

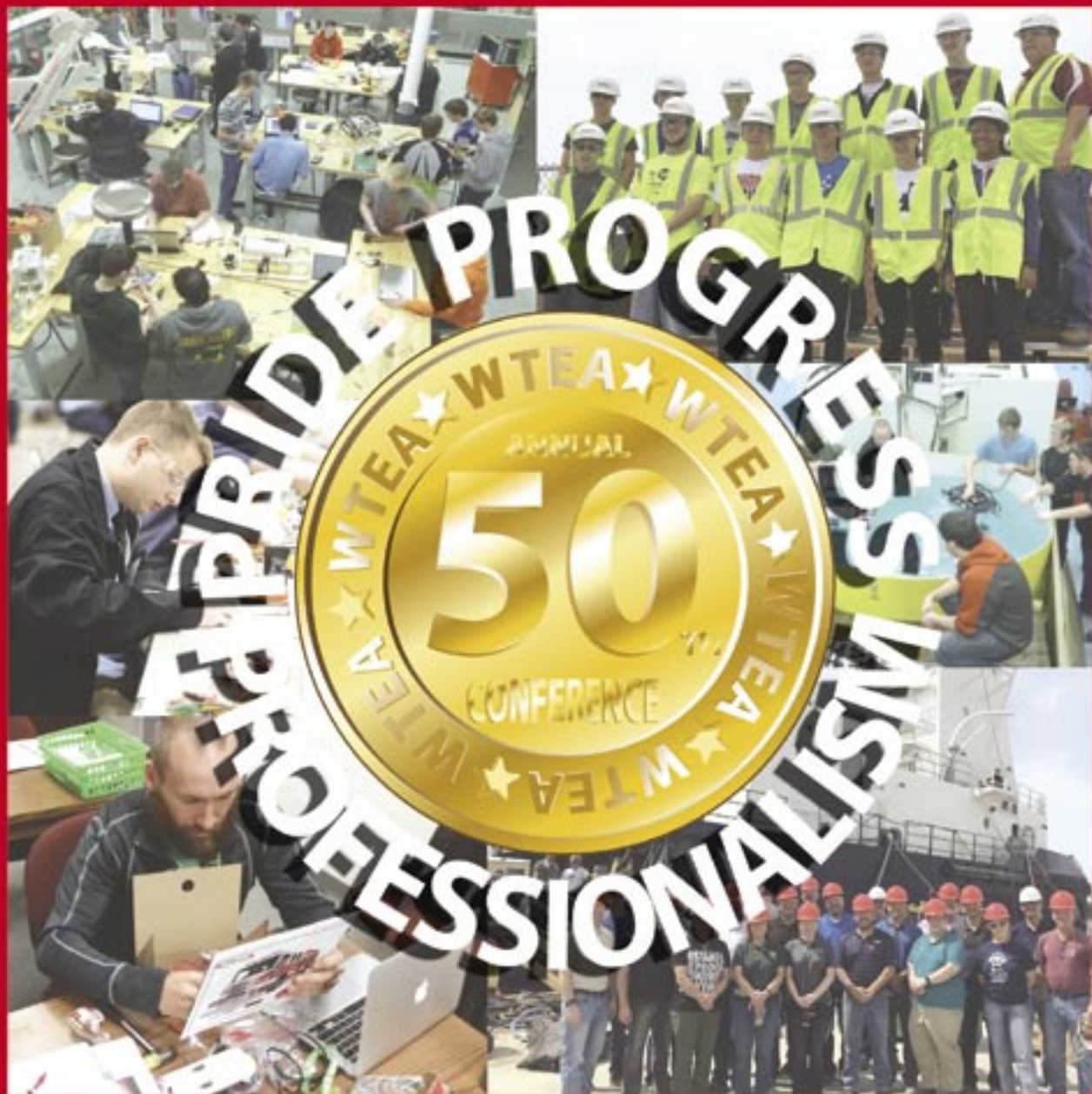
Interface

Journal of the WTEA

Volume 58

Number 1

Fall 2018



Feature Article: Marine Manufacturing Retreat



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WTEA Refund Policy

The WTEA Membership fee is not refundable. The WTEA School Subscription fee is not refundable, but is transferrable to other staff in the same school district. The portion of the non-member conference registration fee equal to the amount of the WTEA membership fee is non-refundable. Refunds for Conference Registration and/or Awards Banquet must be received by US Mail or by email at least 15 days prior to the event. Exhibit space cancelled after Jan. □

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From the President's Desk

By Phil Bickelhaupt, WTEA President

Welcome back for the start of the 2018-2019 school year! I hope this issue of the Interface finds you rested and rejuvenated after spending time over the summer with family and friends! As the summer draws to an end, I often find myself saying, "What happened to summer?" Which means that my family and I had a summer packed full of camping trips, boating trips, family get-togethers, cookouts and the like, making summer fly by! With that said, I hope you and your family were able to spend some time doing some of those same things.

Moving forward into the 2018-2019 school year there are a number of updates to bring you up to speed! First and foremost, this year the WTEA will be celebrating its 50th Annual Conference! Over the summer, a number of the WTEA Executive board members met to continue planning for the 50th Annual Conference. Needless to say, this will be a conference to attend. Mark your calendars now and start making preparations so you can attend March 6 - 8, 2019. Again, this year's Awards Banquet will be held on Wednesday evening rather than Thursday evening allowing more flexibility for Thursday's events. A detailed conference outline will be available as we get closer to March!

Another update to share is the continued struggle to find qualified Technology and Engineering Education teachers. As of my writing of this article in mid-August, there were still over a dozen open positions around the state. What is startling is that our profession is not alone. A number of years ago, CTE teachers were the most difficult to find. I can tell you that in general, teaching positions in many subject areas are becoming increasingly difficult to fill. For example, the number of open positions in math and science respectively are 83 and 47. Moving forward, the WTEA will continue to make connections and develop programs to encourage our students to seek positions in education and, more specifically, Technology and Engineering Education.



The last update is to share my experience attending the ISTE Conference in Chicago this past summer. ISTE (International Society for Technology in Education) holds

an annual conference each year on the latest and greatest trends in Educational Technology. The conference is so large (15,000+ attendees) only a handful of cities in the United States have conference centers big enough to host. My most amazing experience at this conference was to meet and network with a variety of educators from all over the country to see what neat and inspiring things they are doing in their classrooms to engage students in learning. I saw exciting new coding and programming apps, web-based CAD programs, new robotics programs and the latest 3D

printing technology. I was able to get the latest updates from Google, Microsoft, Apple, Cisco, and met with over 1,000 vendors from all over the world. One of the neatest things I saw was a smart hydroponic system that a science teacher used in his class to teach students about farming. In short, the students used sensors and alert systems which they programmed and built using Arduino and 3D printers. The sensors were used to alert them of changes in moisture content, soil conditions and various other things. What was neat was the junction of science and farming with that of programming and technology. It's these types of projects that really get students engaged and thinking outside the box. Overall, it was an overwhelming conference and I was enlightened with many ways to engage students using technology, programming and coding in all subject areas! To this day I am still sifting through all the things I took in at the conference. If you ever get a chance to attend, I highly recommend it!

In closing, as you embark on new opportunities with your students this fall I hope you take time to redesign an older project or develop a new one to take your students to the next level of engagement and excitement!

Best of luck to you during the new school year!



Plan now to attend the 50th WTEA Annual Conference

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WTEA BOARD NEWS

2018 WTEA Annual Membership Meeting Highlights

By Matt Schultz, WTEA Secretary/Treasurer

The following summary highlights the WTEA Annual Membership meeting held March 9, 2018 during the annual conference at the Chula Vista Resort in Wisconsin Dells.

- Board changes:
 - Vice-President - Bob Morehead
 - Tech College Representative - Mike Cattelino
 - Director at Large - Angie Arneson
 - Business and Industry Advisory Team Lead - Brian Albrecht
- WTEA is looking to partner with supporting companies/organizations to sponsor different events at the conference. There are plenty of opportunities for companies to get involved on all three days of the conference. Contact Joe Cointea if interested in learning more. joe.cointea@wtea-wis.org
- Transcript high school credits with local Technical College. Contact your technical college to get this opportunity for your students started.
- CTE Incentive Grants increased from \$3,000,000 to \$3,500,000 with a \$1,000,000 increase over the next two years. 4600 certifications granted in 2016-17.
- There were 52 experienced-based licensee applications for 2017-2018.
- 86 experienced-base teachers teaching in Wisconsin (994 total licensed tech ed teachers).
- The WTEA is encouraging members to host a High-Tech Weekend in your area. Topics can include a wide variety of subjects such as CNC, Lasers, 3-D printers, Carpentry, Auto, Machining, etc. For more information on hosting a High-Tech Weekend contact Jesse Domer at domerj@watertown.k12.wi.us.

