Interface

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Winter 2014 - 2015

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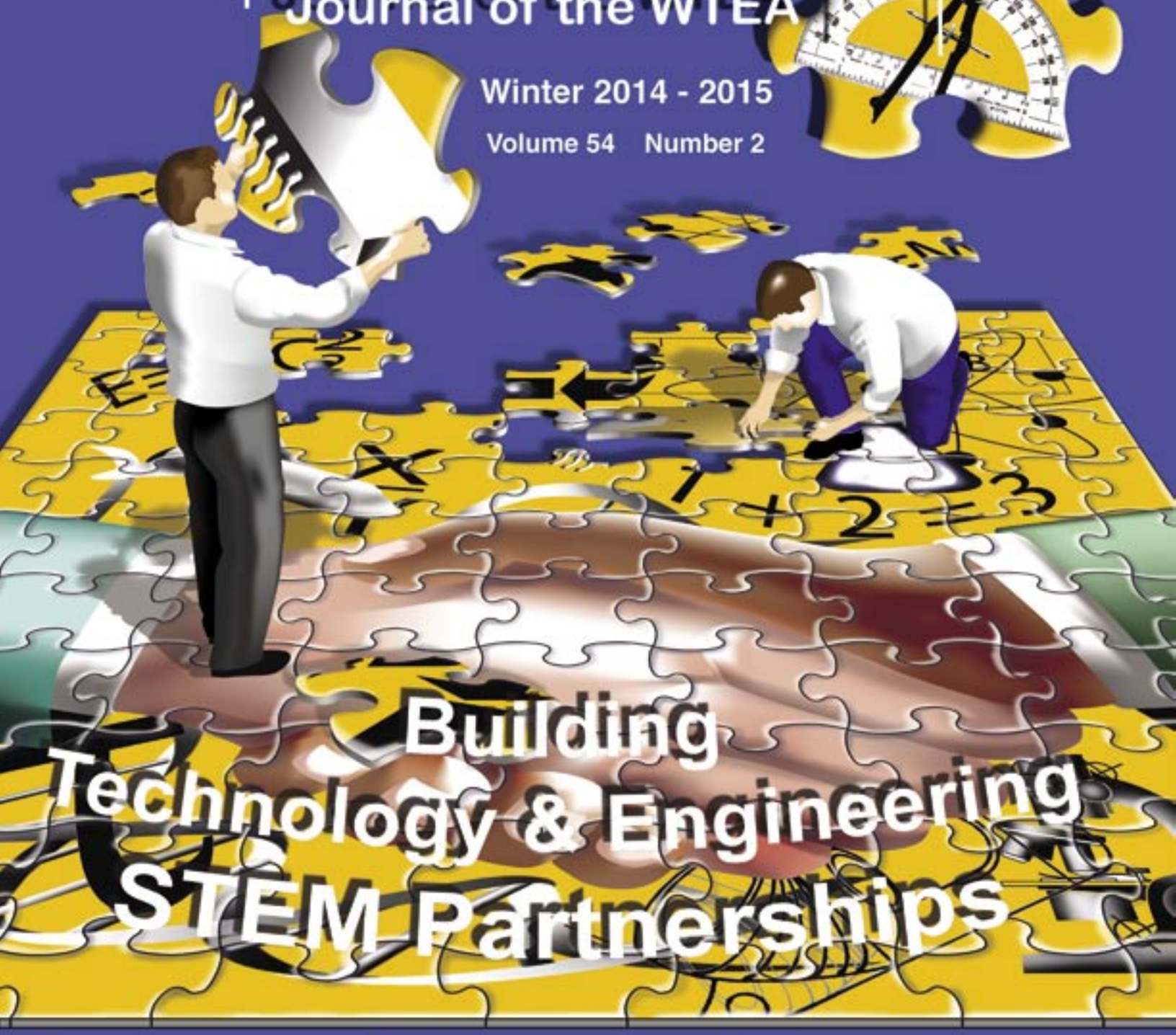

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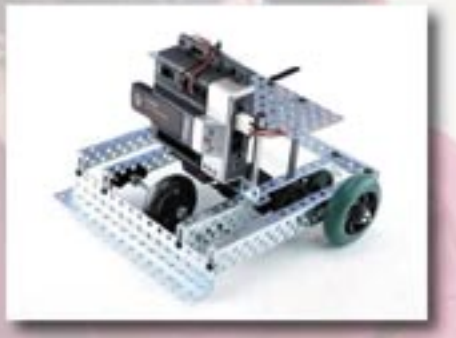

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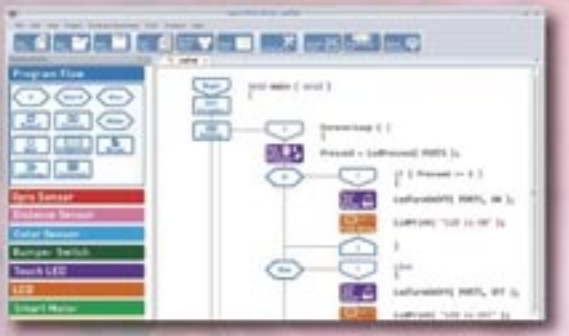

