSA. I have learned more about myself and being a leader than ever before because of, and through, SkillsUSA."

If you are interested in having Dani meet (virtually or in person) with your students or chapter, contact her at danielle.casperson@ dodgeland.k12.wi.us. You can also



Casperson at the State SkillsUSA Conference in Madison

follow Dani's journey as State SkillsUSA President on the Dodgeland High School SkillsUSA Facebook page.

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CHANGING LABS WITH THE TIMES

Kennedy Middle School Transforms Facilities and Curriculum

By Jeffery Thielke, Kennedy MS Instructor, Germantown

Designing & Planning Lab

For the past 12 years, there has been a transformation occurring in our facilities and curriculum; we've been implementing an equipment and software plan, and offering PLTW.

The traditional classroom with desks was converted into the "Design & Planning" lab. The desks were removed and large octagon tables were brought into the lab, chairs purchased, and a layout was established offering a flexible design

for the five different classes that utilize this facility. Walls were cleaned and painted and a blue strip added for color. A storage room was converted into an office. Bookshelves were purchased to hold portfolios for the new PLTW Design & Modeling classes. A classroom project display area was created. Additional work spaces were moved into the lab from an empty computer class. Partnerships with local businesses produced donations of file cabinets, computer chairs and motivational pictures for the lab. Additional lockers and countertops were purchased for the growing program. Promotional banners were designed and printed, and posters added to empty walls. A 25-year-old carpet was finally replaced with a durable vinyl flooring.

Today, 6th-8th grade students utilize this facility to brainstorm, design and plan both individual and team activities in all five of the Technology Engineering classes.

Computer Design Lab

The present computer design lab was an old modular furniture layout, without Mac computers. The equipment that used to be in the cubicles was either broken or missing. With the addition of PLTW Design & Modeling in this facility, new computers and software for the now Technology Engineering program were added. Old chalkboards were removed and a 10-foot projection screen was mounted on the wall. A grant allowed the purchase of a presentation sound system. As part of the PLTW start-up grant a multi-media projector and printer were purchased. All the walls were cleaned, painted and posters/ pictures added, to continue what was done in the Design & Planning Lab. Over the years, additional grants allowed the purchase of 3D printers for the lab (9), a t-shirt press, button making machine, two 3D scanners and "Mag- Lev" tracks. The 2018 school renovation replaced the old carpet and this school year a "structural analysis" machine.

Today, this facility offers students in grades 6-8 an opportunity to experience product, architectural, graphic, 3D printing-scanning, CNC molding and portfolio design.

Production Lab

This "old" wood shop took on a new name, "Production Lab." The wood storage area was converted into additional lab space. The old rusty lockers were painted and new countertops added. The equipment in this facility was from the pre-

1960's, when this building was Washington County Union H.S. Most of the equipment did not work properly, was unsafe for middle school students or had been modified for other uses. All the woodworking equipment was eventually replaced. The floors and walls were painted to continue the process of changing the working environment for students. Safety lines were established offering a visual layout and traffic flow for the students. Grants allowed for the start-up of a plastics education program with the addition of injection molding, ovens, strip heaters and vacuum forming machines. The unused finishing room was converted into project storage. The supply room was "purged" and shelving was constructed. Old air lines were

replaced with wall vacuums for all the equipment. Recently, grants offered the program a CNC milling machine for doing "mold design" fabrication. The school renovation added air conditioning and a needed electrical update. A grant from the Society of Plastics Engineers allowed the addition of an industrial production injection molding machine for the plastics manufacturing program. Continued on next page...





...Continued from page 20

Today, this facility offers students in grades 6-8 an opportunity to experience a plastics program with injection molding, thermoforming, vacuum forming, euro, plastisol, simple and powder casting, CNC mold design and machining, and production plastics machine operation. The Production Lab has seen the biggest transformation over the years.

Multi-Purpose Lab

In 1999, a new wing had just been built at Kennedy Middle School and a traditional classroom was now the Multi-Purpose Lab, but there was no equipment, tools or electrical to support this idea. This room was also not connected



to the Tech Ed Mac Computer Lab, and actually separated by another classroom. After years of having two different locations, classrooms were switched, allowing both Tech Ed rooms to be next to each other, but still not connected. This was an improvement, but certainly not ideal.