*For additional information about this meeting contact any member of the Board of Directors.
Complete minutes are available from Matt Schultz at mjschult@kUSD.edu.*

- Dates to Remember -

Sept. 21 - 22	Masonry Professional Development	NWTC, Green Bay
Oct. 10 - 12	Career Pathways Network National Conference	Louisville, KY
Oct. 14 - 15	SkillsUSA WI Fall Leadership Conference	Wisconsin Dells, WI
Nov. 28 - Dec. 1	ACTE Career Tech National Conference	San Antonio, TX
December 20	Early Bird Deadline - WTEA Conference Registration	
Feb. 15 - 16	SkillsUSA WI State Team Works Competition	Milwaukee, WI
March 6 - 8, 2019	Celebrating our 50th Annual WTEA Conference	Wisconsin Dells, WI
March 27 - 30, 2019	ITEEA 81st Annual Conference	Kansas City, MO
Apr. 30 - May 1, 2019	SkillsUSA WI 46th Annual State Conference	Madison, WI
June 24 - 28, 2019	SkillsUSA WI 55th Annual National Conference	Louisville, KY

Where Did Those First Years Go?

By Bob Morehead, WTEA Vice-President

Back in August, I was sitting at the counter at a lum-beryard, when a man in his late twenties or early thirties approached me. "Bob Morehead, it's been a long time. How've you been?" he asked. I have to admit, that I smiled and played along. I had no clue who this person was. About five seconds later, it hit me. He was a previous student. I had taught him as a seventh grader when I was student teaching and as an eighth grader during my first official year as a teacher. He was a good kid, eager to learn, full of energy - a little rough around the edges, but he was a great worker. When he was in high school, I needed some help with a siding job. I called him up to see if he was interested. He told me that he would love to, but he didn't know anything about siding. To which I replied, "I can teach a monkey how to put on vinyl siding. I need someone that will show up on time, work hard, and be willing to learn." He helped me finish up that project 14 years ago and did a very nice job. It was great to see him!

That encounter got me thinking about my first few years as a teacher. The stress of being a new teacher, the

late nights trying to figure out how to entertain and educate 30 middle school students, was all starting to come back to me. One thing absent from those memories was the WTEA. I always seemed to be too busy to take the time off to attend the conference. In fact, I don't think I attended the conference until sometime after my tenth year of teaching. Wow, was that a mistake! I missed out on all kinds of great opportunities to improve as a teacher like educational sessions and networking that would have made my early years a lot easier.

This spring will mark the 50th anniversary of the WTEA conference. I know there are a lot of teachers who have not attended in years or have never been to the conference. Take some time to think about a teacher that you know who has not been active in the WTEA and encourage them to attend this year's event. Help them get registered, or maybe offer to carpool or split a room. Sometimes all it takes is a little encouragement. Let's help make this conference one for the record books!

Have a great school year. I will see you in March.

An advertisement for Lab Midwest 3D printing. The background is dark. On the left is a large white 3D printer. In the center is a smaller white 3D printer. On the right is a computer monitor displaying a 3D model of a chair. Text in the center reads "3D Printed Parts 23X Stronger Than ABS". In the top right corner is a logo for "Markforged Authorized Value Added Reseller". The website "www.labmidwest.com" is at the bottom.

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NOMINATIONS

Be Part of the WTEA Team



We are currently accepting nominations for the office of **WTEA President-Elect** and **WTEA Secretary/Treasurer**. This is your opportunity to serve your profession in a leadership position. The 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 electronically as appropriate. If you have questions please contact any member of the WTEA Board of Directors.

Secretary/Treasurer

(2 year term): Spring 2019 - Spring 2021

President-Elect

(4 years): 2019-2020 as President-Elect, 2020-2022 as President, 2022-2023 as Past-President

Nominations should be sent to WTEA Past-President Steve Meyer, meyerst@fvtc.edu.

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.

Nominations will be accepted until December 7.

WTEA Awards Nominations

Each spring the WTEA recognizes Technology Educators, Industry, and Technology Education Programs that have demonstrated outstanding achievement at our annual awards banquet held at the WTEA Spring Conference.

The WTEA needs your help, as educators, to identify these worthy teachers, programs, and other professionals 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. Members are encouraged to visit the WTEA Awards page on the website. There you will find the criteria for each award. 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, contact Matthew Schultz, Secretary/Treasurer or Joe Ciontea, Executive Director and tell us who you wish to nominate, where to contact them, and why you feel they deserve recognition from our association. You can also make a nomination on the WTEA website by visiting the Awards page. The awards ceremony will be March 6th, 2019 as an important part of our 50th Annual Conference celebration.



Notes:

- Nominations must be received by November 16th to be considered for recognition the following spring.
- Technology Educators must be a member of the WTEA to be considered for award recognition. However, recipients of the "Special Recognition Award" do not need to be members.
- For a detailed description of the awards, please visit our website or contact any board member.

Lakeview Technology Academy
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mjschult@kUSD.edu

WTEA Awards Committee
Joe Ciontea
P.O. Box 531, Rhinelander, WI 54501
joe.ciontea@wtea-wis.org

EXECUTIVE DIRECTOR

From the Executive Director's Desk

By Joe Ciontea, WTEA Executive Director

We've moved!



Last spring, while most of you were working hard with end of year activities, my wife and I were busy packing up our household in Fond du Lac. Early in May we moved from Fondy (my home since 1976) to the community of Harshaw in Oneida County where our home sits on the shore of a 200 acre lake. While I am still surrounded by boxes of WTEA files, conference materials, etc., every day feels like a vacation. Lots of projects ahead but most are a labor of love. As a result, the WTEA office, mailing address, and bank accounts have moved north as well. Be sure to send your registration paperwork to our new address: WTEA PO Box 531, Rhineland WI 54501.

50th Annual Conference

Our association became a non-profit corporation in September, 1970. About one month later we held our first conference as a corporation. While our 50th birthday won't be until fall of 2020, our 50th conference will be

next March. The Board of Directors has been planning for this event for over a year. We will be inviting a lot of past officers and award winners to help us celebrate the milestone. On Thursday evening during the conference we will hold our 50th Anniversary Gala. Tickets are \$12 and include a meal. Mark your calendar and plan to attend - this one will be something special. Conference schedule of events, registration forms, and other information are in this issue and on our website www.wtea-wis.org.

One Good Turn . . . Deserves Another

Hopefully you had a chance to participate in the pen turning activity at last year's conference. WTEA Past Presidents Mike Roth and Pete McConnell along with several other schools have students turn pens that are presented to retired veterans when they participate in the Honor Flight program. The WTEA would like to know who else is involved in this project and also wants to help anyone who is interested in getting involved. Watch the WTEA website for information or contact Pete McConnell by email at robert.mcconnell@maps.k12.wi.us.

See you in March!

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SUBSCRIPTION



Interface School Subscription

The WTEA school (building or district) 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 \$30, but you can sign up 6 people for only \$125 - that's a savings of \$55 (see fee schedule listed below). Each additional person beyond the initial 4 is only \$15.

How it works:

Complete the form below and list every technology educator in your building. If your department has teachers in more than one building, duplicate the form and provide us with the correct school address for each educator. That way separate buildings in the same school district can be combined to increase your savings. All names listed must be employees of the same school district. Tally the fees on the form and send it along with a check or school purchase order to the address on the bottom of the form. **To be eligible for all benefits of this special pricing, school subscriptions should be sent as soon as possible.**

What you get:

Each person receives: a personal copy of the *Interface*, all association mailings and notices, invitations to attend regional technology education meetings and workshops, unlimited access to 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 school address on the form. This school year subscription will expire the following fall. This form will be published in the *Interface* each fall; it is also available on the WTEA website.

Please type or print all information. Duplicate this form as necessary.

School District _____ School Name _____

School Address _____

School City _____ State _____ Zip _____

Phone (_____) _____ School Fax _____

Local Technical College District (used for regional workshops and meeting invitations) _____

Local Tech. Ed. Contact (Dept. Chair, LVEC, etc.) _____

Email address of local Tech. Ed. contact _____

Name and email	# of years teaching	Fee
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2 _____	_____	\$25
3 _____	_____	\$20
4 _____	_____	\$20
5 _____	_____	\$15

Each additional person is \$15 each; names and school address may be attached on a separate sheet.

Please note: The Interface is published 3 times per year: fall, winter and spring.

Send this form with check or Purchase Order to: WTEA PO Box 531 Rhinelander, WI 54501

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ANNOUNCEMENTS

CALL FOR PRESENTERS

2019 Conference Theme:

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50th Annual Spring Conference • March 6 - 8, 2019 • Chula Vista Resort, Wisconsin Dells

Presenter form must be submitted by December 1, 2018 by mail, fax, website submission or e-mail.