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Overlooking the Valley

By Jesse Domer, WTEA President

What is a teacher? This question has come up a lot in recent months from various angles. I have a strong memory of boating in a Bass Tournament on Lake Mendota years back. It was early fall, cold and windy. I was running west trying to get out of the rolling waves - headed to a protected bay. The waves were getting larger and larger as I continued to slow down, so not to get beat up. The memory I have is at one point I had slowed to the speed of the waves and looked to my side, realizing I was in a valley with the wave tops in front and behind the boat - both higher than me. Long story short - after getting out of there, I was able to finish out the tournament with a decent bag of fish upon finding some calmer water.

Why do I bring this story up? I realize not everyone enjoys fishing - though we continue to find ourselves in the valleys of our profession the past few years. We went into teaching to make a difference, to help kids, to play with cool equipment, to make a living, to follow our parents, or so many other great reasons. And on a daily basis we accomplish great things with our students, community and beyond! However, many days all we see is a valley with walls of paperwork, meetings, bad kids, budget shortfalls, equipment repairs, professional development, license renewal and more time needed than is in the day.

I encourage you to reflect on your career - past, present and future. I encourage you to remember the great moments, the success stories, that dream or vision for what is next. I ask you to network with your colleagues in your school, area or state! Reach out and remind a neighboring Technology & Engineering teacher that you are there for them for whatever they may need. In the dark times of those valleys, the light can come easily from a friendly conversation or greeting. I had the pleasure these past few months to visit with two schools and spend a day each "talking shop" and playing with CNC equipment and robotics. All it takes many times is just offering or asking for help, and making time to gather around a common topic. Both days were successful, sharing of curriculum, talking about what works in our classrooms, learning better how to run equipment, and so much more. Though the biggest success from those visits was remembering we are in this together!

The WTEA has a history of providing support to our teachers and standing up for our profession. We have to take advantage of those opportunities if we are to see them personally. Yes, the WTEA has great District Directors who are trying to have regional meetings. Yes, the WTEA is partnering with DPI to help network in the fall. Yes, the WTEA has a spring convention every year (which I hope everyone has signed up for this year!). BUT have you looked at hosting a "WTEA Hi-Tech Weekend" this spring or summer? Have you nominated a fellow teacher, administrator or program for a WTEA award? Have you participated in the curriculum sharing opportunities with WTEA? Have you submitted a success story or curriculum idea in the quarterly Interface, the Journal of the WTEA? Have you taken advantage of some of the Masters Credit options through WTEA? Have you thought about giving back by running for a WTEA Board position in the future?

In conclusion, my career has continuously been walking through the clear cut forest, going up and down the valleys and peaks, aiming towards large and small goals in the distance. There are many things that can bring me a smile in my classroom - and some of those are networking with my colleagues and the encouragement of the WTEA. To me, a teacher is like many other jobs with heaps of tasks and not enough time. But we get the opportunity in that fog to help today's youth become tomorrow's skilled leaders! Finding a way to refocus our eyes and time on the youth in our classroom is key to successfully navigating those valleys in our profession, one wave at a time.

I look forward to talking with many of you in March at the WTEA/ITEEA Convention in Milwaukee, Wisconsin! Please continue to encourage your students towards a potential career in Technology & Engineering Education.

Jesse Domer

WTEA BOARD NEWS & CALENDAR

Fall 2014 WTEA Board Meeting Highlights

by Matt Schultz, WTEA Secretary/Treasurer

The following summary highlights the Fall 2014 WTEA Board of Directors meeting held via conference call.

- Work to bring back High Tech Weekends - formal or informal. If interested in setting a weekend up at your school contact domerj@watertown.k12.wi.us.
- SkillsUSA Events: State competition moved back to Madison, Wiscosin at Alliant Energy Center.
    - o New three day schedule. April 28th - 30th, 2015.
- WTEA/ITEEA Joint Conference March 25th - 27th at the Milwaukee Hilton Hotel.
    - o $150.00 scholarship for WTEA members. Jan. 10th deadline to submit paper work.
- 2015 Theme to read "Technology & Engineering: Architects of the Future"
- WTEA is working with Senator Darling on Tech-Ed licensure. Contact Jesse Domer if you would like to get involved at domerj@watertown.k12.wi.us.
- Gateway Sumo-bot Competition April 30, 2015. Contact Pat Hoppe to register at hoppep@gtc.edu.
- WEEVA Events Schedule:
    - o UW-Stout: April 17th - 18th (Supermileage only)
    - o FVTC: April 24th - 25th
    - o UW-Platteville: May 1st and 2nd
    - o Road America: May 7th - 8th