With the addition of PLTW in 2011, there needed to be improvements to the lab. The Multi-Purpose Lab became a flexible space that could be used for any class. It was primarily used for Transportation classes, but Communication also met there. Any class that was shaping materials could now use the lab because it had hand and power tools,

with a storage room for supplies. The lab became multi-use, with collapsible tables and chairs, for quick reconfiguration for other activities. A projector and screen were added, now Communications class was able to view photographs and videos.

Robotics Lab



When PLTW was adopted, the old Mac computer room was converted into the robotics lab. There are 15 workstations with desktop computers. In 2014, a plan was presented to the school board, outlining the need for windows and a door to connect the Automation & Robotics and Multi-Purpose Labs. The plan included architectural drawings, a 3D visual design and a construction cost analysis. The plan was unanimously supported and the \$20,000 job was completed in time for the start of the 2015-16 school year.

Communications Lab

In 2018, chrome books were adopted school-wide and a now empty computer lab became obsolete. Since this room was connected to the Robotics Lab and now the Multi-Purpose Lab, it became apparent that this additional lab could be used



for the growing the Tech Ed program. A presentation was given to the school board, with a plan to convert this empty facility into a permanent Communications Lab. Finally, the Technology Education program had a dedicated lab for TV and Photograph Production. This Communication Lab is now used for live news report and game show filming and portrait photography units. The lab is used school-wide by a variety of classes, requiring filming with green screen technology. In addition, the A/V Club meets after school in the lab. The lab is presently being converted to an iPad, wi-fi connected, multi-camera format, eliminating wires between components.

In Conclusion

Many technology labs see changes over the years with renovations and new facilities. Kennedy Middle School was able to move from "Industrial Arts" to Technology Engineering, all with minimal structural changes. These once old classrooms and pre-1960 "shops" are history now, but as a result, the Kennedy Middle School Technology Engineering program now offers PLTW-Design & Modeling A&B, Automation & Robotics A&B, Transportation, Communications, Construction, Manufacturing, and Exploring Technology Classes. In addition, student enrollment in the program skyrocketed from 300 to near 1,000 students a year. Much of this increase was from the new female student interest in the program. Female student enrollment went from 9% to 45%. We believe the key contributing factor was not only offering modern curriculum, but the total, now energized lab, environment.

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Write an article for the *Interface* and receive a BOGO discount on your next membership renewal! Submit articles and photos to editor, Duane Apel, at interface.wtea@gmail.com

NORTHEAST WISCONSIN MFG ALLIANCE NEWMA Announces its Ninth Annual Get Real Math & Science Premiere & Other Upcoming Events

Pete Petoniak from WLUK will be the emcee for the Northeast Wisconsin (NEW) Manufacturing Alliance's 9th annual *Get Real* Video Premiere at the Meyer Theatre in Green Bay on October 3 from 4:30 p.m. – 6:30 p.m. This serves as the debut of the newest installment of the Alliance's *Get Real Math* and *Get Real Science* videos. Plus, new this year, the organization will be debuting an employability skills video called, 'How to be successful in the workplace.' There are 10 companies featured in this video giving a tip on employment success. The skills featured in the video are related to the Wisconsin DPI's Youth Apprenticeship's Employability Skills certificate.

Ann Franz, executive director for the organization stated, "The concept of the videos came from a math teacher participating in the Alliance's K-12 task force." Franz added, "She was looking for a tool to show students how the curriculum she was teaching is used in the real world." In 2014, five videos were created to answer the questions students often ask, "When am I ever going to use this in the real world?" The free educational videos include a teacher lesson plan and spotlight real-world problems at manufacturing companies. To date, there have been over 70 *Get*

Build excitement as students explore pathways in technology



Real Math! Videos created. In 2021, the organization debuted *Get Real Science* videos.

Unlike most movie premieres, it is not the stars of videos that are recognized, but rather the educators. At the event signage stating, "Educators are the stars of our community," are displayed and teachers walk down the red carpet to have their pictures taken. There are numerous prizes given away including \$500 cash awards to math, and science departments, along with a Miller Electric Millermatic 211 welder (\$1,900 value). In addition, there will be a \$500 cash award given to a school guidance office. Special thanks to WTEA for being a sponsor of the event.