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E-mail: johnston@mwt.net • Phone: 608-689-3033

Middle School Tech Ed Teachers

Do you feel like there are more High School related ideas and projects than Middle School at our annual WTEA Conference? If so, then this year's conference will be one that you will want to attend! New this year will be a dedicated Middle School Project Showcase. More details as the conference gets closer.

Check your mailing label now!

Check the first line of the mailing label on the back cover of this magazine to see when your membership expires.

You may not receive the next important issue of the *Interface* unless your dues are paid beyond 2018.

Please note: Our new mailing address is WTEA, P.O. Box 531, Rhineland, WI 54501



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DIRECTOR REPORTS

The Best of Both Worlds

Sylvia Tiala, District A Director



Tech Ed teachers from west central Wisconsin were treated to a tour of Altoona High School's Tech Ed facilities during WTEA's District A spring meeting. After a guest speaker spoke about academic and career planning, the group moved on to tour the Tech Ed Labs. Both Fab Lab and traditional facilities

provided a backdrop for discussing lab layouts and curriculum. What are the advantages and/or disadvantages of traditional Tech Ed Labs versus Fab Labs? Perhaps a mix of the two is ideal. Thanks to all who attended and the great conversation and camaraderie!



L-R: Brian Groothasen, Ladysmith; Kyle Jeffress, Ladysmith; Bob Morehead, Chetek-Weyerhaeuser; Will Stampfer, Elmwood; Adam Carlisle, UW-Stout (student teaching at Altoona), Brent Steinke, Fall Creek, host Jeff Ballentine of Altoona.

Professional Development Opportunity in Masonry

By Dave Stroud, Director at Large



There will be a FREE professional development opportunity focusing on masonry on September 21-22 at Northeast Wisconsin Technical College in Green Bay, Wisconsin. Exact times and location are still being determined. Those that attend will learn about materials, tools, and techniques

used in the masonry trades by participating in hands-on activities that you'll be able to bring back to your class-

room and implement immediately. A reminder of this opportunity along with times and location will be sent out on the Tech Ed listserve in early September. You can contact Dave Stroud dstroud@ashwaubenonk12.org or David Pries David.Pries@nwtc.edu with questions or to sign up. Space is limited, so if interested, sign up soon.



Tour of Northern Concrete Construction and Big Ox Energy

By Angie Arneson, Director at Large



On May 9 a group of Technology and Engineering teachers toured Northern Concrete Construction in Denmark. During the tour, we learned the ins and outs of how Northern Concrete works and how Big Ox Energy plays an active role at Northern Concrete.

Northern Concrete started with a pickup truck and determination and is now a multi-million dollar corporation. NC operates on a two shift rotation with yard and shop laborers and has concrete wall/flatwork laborers. NC sets the standard for the concrete industry.

Big Ox Energy (BOE) is a sustainable, scalable and cost-competitive waste recycling provider that focuses on offering solutions to the food production industry. BOE is relatively new and plans to make its global mark on society. The process works first with an input, such as food industries by-product, then it is organically recycled and made into renewable natural gas at a production facility. That natural gas creates bioliquids, biosolids and biogas.

As a group we were fascinated by what we saw on the tour and we were excited to use the information learned in our classrooms.



Construction Camp 2018 - A Smashing Success

By Matt Vande Sande, Middleton Cross Plains Area School District

For 12 area high school students, the school year lasted one week longer. The students were part of the first time offered Construction Camp. The Middleton Cross Plains Area School District collaborated with Findorff Construction to show students what the construction trade program is about and allowing them to have hands on experience while learning about the trades profession.

The students spent the first day at Findorff Construction's headquarters to learn about careers, safety, building projects and accounting. Students learned of the various career opportunities in the trades programs and the future needs of industry.



During the week, students went to General Heating and Air Conditioning, learning about the design process, sustainability and technology in design. Students worked with sheet metal, learning how to measure, layout and fabricate various projects. Students went to the Carpenters



Training Center learning how to frame walls, doors and windows. They learned how to work safely to avoid injuries. Students went to the International Brotherhood of Electrical Workers Training Center learning how to wire communication cables properly and bend conduit to the proper dimensions.



On the last day, students visited the McFarland Middle and High School Findorff job site, where remodeling and new building additions are being constructed. Students interacted with multiple trade skilled trade workers, including heavy equipment operators and used a sledgehammer to safely demolish an interior wall.

During the week, students learned of youth apprenticeship programs available to them. Students learned the construction companies are hiring people that want to enter the trades industry. While students are working, the employer will pay the tuition for the students to attend technical college part time and work for the employer. Students in the trades program will not have any student loans and learn about an industry that is in need of workers in all trade areas including: electricians, carpenters, sheet metal workers, HVAC workers, plumbers, and heavy equipment operators.

Findorff Construction hammered home the importance the construction trades program has on the local economy and opportunities available to students. Findorff also drilled in the importance of working safely on all projects. This was a well-run camp, with no corners cut and all activities being measured. Students were shocked to learn about the many different and unique opportunities available in the construction industry.

Middleton Cross Plains Area School District would like to thank Findorff Construction and Matt Vande Sande, Technology Education and Engineering teacher for making this camp successful.



SKILLSUSA

45th Annual SkillsUSA State Leadership & Skills Conference

April 24 - 25, 2018



SkillsUSA Wisconsin Fall Leadership Conference

This fall our Fall Leadership Conference is returning to the Chula Vista Resort on October 14-15. This conference is open to SkillsUSA Middle and High School members. SkillsUSA Fall Leadership Conference (FLC) focuses on developing leadership, team building, and chapter management skills. The conference has training tracks for students and advisors that teach the skills needed to be champions at work in both our communities and in our personal lives.



2018 - 2019 Upcoming Important SkillsUSA Events and Information

Welding Challenge Events

AWI Welding Challenge	October 20, 2018
Eagle River, WI	
FVTC Welding Challenge	October 3, 2018
Appleton, WI	
CVTC Welding Challenge	October 5, 2018
Eau Claire, WI	
BTC Welding Challenge	October 12, 2018
Janesville, WI	

SkillsUSA Affiliation Fee Due November 15, 2018

Fall Leadership Conference

October 14-15, 2018
Chula Vista Resort, Wisconsin Dells

District Competitions

District 1	December 5, 2018
Chetek-Weyerhaeuser	
District 2	Date and Location TBD
District 3	December 11, 2018
Ashwaubenon High School	
District 4	December 3, 2018
Portage High School	
District 5	December 5, 2018
Slinger High School	
District 6	December 11, 2018
West Salem High School	

SkillsUSA Membership Deadline March 1, 2019

Regional Competitions

SWTC Regional Event	January 24-25, 2019
Southwest Technical College, Fennimore	
NTC Regional Event	February 8, 2019
Northcentral Technical College, Wausau	
GTC Regional Event	February 15, 2019
Gateway Technical College, Racine	
FVTC Regional Event	February 22, 2019
Fox Valley Technical College, Appleton	
UW-Stout Regional Event	February 28-March 1, 2019
UW-Stout, Menomonie	

State TeamWorks Competitions February 15-16, 2019 NARI Home Show Milwaukee

46th Annual State Leadership & Skills Conference April 30-May 1, 2019 Alliant Energy Center Madison

55th Annual National Leadership & Skills Conference June 24-28, 2019 Louisville, Kentucky

You can check out all of 2018-19 School Year events at:
http://www.skillsusa-wi.org/wordpress/?page_id=42.

RESPONSES

What is the Best Thing You and/or Your Family Did Over the Summer?

The best thing I did over the summer was attend the ISTE Conference in Chicago. The ISTE conference is the biggest Educational Technology Conference in the world. I attended many great Tech Ed sessions and I got to see and play with all the latest and greatest technology including coding, robotics, networking and computers. I was able to create connections and network with people from all over the globe! With over 15,000 attendees it is by far one of the best conferences I have been to besides the Annual WTEA Spring Conference!

Phil Bickelhaupt



The summer was busy with preparations for another year of growing enrollments in apprenticeship. Outside of work it was a LOT of hot-air ballooning, experimental aircraft association fly-in in Oshkosh, a day-trip to Washington Island, and more. Summary, lots of great family time!

Mike Cattelino



My 2018 Summer was amazing! Truly a rememberable three months, but one of the most memorable was our first family vacation on the East Coast. We toured Niagra Falls, saw the New Hampshire Nascar Race, met Joe Gibbs and Kyle Busch, had lobster in Maine and enjoyed the ocean.

Angie Arneson



Sold my home and moved to a house on the water in Oneida County.

Joe Ciontea



This summer our daughter Alyssa was married to Anthony Sanders. As you can imagine it was one of the best days of both Lisa and my lives. Many of you may know of Alyssa as she traveled with me to many WTEA and VICA/SkillsUSA events. Special events like this put life in perspective.