Companies being featured in this year's videos are: Alliance Laundry Systems, EMT International, and KI. The following companies are featured in the *How to be Successful in the Workplace* video: Alliance Laundry Systems, Georgia-Pacific, Green Bay Packaging, Heartland Label Printers, KI, LaForce, Marine Travelift, Nicolet Plastics, Packer Fastener and Sargento Foods.

The *Get Real Math & Science* Premiere is one of many events the Alliance is sponsoring as part of Wisconsin's October is Manufacturing Month. Other events include the 13th annual Manufacturing First Expo & Conference at the Resch Expo on October 25, 2023. There will be over 200 exhibitors with over half being manufacturing companies located in northeast Wisconsin. For more information go to www.manufacturingfirst.com.

NEW Manufacturing Alliance will also host the 12th annual Excellence in Manufacturing/K-12 Partnerships Awards dinner at the Resch Expo on October 24, 2023. This year's winning schools are Appleton West High School, Fond du Lac High School, Green Bay N.E.W. School of Innovation, Oshkosh Area School District, Seymour Community School District, Two Rivers High School and Wabeno High School. Manufacturing companies recognized for their partnership with education include Advanced Tooling Specialists, Amcor Flexibles, Miller Electric Mfg. Co., Samuel Pressure Vessel Group, Team Industries and Walker Forge. To purchase tickets to attend the event go to: https://NEWMA2023Awards. eventbrite.com.

To see the *Get Real Math & Science* videos and further information to register for October NEW Manufacturing Alliance events, go to www.newmfgalliance. org. Please contact Ann Franz with questions regarding the events at 920-606-7691 or email ann.franz@nwtc. edu.

SkillsUSA	2023-24 SkillsUSA EVENTS CALENDAR	Like us on
Welding Challenges	 Blackhawk Technical College: MiltonOct. 13, 2023 Mid-State Technical College: Wis. RapidsOct. 20, 2023 	facebook
District Competitions	 District 1: Chetek-Weyerhaeuser HS	WI Tech Ed Updates
	 District 4: Oregon HS	Classroom Ideas
Regional Competitions	Western Technical College: LaCrosseJan. 12, 2024 Mid-State Technical College: Wis. RapidsJan. 19, 2024	Connections
	 Ow-Platteville: Platteville: Platteville: Jan. 26, 2024 Northcentral Technical College: Wausau	and more!
51st Annual Sta Alliant Energ	te Leadership & Skills Conference: Madison gy Center & Madison Area Technical CollegeApril 9-10, 2024	
National Leader	ship & Skills Conference: Atlanta, GA June 24-28, 2024	(🗆 🖉 🏹 🔍

...Solar Car Challenge - from page 12

ting COVID-19. So, we spent the next day changing flights, canceling hotels and getting our kids back to Wisconsin. Thankfully none of our team members got sick from the event and everyone got home safely. I am so very proud of our kids, community, sponsors, coaches and school for what we accomplished this past year! This build should have been a two-year project that we were able to pull off in just one year with success. Check out many photos and videos on our website at www.Watertown-STEM.org. For more information visit their website at www.SolarCarChallenge.org

...Compare and Contrast - from page 27

science department worry about how to *explain* the natural world, and focus on how human ingenuity has found ways to *exploit* it. And collectively, let students *explore* to gain the context to make good decisions for their next step. Finally, leave the work of teaching students to *execute* tasks to your counterparts at the Tech. If we can fulfill our respective roles in the system, we'll have a real juggernaut!



WTEA FOUNDATION SCHOLARSHIP **Cooper Radke Hopes to Use His High School Experiences to Inspire His Future Students**

Cooper Radke is a 2023 graduate of Rhinelander High School. He will be studying Technology & Engineering Education at UW-Stout. Below is a summary of his school and community activities, and portions of his essay on why he chose to become a Technology & Engineering teacher.

Ever since I can remember I have been involved in extracurricular activities. I have enjoyed playing soccer for 13 years and plan on playing soccer in college. Our

team had an amazing playoff run my senior season when I was named player of the game for three crucial contests leading up to our high school's first ever trip to the state tournament. I feel fortunate to have been part of a history making moment for the Rhinelander High School soccer program.

I also enjoy playing golf on the high school team. I played basketball until my junior year at which point I changed focus and started the Rhinelander High School Ice Fishing Team. I sat down

with our activities director and asked him what I needed to start a team. After some convincing, I persuaded

two Tech Ed teachers to coach and so began the Hardwater

Hodags. Student interest was high and the team grew to 15 members.

Although the team was official, we had one big issue. Not everyone on the team had equipment. I organized a fundraising plan which involved writ-

ing letters and asking local businesses for donations. I also made cribbage boards and sold them. In a short time, and with help from a teammate, we raised over \$1,400. In our second year the team grew to 20 members and had over \$9,000 dollars worth of equipment. I feel like this is one of my biggest achievements since I led the team as the team captain from it's beginning. It's awesome to see how much the club has grown, the impact it's had on its members, and its promising future.

Another accomplishment I am proud of is being accepted into the National Honor Society. I was also on the math team my freshman and sophomore years and have participated for four years in the Finance and Investment

Challenge Bowl, going to state my sophomore year.

Another experience I'm thankful for is the opportunity to play in the high school band for seven years. Our percussion ensemble made it to the regional and state level for solo & ensemble two years. I am one of the selected band council members which makes financial decisions with the band's budget for fun activities for band students. I was also selected to participate in the Great Northern Confer-

ence Band which is the top musicians in our conference.

Lastly, one of my favorite things to do, is designing and building things in our school's fabrication lab. I've taken advantage of the opportunities we have in the technology and engineering area, increasing my skills and comfort level with table saws, 3D printing, Solidworks, CNC manufacturing, and laser engravers, to name a few. I have built tables, signs, school logos, clothing, trophies, and

teaching aids for our instructors. I am currently working on building a tip-down for ice fishing which would allow tipdown storage to be easier. I also created signs for a local

is something I want to do for future generations."

company called Lassig Farms. They "He inspired me...and that were made out of plasma-cut metal, flap-disked, sandblasted, and powder coated.

> The reason I chose a TE degree is because I enjoy teaching people new

things. My favorite part of school day is shop classes. I really want to become a technology education teacher to have an integral part in all those projects and to inspire students to build better projects.

I love using the laser engravers, print and cut technologies, and the plasma cutter. The person who inspired me to pursue technology education is Michael Wojtusik. He teaches a class called, "Dream It, Design It, Create It," where you can think of something and build it. He taught me that when you put a lot of effort into something it will show when you see the final product. He inspired me in the first class I had with him, and that is something I want to do for future generations.





Cooper Radke

DIRECTORS' REPORTS



ITEEA Focuses on STEL

By Mason Pautsch, WTEA Director At-Large

The 85th International Technology and Engineering Educators Association (ITEEA) Conference took place in Minneapolis, Minnesota, in April. This year's theme was "Learn it, Try it, Teach it! STEL experiences to advance our profession!" It focused on the Standards for Technological and Engineering Literacy (STEL) which is a set of standards used by school districts across the country to guide TE education classroom instruction.

Attendees had opportunities to attend various workshops and excursions around Minneapolis. One excursion was a tour of Stratasys Inc., a world leader in manufacturing industrial 3D printing equipment. A variety of vendors had displays at the trade show. Saint Cloud State University brought many cool demonstrations to the conference allowing attendees to interact with various mechanized construction tools. This included a bricklaying robotic arm as well as what I can only describe as an assistive device that allows the user to lift heavy masonry objects with ease! The trade show also featured minnow races courtesy of the Minnesota Technology Educators Association (MTEEA).

The 86th annual ITEEA conference will be March 6-9, 2024, in Memphis, Tennessee. The theme will be, "The Soul of Stem." Conference and membership information is available on the ITEEA website at Iteea.org.