Bryan Albrecht



The family camped for 10 days in Door County. The most fun we had while there was when we cliff-dived at Cave Point.

Dave Stroud



After meeting newest grandson, Winston Francis, I took my two granddaughters on a road trip from Denver, to St. Louis, to Indiana, to Wisconsin before flying back to Denver. The only way way this trip could have been better, were they to be able to spend time with their great grandmother who passed away in April at the age of 99. In Indiana they made up a cute little song that goes, "Beans and corn!" "Corn and beans!" . . . repeat, repeat, repeat!

Frank Steck



This summer I attended the National Skills-USA Conference for the first time. What an eye-opening experience! I am still blown away at the magnitude of the conference. It was a life changing event for my student. I hope to be fortunate enough to attend again in the future. On the family side, my wife, son, and I spent two weeks in the mountains of Montana. We hiked, fished, kayaked, and lived the dream. I even ran into another fellow Wisconsin Tech Ed teacher at one of the campgrounds.

Bob Morehead



My wife and I were able to spend a week in Siesta Key, Florida - one of the best beaches in the US.

Doug Dimmer



The favorite thing that I did this summer professionally was work with UW-Stout with the WIFAB professional development teacher training events. My favorite thing I did personally involved many weekends up north exploring and fishing for small mouth with my 10 year old son, Dane.

Steve Meyer



The new WTEA mailing address is WTEA, P.O. Box 531, Rhinelander, WI 54501

Hi Everyone! Welcome back to the start of a new year. I am looking forward to another great year. This summer my husband Jim and I had a wonderful time visiting family. My son and daughter-in-law hosted us in Seattle, Washington - kayaking on Puget Sound and hearing the Seattle Symphony playing live to a Star Wars film were highlights. Two weeks later I found myself on Broadway in New York watching the play Hamilton with my sister who is from Boston. Great times with great people!



Sylvia Tiala

This summer for my family was about getting away. We spent many weekend up north with friends and family. We spent 8 days over the 4th of July in Lakewood, four wheeling, boating, and swimming. It was great to be up there with my wife and kids!



Jon Larson

This summer my wife and I took our one year old son on a camping trip and Brewers vs Pirates game in Pittsburgh. We had a wonderful time camping on Lake Erie and in the mountains of Pennsylvania. It was very nice to visit another major league ballpark. If you get a chance, PNC park is a nice place to take in a ball game.



Eric Sutkay


My best moment was a week long trip to Boston. As it may be our last vacation together since our oldest is a soon to be a senior, it was great to see the East Coast. Whale watching, the Freedom Trail, JFK, Fenway, the Science Museum and NE Aquarium were just some of the sites and we did it by traveling the subway system. Such a great trip and tremendous memories made by all!



Tom Martin

Notice:

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FEATURE ARTICLE

Marine Manufacturing Careers Retreat

By Steve Meyer, Photographs by Mike Cattelino

On June 13th and 14th, approximately 25 teachers came together for two days of fun and learning centered around marine manufacturing careers. This event was put on through the WTEA and the North Coast Marine Manufacturing Alliance (NCMMA). The goal of the event was to give teachers a better understanding of the Science, Technology, Engineering, and Mathematics, along with careers and learning opportunities associated with the boat and ship building industry.



A large test tank in the floor at Marquis Yachts for doing buoyancy, leak, and stability testing.

The event included a tour of Marquis Yachts in Pu-laski by Vice-President of Engineering and Design, Josh Delforge. Josh showed the group different processes of building luxury fiberglass yachts.



The top part of a yacht is fixtured on a rolling cart.

The process involves everything from meeting with the customer, prototyping and mock-ups, computer design and simulation, fabrication, and testing. Josh also shared the new development of the multi-million dollar yachts being contracted through the company.



Teachers hear about fiberglass hull design and fabrication.

The recurring theme that Josh shared with the teachers is the knowledge and employability skills that all employees need to be successful in the company. The teachers then spent the evening eating on the Bay of Green Bay, taking sailing lessons, and ultimately getting a boat ride on a yacht. It was a great time had by all.

"The WTEA event was a great experience for us on the industry side and believe the educators felt the same way. The opportunity to have Technical Education teachers at our facility to see in detail all of the trades in action was invaluable. We are fortunate to build some pretty awesome vessels in this region but to do so we require a talented workforce and that starts with the Tech Ed programs throughout the state. The marine industry is growing and to support that growth we are now and will continue to add to all areas of our company. These educators have direct contact with the students already showing an interest in the trades who will soon be entering the workforce. Having the opportunity to show educators what we do in the marine industry opens the door for future connections between these students and us in the marine industry."

Josh Delforge,

**Vice-President of Engineering & Design
Marquis Yachts**



On the 14th, the attendees reconvened in Sturgeon Bay and took a tour of Fincantieri Bay Shipbuilding. The 63 acre facility does new ship construction and ship repair. The company almost triples its number of employees to work on approximately 13 large ships as they are docked when the Great Lakes are shut down in the winter months. The employees cover all areas of technology and engineering such as electricians, engineers, quality managers, safety advisors, fabricators, etc. The size of the ships and the material and fabrication scale was massive.



Workers build up the hull of a ship.

The teachers heard from human resource managers and others about the skills and knowledge gap in the shipping industry and also reaffirmed the need for young people to have a broad background in the STEM areas along with strong communication and problem solving skills.

During the two day event, teachers were also introduced to the Sea Perch underwater robotics student competition, and a presentation from Hands On Deck, Inc. boat building. These organizations provide curriculum and learning opportunities to apply STEM skills and knowledge to real world learning activities associated with marine technology.

Overall, the two day event was an absolute blast. All of the teachers had a great time and learned a lot. A special thank you goes out to our hosts, along with Ann Franz, NEW Manufacturing Alliance (NEWMA) for helping to coordinate the event. The WTEA will be investigating doing this and other STEM related retreats in the future.



Teachers learn about the structure inside the hull of a ship.



Teachers look at the massive automated welding gantry for welding large sheets of steel together for the ship hulls.

"The NEW Manufacturing Alliance and North Coast Marine Manufacturing Alliance wanted to provide a professional development event for tech ed teachers that not only showed how things are made, but demonstrated the end product in action. We were so excited to tour teachers through Marquis Yachts to see the process and careers in making a luxury yacht and then have the teachers get out on the water with a 1.3 million dollar yacht. Tech ed teachers are so important to our organization. Their passion ignites the interest in students to consider a career in manufacturing. Without tech ed teachers, we would not be able to find the talent we need. In addition, the skills taught by tech ed teachers have given students the ability to enter a manufacturing field. We are very interested in hosting a similar event in 2019."

Ann Franz, Director of NEW Manufacturing Alliance



The group of teachers participating in the event.





50th Annual Technology Education Conference & Trade Show

Tentative Conference Overview

Wednesday, March 6, 2019

5:30 - 8:00 p.m. Conference Registration

6:45 - 9:00 p.m. Awards Banquet

Thursday, March 7, 2019

7:30 a.m. – 3:00 p.m. Conference Registration
 7:00 a.m. – 10:00 a.m. Project Showcase Setup
 8:00 a.m. – 4:00 p.m. Trade Show and
 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 Evening

5:00 p.m. – 7:00 p.m. 50th Anniversary Gala
 (Ticket Required)
 7:00 p.m. – 9:00 p.m. President's Reception &
 Silent Auction

Session Topics Include: Underwater ROV Fabrication, Building a Desalination Machine, Tiny House Construction, The STEAM Movement, DoD Cyber Training, Plumbing and Electrical Techniques, Aerospace Technologies, K-12 Energy Education Program (KEEP), Robotics, Apprenticeships, Retirement Strategies, Innovation and Design, Automotive Technologies, Welding and Machining, Building High Mileage Vehicles, Project Showcase, SkillsUSA, 3D Printing Techniques, Middle School Roundtable, Manufacturing Project Ideas, New Teacher Boot Camp, and much more!