From Summer to Fall



By Jon Larson, WTEA District D Director

Every year it seems like summer gets more fun, intense, and productive. The WTEA/NEWMA sponsored, Teacher Aviation Day, was a great way to start the summer with some fun and professional growth. We were able to experience a lot at EAA Gulfstream and Plexus. I look forward to using this experience to enhance our programs and partner with our science department and local businesses. After that it was off to an action packed week at SkillsUSA NLSC in Atlanta, where Wisconsin showed we have a lot of talented students and teachers preparing our nation's next wave of skilled labor. I always try to find a chunk of time in the summer when I am "unavailable" for school. This usually happens around July 4th and lasts a few weeks. It's all about fun and recharging with family and friends. Once the end of July comes around I'm mentally and emotionally ready for school to start. Now I start prepping for the year. This year's focus is to commit to a 5S model and mentoring our new Tech Ed teacher. So I've been researching and planning lessons and activities and trying to find ways to engage our new teacher in our culture. I'm excited for this year and ready to meet my new students. Remember to enjoy yourself this fall and find time to disconnect from school and try to recharge just a little bit each weekend. Good luck this fall!



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Explain, Exploit, Explore, Execute Comparing and Contrasting Science-, Technology-, and Technical- Education

By Randy Way, Associate Dean - School of Engineering, Science, and Mathematics, Madison College

Over the last few months, I've been working on the Wisconsin Department of Public Instruction Academic Standards in electricity, electronics, and automation. I wanted to have a bit of quality assurance before the standards writing committee got to see them, so I sent them to my colleagues for peer review. Since many of them are science educators, I decided to frame the idea of technology education in a way that might make sense to them. So, let's start from the lemma that the point of science is to *explain* our observations of the natural world. The operative element of science, and for that matter science education, is to hypothesize and validate through experimentation, mechanisms that explain observed phenomena.

Technology embodies human efforts to *exploit* the natural world. When the first cave man capitalized on the brittleness of flint to make the edge on a spear sharper than the one that could be achieved with wood alone, he was engaged in a technological enterprise – perhaps the earliest application of materials science. Technology is the study of the knowledge of how the laws of nature, which have become known to man

through the implementation of the scientific method, can be exploited to meet human needs. As such, technology education's study of the designed world parallels science education's study of the natural world.

Certainly, some of the students who take science classes become scientists, but the vast majority do not. So why require it? The roots of this decision lie in one of our most cherished American traditions – the guarantee of, and mandate for, a free public education for all citizens - a tradition stemming from the founding fathers' belief that only an educated populous was fit to self-govern.

The tradition of science education in America dates to our founding. Technology education, not so. In 1981, in Jackson's Mill, West Virginia, 21 forward-thinking educators gathered to charter the next chapter of what was known at the time as industrial arts, pursuant to the dual objectives of remedying industrial arts' status as an antiquated discipline, and to address the expanding role that technology policy was playing in the people's self-governance. Out of these dual needs was born technology education, a pillar paralleling science education in support of the competence of the electorate and workforce.

The concept of technology education was on some

curriculum for tech ed to deal with this complexity were underway, so too was the broader academy struggling with complexity's role in the modern world. One response was the launch of the Santa Fe Institute (SFI). Founded in 1984, the institute is a think tank "dedicated to the multidisciplinary study of the fundamental principles of complex adaptive systems, including physical, computational, biological, and social systems". The fundamental breakthrough in the early work of the

level a response to increasingly complex policy questions around technology. As the incipient efforts to develop a

Institute was the realization that all technical disciplines are studying systems. In the words of David Krakauer,

President of SFI, "...every discipline - physics, chemistry, biology, worries about energy and information, but they made the discipline the foreground and those concepts the background. What the founders of SFI said was 'What if you turned that around? What if you made energy, information, computation and so on, the foreground, and you make the disciplines case studies?""

Technology education endeavors

to do exactly this – to bring systems into the foreground and use applications as exemplars. One can witness stud walls being built in both cutting-edge technology education programs and more traditional industrial arts programs. The difference is in the focus. In industrial arts, the point of stapling Visqueen to the inside of the wall and Tyvek to the outside is so that students would know the *procedure*. The same steps in the technology education model are for the purposes of illustrating the *principles* of managing relative humidity and dew point, not so that the student could build something, but so that they will have those schemas available when confronting technological decisions – like evaluating potential strategies to mitigate the risks engendered in warming oceans.

I've not been able to establish any direct connection between the research conducted at the Santa Fe Institute in the 1980s, and the development of academic frameworks pursuant to the objectives of the Jackson's Mill document, though these efforts were contemporaneous. It is noteworthy that the fundamental shift in thinking in each was to flip foreground and background concerns. Perhaps we shouldn't be surprised that the brightest minds in industrial *Continued on next page...*

"This confusion between technology- and technical- education has deleterious effects....it short circuits one of the other important functions of the high school experience – the need to explore."