Friday, March 8, 2019

7:30 a.m. – 11:30 a.m. Conference Registration
 6:45 a.m. – 7:45 a.m. Early Riser Breakfast
 7:45 a.m. – 8:30 a.m. WTEA Membership Meeting
 8:45 a.m. – 12:15 p.m. Concurrent Sessions,
 Vendor Demonstrations & Project Showcase
 TBD – Hands-on workshops at Portage HS
 12:30 p.m. – 2:00 p.m. General Session/Luncheon
 2:15 p.m. – 3:30 p.m. WTEA Board Meeting
 & Regional Meetings

Thursday Keynote Speaker



Wilson R. Jones

President and
 Chief Executive Officer
 Oshkosh Corporation

Friday Keynote Speaker

Jim Bensen

President Emeritus
 Bemidji State University



Chula Vista Resort

4031 River Road, Wisconsin Dells

www.chulavistaresort.com

Room Reservations: 1-877-745-6998 Ask for WTEA Conference Rate



2019 Conference Highlights

March 6, 7 & 8



Awards Banquet - Wednesday Evening

Trade Show - Thursday

50th Anniversary Gala - Thursday



President's Reception & Silent Auction - Thursday

Keynote Speakers - Thursday & Friday

Educational Sessions - Thursday & Friday

Project Showcase - Thursday & Friday



Early-Riser Breakfast - Friday

WTEA Annual Membership Meeting - Friday

Colleague Networking - All 3 Days



To complete an electronic version of the WTEA membership/registration form, go to www.tinyurl.com/WTEA-Conf

WTEA Membership Application & 2019 Conference Registration Form

Membership year runs from September 1st through August 31st

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 the appropriate boxes below and total amount due.

Membership Fees: [] 3 year membership - \$75.00 [] 1 year membership - \$30.00 \$ _____

Spring Conference EARLY BIRD Registration (Must be postmarked by December 20, 2018)

[] \$130 members [] \$160 non-members \$ _____

Spring Conference Registration (After December 20, 2018:

[] \$155 members [] \$185 non-members \$ _____

WTEA Awards Banquet (Wednesday, March 6, 2019) [] \$28 \$ _____

50th Anniversary Gala (Thursday, March 7, 2019) [] \$12 (includes meal) \$ _____

[] Bill my school district - purchase order is attached [] payment enclosed **Total \$** _____

Send completed form with payment or school purchase order to: **WTEA, P.O. Box 531, Rhinelander, WI 54501**

Phone (920) 904-2747 • E-mail joe.ciontea@wtea-wis.org

Please note new WTEA mailing address.

If your school uses ACH payment please contact the WTEA for new bank routing.

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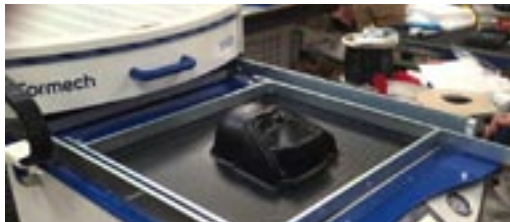
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2018 WTEA Technology Educator of the Year

Rich Hemler

Portage High School

Education

High School: Portage High School Class of 1993

UW-Stout - B.S. in Technology Education 1997

UW-Platteville - M.S. in Industrial Technology
Management 2006

Currently attending UW-Stout - M.S. in Career and
Technology Education

Educational Employment

Portage Community Schools since 1997

I currently teach manufacturing courses at Portage High School. These courses include Materials and Process, Welding Fabrication, and Manufacturing. I also co-teach a STEM science course with a science teacher.

Thank You

The WTEA had asked me to write something for the Interface regarding the teacher of the year award.

I would like to thank fellow teachers, colleagues, and the WTEA for the recognition for the Teacher of the Year award. This award was a great honor and was very humbling.

In some ways, to be brutally honest, I feel guilty for the recognition. A few years back I was ready to get out of the profession. Portage lost two great Tech Ed teachers to other districts, many of my Tech Ed friends in other districts were getting out of teaching altogether, and my department was systematically dismantled as people retiring were not being replaced as a way of saving money. My friends were no longer teaching, I no longer worked with two of my greatest friends, and those retiring were the guys that guided me into this profession when I was their student in high school. John Morstad, Dan Jones, Norm Bednarek, Terry Tjugum and Mark Parrott made a department that was second to none. It seemed like a good time to get out.

I was working in a mold shop and was not planning on going back to teach at the end of the summer, but one of the tool makers told me to hang on and go back. This was one of those fork-in-the-road moments and it was some of the best advice ever given to me.

Over time, administration has changed and we have been adding staff back to the department. The teachers



that I now work with are a really solid group of guys. Coincidentally, two of them are Portage High School Tech Ed alumni. I work with a CAD teacher who has a bill of materials that is second to none. This has been a very rewarding experience for me being in a department that was predominantly influenced by all of the Tech Ed teachers I mentioned above. Often we don't realize we're part of a legacy until one reflects back in a situation like this.

Many Tech Ed teachers in the state may be at that same fork in the road, and if you are one of those people, I would like to give you the same advice and say hang on. You do have the skills, attitude, and initiative to go out and do whatever you want. You have a vast network of people that you could call tomorrow and start a new job without skipping a beat. I would bet that the other job pays a little better, you would have a lot less stress, and you would never need to deal with nonsense paperwork like EE. I don't mean to sound condescending to the people we work with every day, but most, if not all, Tech Ed teachers could quit their job tomorrow. Think about how powerful that is. I don't care if you are 21 getting out of college or in your 60's coming back out of retirement to teach for a second time to help a district. YOU CHOOSE TO DO THIS. Being a Tech Ed teacher is not something that you have to do - it is something that you want to do. Thanks to all the people that have been hanging on and choosing to be a Tech Ed teacher.

AWARD WINNER

2018 WTEA Middle School Program of the Year Parkview Middle School's Technology & Engineering Program: Providing Exploration and Career Learning Opportunities for Our Students

By Corey Hansen and Phil Layden, Parkview Middle School

Middle School is a time when students are formally investigating career paths and professions they may be interested in pursuing. We strongly believe that our technology and engineering courses at the middle school help our students in this process. We offer a wide variety of exploratory course offerings designed to broaden their exposure to technical and engineering work and also to prepare them for pathways that are mapped out at our high school. All sixth graders have a required exploratory course and there are eight electives for seventh and eighth graders to choose from. We also have a semester-long computer science course that all eighth graders are required to take that falls under our Technology & Engineering department. As a PLTW school, many of the electives are Gateway courses we have been trained to teach.

Course Offerings at Parkview

- 6th Grade Exploratory
- Automation & Robotics
- Design & Modeling
- Computer Science for Innovators & Makers
- The Magic of Electrons
- Manufacturing
- Technology Engineering & Design
- Transportation Systems
- Green Architecture
- 8th Grade Computer Science

Students may take any and all of these courses if they are interested in them as electives. They can learn to use the same design, robotic automation, and architectural software that they will encounter at the high school, which will allow them to take their learning even higher when they get there. Seeing 6th graders create animated parts drawings or write programs to automate robots is exciting and inspiring.

One of the core concepts that we emphasize in all of our coursework is using the engineering and design process to solve real world problems. We feel that the ability to understand why a project is worth pursuing and figuring out is just as important as being able to do the work required to create it. The technologies available to our students, including 3D printing, CNC equipment, and

manual tools like mills and saws make it possible to produce outstanding finished products, but that is not an end in and of itself. We want our students to use equipment like this as part of a larger process of defining problems, brainstorming solutions, using the tools necessary to implement a solution, and then evaluating how well they did when they are finished and sharing that information with others. We do not know what problems they will need to solve when they graduate from high school or post-secondary training, but we can equip them with the knowledge of how to address whatever they face.

We have worked hard to align our coursework to Wisconsin's DPI Standards for Technology and Engineering and are constantly re-evaluating course content to make changes based on student instructional outcomes and changes in technology, industry and manufacturing. We are part of our district's Technology & Engineering advisory board and that has helped us to stay informed about changes and innovations at the high school, post-secondary schools like NWTC, and local business and industry. We work very well with our high school colleagues and that helps us to have a cohesive 6-12 program for students.

We also believe that students should have other ways to pursue interests in technology and engineering outside of class, so we have a number of different club activities available for them to choose from during the year.

Clubs and Additional Learning Activities

Each of these provides a different opportunity to apply STEM concepts to real-world problems and design challenges.

For our kids, STEM Club is Technology & Engineering education what football or volleyball are for sports. Students who love



STEM topics are able to meet after school once a week with other kids who share their own interests, whether 3D modeling and printing, CNC work, or micro-electronics. Sometimes specific things are set up for them to do, and sometimes they are free to choose what they want to learn. We have also taken STEM Club students on field trips to local manufacturers to enhance their understanding of what careers are out there for kids who love STEM.

SeaPerch students learn basic soldering and electronics principles, and use physical science concepts



like buoyancy and application of forces when building and testing their underwater submarine. They also have to present information to a judging panel and are inter-

viewed about their team's engineering process and how they solved the problem they were given.

In VEX Robotics, students use their knowledge of programming, mechanical design, and gearing/torque/power relationships to build robots designed to solve a different problem each year.

This is especially nice for students who are with the program multiple years. Experience helps, but they still have to solve a new and unique problem to succeed at the competitions. They learn iteration in design, and are always troubleshooting their robot and trying to find ways to improve its function when being driven by students or working autonomously from a program.



The Brown County Home Builders Association sponsors a project build each year, and Parkview students have a tradition of taking part in it. They have built potting tables, entryway furniture, and other things depending on what the contest guidelines are. It allows them to col-

laboratively generate design ideas and then apply their knowledge of woodworking, metals, or whatever is needed to complete the build. It is also an opportunity to teach kids more advanced techniques and skills because the group is small and highly motivated to create a quality project that will be auctioned off to the public.



One of the things middle school students work on at Parkview is career exploration. SkillsUSA is a successful program at our school that helps students by exposing them to many areas of the world of work.



The partnership in SkillsUSA between schools and industry working together to ensure America has a skilled workforce make this program a great opportunity for students to practice workplace ethic and demonstrate skills. The students have professional dress requirements, learn independence and practice problem solving skills and time management when given a task to complete at competitions.

As a Technology & Engineering department, our hope is to ignite the learning spark inside of our students that will show them pathways for great career opportunities and options they may not have considered previously. Nothing makes us prouder than to hear a student say how excited they are to take courses at the high school, or talk about possible career choices after that. Dave Stroud, Tom Barnhart, and Jeremie Meyer are outstanding teaching colleagues at Ashwaubenon High School that take our kids and connect them to career pathways and learning opportunities in Architecture & Construction, Manufacturing, STEM, and Transportation & Logistics. What they learn there will take them to post-secondary careers and continuing education in any of those fields and help them become contributing members of our communities in Northeast Wisconsin and beyond.

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Plan now to attend the 50th WTEA Annual Conference

"Pride, Progress, Professionalism"

March 6 - 8, 2019 • Chula Vista Resort • Wisconsin Dells



UW-Stout TEECA Members Attend WTEA Conference

By Andrew Kleiber, TEECA Vice-President

This past March, our University of Wisconsin-Stout Technology Education organization (TEECA) attended the annual WTEA Conference at the Chula Vista Resort in Wisconsin Dells. Many of us were not new to this conference. Most of our members had been returning to the WTEA conference for their second or even third time. However, there were some new faces joining us this year. Knowing what to expect, we all went in with positive attitudes and were eager to learn.

The first meeting we attended was the general welcome hosted by Steve Meyer, the WTEA President. That was followed by the Keynote Address by Guy Madison from the Michels Cooperation. He emphasized the importance of technology teachers because there is such a huge demand for skilled labor across America.

The most important meeting many of us attended was the New Teacher Seminar hosted by Steve Meyer. This seminar was informative, insightful and quite honestly, got a lot of us excited to become teachers. Some of the topics we covered were seeking employment, elements of teaching, methodologies, how to handle certain situations, and more. One piece of insight that Mr. Meyer shared with us was a strategy he called “failing forward.” It’s where you set students up to fail right away. Then the student can find the mistake(s) and solve the issue through problem solving. I thought this was an incredible piece of knowledge to take with me from the conference.



Another very cool part of the conference was when our very own members and UW-Stout faculty lead two different seminars. “Women in Technology: Perspectives from the Field” was hosted by Sylvia Tiala and two students, Michaela Guerrini and Anna Stamschrör. They

shared their perspectives from a field that’s heavily influenced by men and answered questions. Then there was a Technology Education update from Zackery Olson and Logan Rudis. They talked about the current state of Technology Education at UW-Stout.



The rest of the conference was filled with talking to teachers. The majority of the TEECA members spent a great deal of time talking to teachers at the Project Showcase. There were a ton of different student projects put on display for conference attendees.

One take away from attending this conference that we all agreed on as an organization was this - if you didn’t want to graduate tomorrow and go teach just from attending this conference, technology education isn’t for you. This conference got us hyped up, excited, and eager to get out into the field of technology education. Everyone from TEECA had a great time and are all looking forward to attending the conference in the future.



What is Old is New, Again

By Mike Cattelino, Fox Valley Technical College

If you have followed my recent articles, you know how passionate I am about apprenticeship. I could go on for the length of this article as to why that is, but I will keep it short. For me, apprenticeship opened doors that ultimately led me to where I am today - Apprenticeship Manager at FVTC. Apprenticeship is not a "speed to market" path to a skilled labor force, but more of a sustainable training model for a business with its eyes on the future. I worked my way through a machinist apprenticeship in the early 90's and taught machinist apprentices for several years when I first started at FVTC. The career path was certainly sustaining for my family. It's something I will always be grateful for the opportunity to be involved through the support of my previous employer.

Earlier this year Wisconsin Assembly Bill 745 passed both houses of state government and was enacted in April. It is "An Act to create 106.07 of the statutes; relat-

ing to: participation in an apprenticeship program by a high school senior and granting rule-making authority." (<https://docs.legis.wisconsin.gov/2017/related/enrolled/ab745>). This means a senior in high school can be a registered apprentice. Consider the opportunity for that focused senior that knows for sure that he/she wants to be a Steamfitter, or Machinist, or Electrician, etc. That focused young adult may have worked with an employer his/her junior year through the Youth Apprenticeship program and now has high confidence in this as a career path and has a supporting employer. That person could do another year of Youth Apprenticeship. If the student seems ready and the employer supports it, it would seem like a great opportunity to go the registered apprenticeship path.

This is certainly not a path for every CTE student, but hopefully you will have an opportunity for this new law to materialize with one of your students soon.

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Project Based Learning in Technology Education

By Levi Zuck, South Milwaukee High School

Today there are many different teaching strategies and initiatives aimed at boosting students' engagement and learning. Project based learning is an instructional strategy that has interested me as a high school technology and engineering teacher for some time. Project based learning is designed to create an environment that is more open to student choice and the 21st century skills. According to the Buck Institute for Education, "Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging and complex question, problem, or challenge." (https://www.bie.org/about/what_pbl) The projects require a deeper level of thinking from the students and the teacher to serve in the role of a facilitator. It's important to understand that simply completing projects is not project based learning. Students need to use critical thinking, communication, collaboration, and creativity to solve authentic problems. This sometimes involves creating a project, but the project is not the sole focus. The process students go through to solve the problem is the focus of the most important aspect of project based learning. I have found that while challenging, project based learning is worth the effort and has proven beneficial for all my students.

Woodworking at the high school I attended as a student was traditionally a particular project assigned by the teacher for the student to complete. The teacher would give the students a detailed list of procedures that the students would follow like a recipe. This would lead to having twenty identical projects with no creativity other than the different applied finishes. These projects were designed to teach students how to follow a procedure, measure, read a plan, use equipment and tools safely, and understand the fabrication processes required to complete a project. While there is nothing wrong with learning these skills, in today's world couldn't we do more for our students? This question has been on my mind for a few years. What if the students designed the project and what if that project was used to solve a problem? Then I began to imagine students working as a group to create an even larger project.

Students would learn the same skills they would from an individual project, but could also learn communication skills, collaboration, critical thinking, and creativity. With my experience working in industry, I know that there are

struggles in working with others to solve problems and that the solutions are often not easy to figure out. It is necessary to integrate the engineering design process and collaborate with others in order to solve the problem.

Last year in the fall, I presented a problem to my Materials and Processes class. In this class, students learn the manufacturing process including designing, material selection, budgeting, fabrication, and production. The class was made up of eight male students ranging from freshman to seniors. Each student had a different background and brought a different set of skills to the class. The problem I presented my students with was that they needed to design a kiosk that could be used in the school store, as well as be used as a mobile store to sell merchandise we produced in the Technology & Engineering department. The students started off by looking at ideas and determining criteria and constraints. They went to work using computer software to design their ideas for the kiosk. The students then had to use their communication skills to present their ideas to the marketing class at our high school. They used feedback from the marketing class to modify their design. The students had to collaborate as a group to come up with one class design. They decided on one kiosk design as a base, and then used ideas from all the other designs to create an ultimate kiosk. The next step was to determine material type and quantity. This did raise some conflict in the class as different groups had contrasting visions for the kiosk. It was difficult as a teacher to step back, but necessary in order to allow the students to settle their own conflicts. It was amazing how well they handled it without teacher interference. The students began the fabrication process of constructing the kiosk. They created a cut list for the material as a group, determined an action plan, and divided the work load. There were several problems that arose, but I let each one be a learning experience for the students to develop their collaboration, communication, and problem solving skills.

Before we began the project, I gave the students a "pretest" to see what their understanding of problem solving, collaboration, designing, and constructing a project was. When asked about problem solving and designing a product, they had a general idea of defining a problem but other than that, there was not a lot of consistency in their answers. The same held true on the ideas of collaboration, conflict resolution, and criteria to determine if the solution

will work or not work. It was quite apparent that the students did not have a lot of experience with working on larger team projects and solving problems collaboratively. As we worked through this process, I did have to do some direct instruction regarding safety, measurement, the engineering process, marketing, fabrication, and at times, project management. Student engagement remained high despite direct instruction from the teacher because of their need to learn this information to solve the problem.