... Continued from page 26

arts were right with (or perhaps a few years ahead of) the Nobel Laureates at the Institute.

The general education focus that flipping foreground and background allows, and its attendant objective of preparing students to meet the responsibility that accompanies freedom, seems to have all but disappeared from the modern dialogue around education. Nearly every conversation I have these days conflates the purpose of education with preparation for work. Certainly, adult citizens have an obligation to be economically productive, but allowing this obligation to subjugate all others greatly neglects our broader duty to produce adults who are fit to self-govern.

Wisconsin has 3,605,737 active registered voters, each of whom has authority over, and accountability for, the policies that are legislated into law - and the members of the WTEA, collectively, are responsible for assuring that voters can make competent assessments of technology related policy. Of course, preparation to become a thoughtful voter is something that applies to every student in your building. But what of the workforce preparation objective? As of December 4th, 2022, Wisconsin employers sought to employ 3,265,456 people. Of these jobs, 2,118,780 (72%) would be what we considered to be non-technical work. 1,107,880 (27%) carried a Standard Occupational Classification (SOC) that would be considered technical, with job titles including terms like "journeyman" or "technician". The remaining balance of 38,796 (about 1% of Wisconsin jobs) were classified as "engineering".

So, what are we to take from the data about where our students are headed? First, it's that effectively every student is a potential voter. Additionally, about 3 out of 4 students are not going to transform what they learn in technology education into economic productivity. Of the approximately 1 in 4 students that are going to do something technical in their work life, all technical disciplines are represented, meaning that at the high school level, no critical mass of students exists in any one occupational area. This is borne out in the enrollment patterns of the Wisconsin Technical College System. My institution directly serves 41 high schools. Matriculants from these schools are so broadly scattered across our 185 credentials that most programs accept one or zero students from a particular high school each year.

To summarize technology education's unique role, it is neither science education, nor is it technical education. Where science seeks to *explain*, technology seeks to *exploit*. Where the outcome of technical education is to learn to *execute* procedures, technology education seeks to *explicate* principles. These characteristics, and technology education's objective of preparing the entire electorate make it general education, not career and technical education (CTE). There are many reasons why technology education gets lumped in with other high school programs that truly are CTE. Administrators are often confused by the fact that technology education and technical education employ many of the same artifacts (e.g. stud walls). Nor does it help that in the parlance technology education often operates under the moniker of tech ed, which begets confusion between technology education and technical education. And, a less-than-rigorous defense of one's program as general education is incentivized by the fact that Perkins money is available if the program remains misclassified as CTE.

Finally, planning effective technical education is simply a lot easier than developing effective technology education. As a person who has done both – at the high school level and the technical college - I can attest to the fact that it requires less thought to assemble a series of tasks to have students master than it is to do the hard analytical thinking about the principles we want them to understand. This falls right out of Bloom's Taxonomy – technology education, when it's done right, is rich in analysis, synthesis, and creation. The task mastery of technical education is often on the level of application, which is in fact integral to the technical college's Worldwide Instructional Design System (WIDS), with its focus on observable behaviors over the more sophisticated latent cognitive traits.

This confusion between technology- and technical- education has deleterious effects. Besides missing the target in terms of the goals of general education, it short circuits one of the other important functions of the high school experience – the need to *explore*. When high schools trade the difficult-to-implement breadth of technology education for the easier-to-implement depth of technical education, students lack the perspective to make wise college program decisions.

A surprising finding in a recent review of the data was that over half of the programs I oversee did not admit a single student directly from high school in the preceding year. You see results like this when technology education's broad content in construction gets executed as technical education's narrow content in carpentry. This is great for the carpentry trade, but what about the steamfitters, operating engineers, civil engineering techs, etc. – how are students to become aware of those disciplines?

To summarize - education is a system. And, like any other system, things don't get better by optimizing individual nodes. Rather, we make improvements by making the nodes work together more effectively. Technology education serves a critical role in the system, and it's important that we are not seduced into taking the shortcut of turning it into technical education by our society's current myopy for workforce development. Let your colleagues in the *Continued on page 23...*

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