My focus was always on the process and 21st Century concepts that the students were developing. The students did not complete the kiosk by the end of the class, but once again the focus is the learning process, not the final project. As a side note, due to the engagement of the students, I still had some of them come down on their free time to continue to work on it. I have not had that happen before, which was great to see. I feel that was due in part to the structure of the class and the investment of the students in the project.

What did the students gain from project based learning? From my observations, they became more independent in making decisions and started relying on each other when solving problems. The responses from the students using project based learning were positive. One student explained, "I like the project based learning instruction because we got together as a class and made decisions for the kiosk together. To me traditional classroom instruction is based on what the teacher thinks what the design should be and for the students to build it." Another student said, "It gives you a more realistic view," while another student said, "it was more independent." Some students did say that they would have liked "more directions and individual projects" and "more small projects." I feel this comes from the fact that this is how it was done before and they are more comfortable with that style of teaching. Project based learning forces the students and teacher out of their comfort zones.

I assessed the students on their 21st Century, which can be challenging because it is more subjective compared to knowledge based assessments. Each student was assessed at the beginning, middle, and end of the semester. I also had the students complete a self-reflection on their own employability skills using the state's assessment rubric. While each student was at a different skill level, I did witness that each student made progress in their ability to communicate, collaborate, problem solve, and use creativity. For example, as students started working on this project, they often came to me for directions and to solve problems. As the project went on, I noticed that the students did not come to me as often for advice. If the students did come to me, they already had an idea, they just needed me to verify it before they began. This

demonstrated their ability to problem solve and make decisions on their own with their classmates. Their communication skills also improved. The first time they presented their kiosk design to the class, most of them struggled to clearly communicate their ideas. During the final week they presented their progress to the class. While they still have room to improve, they were able to put together a good presentation and clearly present their ideas.

Project based learning can sometimes be a cumbersome process with struggles and trial and error. From my experiences in the workplace, I can tell you this is a closer representation of what actually happens in the world outside school than the traditional ways of teaching. Project based learning gives the students the opportunity to guide their own learning and make decisions based on their own work and research. While it can be initially scary for teachers to let go of their control in the classroom, it gives students an opportunity to discover on their own. This leads to a stronger learning connection. My recommendation to all teachers is to try project based learning on a small scale and continue to develop more complex projects over time. While it is challenging, the reward is well worth the work and the student's investment and engagement will be improved. Project based learning leads to an improved learning environment for the students that promotes real world skills.

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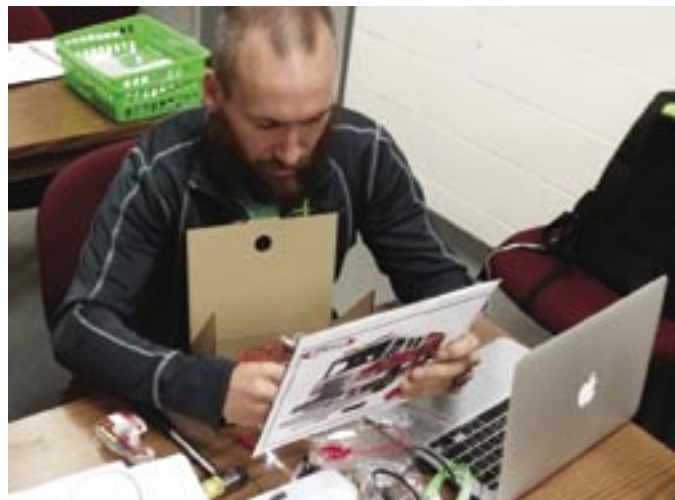
WiFAB Retreats Held at UW-Stout and Fox Valley Technical College

By Steve Meyer, Fox Valley Technical College

During the week of June 25th and the week of July 23rd, the University of Wisconsin-Stout and Fox Valley Technical College each held week long FABlab training sessions called Teacher Retreats. These retreats, known as WiFAB West and WiFAB East are intended to give teachers an immersion in the design process used by companies when coming up with new products, processes, and systems. This was the third year of the WiFAB teacher training retreats. Ken Welty, a UW-Stout School of Education professor, taught the retreats with Steve Meyer, manager of STEM education and development at Fox Valley Technical College, and Laurence Charlier, Fab Lab Director at Northwestern High School and a Technology and Engineering teacher.



During the week long retreat, teachers participated in multiple design challenges focused on different topics such as brainstorming, reverse engineering, sketching, defining design criteria and specifications, modeling and prototyping, coding, testing, etc. Such design problem/opportunities included designing an earbud holder for headphone, researching the electrical requirements for optimizing a solution to a light for a dog's collar to provide visibility at night, design and programming of an automated illuminated sign, and others. Although many digital fabrication machines were used and lots of items



were fabricated, the main purpose of the retreat was to have teachers experience the many different processes that technical employees use to solve problems. The ultimate goal is to help teachers understand, feel comfortable with the process, and give them project management experiences so they will implement design and digital fabrication with their own students. Participants leave the workshop with working prototypes, instructional materials and teaching strategies. Focusing on simple problems, makes it easy to uncover and target age-appropriate Science, Technology, Engineering and Mathematics concepts and skills. Design process thinking and methodologies are a great way to implement real world STEM based activities. "What we're offering is the STEM curriculum and how to use the resources in the school to support and enrich STEM education," Ken Welty said.

Many of the teachers involved in the retreat are from schools who had recently received the Wisconsin Economic Development Corporation (WEDC) FABlab Grant. With this grant, their schools will have funding to purchase and implement digital fabrication devices such as laser engravers, 3D printers, and CNC milling machines into their classrooms. Without proper training on the use



of the design process, machines such as these are often underutilized for learning and are thought of as just part production machines. The real learning for students is when these machines are used as an aid to allow students to quickly produce a prototype that helps bring the design process to “life.” “Fab labs empower students to learn and apply problem formulation and problem solving skills. These labs are also valuable tools that innovative teachers can deploy in delivering the key learning outcomes their students require to thrive in the technology-driven 21st Century,” said Randy Hulke, UW-Stout Executive Director - Discovery Center.

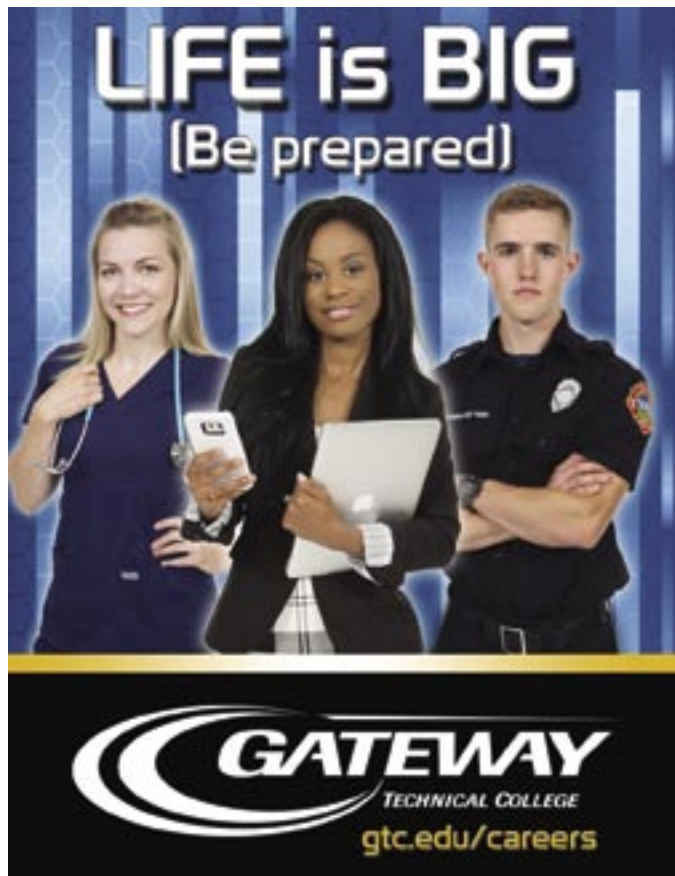


The two different training events were full with approximately 20 participants for each event. The participants came with diverse backgrounds in both the formal and informal education sectors. There were Mathematics, Science, Computer Science, and Technology and Engineering teachers along with Media Specialists, LVEC Coordinators, Curriculum Directors, etc. in attendance. Along with actively learning about the design process, FABlab Retreat participants also went on multiple tours of business and industry to see the process in action. Some of the companies toured were Prototype Solutions and Phillips Medisize in Menomonie and Bemis Company, Inc. and Pierce Fire Trucks located in the Appleton area. Many of the teachers commented how it was so helpful to see the design process being used in industry. In a UW-Stout press release, Chancellor Bob Meyer said student engagement “comes alive” when schools use design thinking. “This professional development retreat focuses on challenging students to imagine solutions to problems, and to make their solutions come alive leveraging Fab Lab tools,” he said. “UW-Stout is proud to partner with Fox Valley Technical College in developing and delivering this unique, top-quality Fab Lab professional development to Wisconsin’s K-12 educators.”

The WiFAB Cooperative partnership between the WEDC, UW-Stout, and FVTC is planning to have more training retreats along with shorter Pit Stops throughout



the year to help teachers implement the design process into their curriculum. Resources will also be provided by the partnership for individual training, FABlab setup, and technical help. Along with training, the group is developing and organizing a WiFAB web portal for housing FABlab and design process activities and curriculum. “It is important that teachers support each other’s efforts and create a sense of community as they operationalize Fab Labs across the state. WEDC recognizes this need and has created the user-driven WiFAB web portal to bolster this growing community,” said Randy Hulke, UW-Stout Executive Director - Discovery Center. You can see the beginning of this site by visiting <https://www.wifabcooperative.com/>. For any other information on the WiFAB Cooperative please email Randy Hulke at hulker@uwstout.edu or Steve Meyer at meyerst@fvtc.edu.



Build an Underwater Robot at High-Tech Weekend

By Matt Schultz, LakeView Technology Academy

Building an underwater robot or ROV (Remotely Operated Vehicle) is a simple hands-on project that you can do with students of all ages. I have been building underwater robots for seven years now, ranging in complexity. My students have built a variety of control systems ranging from the use of Arduino microcontrollers to double-pole double-throw switches with relays. No matter the skill or difficulty level, building a ROV with your students is sure to engage and stimulate creativity in your classroom. For years I have been sharing this project with teachers from across the state, whether it was an invitation to build one at my school over the weekend, writing articles in the *Interface*, or presenting a break out session at the WTEA Conference. I believe this project is awesome, simple, and anyone can do it for a minimal budget.



Through various discussions, I understand there are several teachers who are serious about building a ROV and want to gain more knowledge and experience. An opportunity to get together for a few days to actually build their own seems like a good idea. So, in partnership with the WTEA, LakeView Technology Academy will be hosting a High-Tech Weekend to design and build ROVs with

teachers from across the state. During the two-day event teachers will design, build and test an underwater robot of their own design. Plans, sample ROVs, materials and equipment will all be included in the training. By the end of the session, you will leave with sample curriculum, plans and confidence to build your own ROV with your students in class. You will also get to keep the ROV you built to bring back to school to get your program going.

Across the state there are various competitions related to underwater robots. Sea Perch is an organization who partnered with the Navy and MIT to create a simple kit for middle and high school students to build a ROV in the classroom and then enter it at various competitions. MATE, or Marine Advanced Teaching Education, also hosts an annual conference in partnership with the University of Wisconsin-Milwaukee where students design and build their own robot rather than from a kit. Both competitions offer an opportunity to take your underwater robot to the next level and compete against other schools.

If you are interested in attending the training at LakeView on Friday, November 30th from 5:00 to 9:00 pm, and Saturday, December 1st from 8:00 a.m. to 6:00 p.m. please register at the WTEA website. Dinner will be provided Friday and lunch will be provided Saturday. The cost of the training is \$275.00 and can be paid on the WTEA website. Seats are limited so please don't hesitate to sign up. Information related to the high-tech weekend can be accessed at the WTEA's website. Also feel free to email me directly at mjschult@kUSD.edu.



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FROM THE ARCHIVES

Note: The following article was published in the Winter 1994 issue of the Interface.

Wisconsin Starts Engineering Pilot Program

This past summer four educators from Wisconsin participated in a National Science Foundation Workshop in Stony Brook, New York, that introduced them to a new program in engineering for high school students. The course has been developed in response to national studies which suggest implementation of pre-college courses that survey and stimulate interest in careers associated with engineering and technology. During this one year course, students will explore the relationship between science, technology and engineering. The course is an integrative hands-on laboratory based set of case studies for academically able Junior and Senior students. Participants from the Eau Claire and Appleton school districts have returned home with a complete curriculum and will be piloting this program for the State of Wisconsin during the 1994-95 school year. "Principles of Engineering" is designed to expose students to the important elements associated with all engineering disciplines. The course is an attempt to show students interested in this occupational area case studies that are typical examples of the type of work that an engineer would be involved in. Case stud-

ies include Auto Safety, Machine Automation, Structures, Ergonomics of Communication Technology, Energy Systems and Bio-Medical Technologies. Through the study of these case studies students are exposed to the major engineering concepts of modeling, systems, optimization, technology society interaction, design and ethics. Both pilot schools have chosen to use a team-teaching approach with an instructor from Tech Ed and an instructor from Math and/or Science teaching this curriculum.

Interested instructors who would like to learn more about this exciting new course will have the opportunity during 1994. Dennis Skurulsky, technology education instructor from Eau Claire, will be offering a workshop at the Fond du Lac conference, explaining key elements of the curriculum and sharing activities that are associated with student growth in this area. He will also be offering a week long workshop at the Cray Academy in Chippewa Falls the first week in August. The Cray workshop will give instructors an opportunity to try hands-on activities associated with the course, preview class materials and take home the entire curriculum outline.

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Calculating Your WRS Retirement Benefit: Money Purchase Method or Formula Method

By Doug MacKenzie, Retired Tech Ed Teacher

Note: The author is not an authority nor does he represent the ETF. This information is based upon his understanding from his own experiences and research.

Each year in April you receive from the Wisconsin Employee Trust Fund (ETF) a statement explaining your Wisconsin Retirement System (WRS) account. There is a lot of data on that document, but this article deals only with the last bit of information found at the bottom of page two of your statement. A number is given indicating that this is your current retirement monthly benefit. This may be misunderstood as some people think that this is what they will receive when they retire several years from now. Actually, this number is an estimate of what you would be getting if you had retired last December 31 at the age you actually were at that time. Obviously this number will increase over time with added money in your account each year you continue to teach, your age increases, and your years of experience increases. All three of these factors play important parts in calculating your monthly benefit.

Money Purchase and Formula Methods

When it comes time for the ETF to calculate your monthly benefit, they use both of these methods. The one that gives you the higher benefit is the one that they will actually use. So - why should you care which method they use if you're getting the better of the two? Understanding the difference may help in making decisions regarding your retirement plans.

The Money Purchase method is the easiest to understand. The ETF looks at the total balance of your WRS account and your age at date of retirement. They establish an annuity that will pay you a certain amount every month for the rest of your life. They review this each year and make adjustments based upon changes in your account due to interest gained during the previous calendar year. Your May payment will reflect that change.

The Money Purchase method works out to be best for those people retiring at an older age - perhaps older than 60, and with more years of service - usually at least 35.

The Formula method uses four numbers multiplied together. Interestingly enough, none of these four numbers are related to how much money you have in your account.

The formula is:

$$\text{AMS} \times \text{YofS} \times \text{FM} \times \text{ARF} = \text{Monthly Benefit}$$

AMS stands for Average Monthly Salary. This is your average monthly salary you earned for your three highest salaried calendar years. Typically it is your three most recent years, but isn't necessarily. You may have a year or more where you taught an extra class, or supervised an activity for which you were paid extra money. Also, the three years do not have to be consecutive. At any rate, some teachers take on extra duties during the last few years before retiring simply to raise their average monthly salary for the formula.

YofS stands for Years of Service. This is your total years of teaching in Wisconsin and contributing to your WRS account. There isn't anything you can do to enhance this number other than teaching more years.

FM stands for Formula Multiplier. This number is the same for everyone. It is 0.016 for years of service after January 1, 2000. The years of service prior to 1/1/2000 use a FM of 0.01765.

ARF stands for Age Reduction Factor. If you retire at an age of 57 or older, that number is 1. If you retire between 55 and 57, the number will be less than 1 but greater than 0.9.

For most teachers retirement comes at age 57 or older. Consequently only the first three numbers in the formula are of importance. To get a very rough estimate of your benefit, assume that the AMS is your current salary at the time you will retire. If you multiply 0.016 times your years of service at the time you will retire, you will come up with a decimal number that you can multiply times your AMS. That will be your estimated monthly benefit. For example, 35 years of service times 0.016 equals .56. This is the same as 56% or a little over one half. Multiplying this times your monthly salary means that your monthly benefit in retirement will be close to one half of your current salary at the time you retire.

By teaching beyond age 57 you eventually get to a point where you will get a better monthly benefit using the Money Purchase method. By waiting to retire in your early sixties or later, it is possible to receive a monthly benefit equal to or even greater than your teaching salary at the time of retirement.

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