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

- Dates to Remember -

January 29-30	**SkillsUSA Regional Competition**	S.W. Tech. College
February 6	**SkillsUSA Regional Competition**	N.C. Tech. College
February 13	**SkillsUSA Regional Competition**	Gateway Tech. College
February 15	**SkillsUSA Membership Final Deadline**	
February 20	**SkillsUSA Regional Competition**	F.V. Tech. College
February 26-27	**SkillsUSA Regional Competition**	UW-Stout
March 25-28	**WTEA/ITEEA Conference**	Milwaukee, WI
March 25	**WTEA Awards Banquet**	Milwaukee, WI
April 15	**WTEA Foundation Scholarship Application Deadline**	
April 28-29	**42nd SkillsUSA State Conference**	Madison, WI
June 22-26	**51st Annual SkillsUSA Championships**	Louisville, KY
October 28-30	**Career Pathways Network National Conference**	Dallas, TX
November 19-22	**ACTE National Conference**	New Orleans, LA
February 25-26, 2016	**47th Annual WTEA Conference**	Wisconsin Dells, WI
March 2-5, 2016	**ITEEA Annual Conference**	Washington, D.C.

ANNOUNCEMENTS

Attention Wisconsin Tech Ed Teachers

There is currently a proposal going through the Wisconsin Senate in regards to potential Flexible Licensure Options for our 220 Technology Education License. The WTEA has been involved in this process and currently stands opposed to this proposal. Please continue to watch the WTEA website, the Tech Ed Listserve and any future Bills out of the Senate in regards to this topic. Your WTEA Executive Board has been actively following this topic and is available if you have any questions or concerns.

- Jesse Domer, WTEA President

WTEA Foundation Scholarship

The WTEA Foundation is offering a $1200 scholarship for a high school senior who commits to pursue a career as a K-12 Technology & Engineering educator.

Eligibility

- Spring 2015 high school graduate
- Wisconsin resident
- Enroll in technology education at UW-Platteville, UW-Stout, or Viterbo University and start the fall 2015 semester
- Submit completed application form and 250 word essay prior to April 15, 2015

Details of the scholarship and the application form can be found on the WTEA Foundation website at www.wteafoundation.org or scan the QR code.

Graduate Credit Opportunity for Conference Attendees

The WTEA has partnered with the Office of Continuing Education at UW-LaCrosse to provide conference attendees an opportunity to earn two graduate credits. Course participants will be expected to attend the annual conference and submit a written document within 30 days of the conference. The registration fee for 2 graduate credits will be $250. Specific course details and registration procedures are available on the WTEA home page. For more information contact Joe Ciontea, WTEA Executive Director.

WTEA - ITEEA Joint Conference

"Building Technology & Engineering STEM Partnerships"

March 25 - 28, 2015 • Wisconsin Center & Milwaukee Hilton Hotel

Wednesday Keynote Address
at Milwaukee Hilton Hotel
Dawn Tabat

Generac
Executive Vice President of Community and External Relations

Thursday Keynote Address
at Wisconsin Center
Nicholas T. Pinchuk

Snap-on Incorporated
Chairman and Chief Executive Officer

Friday Keynote Address
at Wisconsin Center
Margaret A. Williams

Cray, Inc.
Senior Vice President, Research and Development

See pages 14 & 15 for more information

DISTRICT NEWS

District A

Sylvia Tiala

Hi Everyone! Here is a shout out to all of you in northwestern Wisconsin, specifically in the Chippewa Valley Technical College and Wisconsin Indian Head Technical College districts. It is hard to believe that we are almost half way through this school year and lots of exciting things are coming up. I am working with Jeff Sullivan, Dean of Industry, Ag & Energy, of the Chippewa Valley Technical College to set up a spring District A meeting. We are tentatively planning a Wednesday, January 21st meeting starting at 5pm. Keep an eye out on the technology ed listserve or in your email for specific dates and times. Don't forget that this year the WTEA and ITEEA conferences will be held concurrently in Milwaukee on March 25th through the 28th. I will look forward to seeing you there.

Be sure to let me know if you have ideas for local tours, seminars, or professional development activities you would like to see in your neck of the woods. I will do my best to get something going for you. Feel free to contact me at tialas@uwstout.edu or at 715-232-5619. I am looking forward to hearing from you!

District B

Brian Schiltz

ITEEA is returning to Wisconsin for the first time since 1983. The WTEA will be serving as the host state organization for this international event. Our annual state conference will be held concurrently with the international conference, starting Wednesday, March 25, 2015 at the Wisconsin Center and the Milwaukee Hilton Hotel

Teachers and students alike have had great opportunities to participate in various events in the area this past fall. It was great seeing many of you from our district during these events. If you have an event or an article you would like to publish in the Interface and share with the rest of Wisconsin send submissions to me or our editor Doug MacKenzie (doug@wtea-wis.org).

Heavy Metal Tour - In October, for Manufacturing month, Nicolet held its 3rd annual Heavy Metal Tour. The purpose of the event was to introduce the students to the various manufacturing careers and industries found in the northwoods of Wisconsin. Hundreds of students from Arbor Vitae-Woodruff, Crandon, Elcho, Lac du Flambeau, Laona, Mercer, Minocqua-Hazelhurst-Lake Tomahawk, Nativity, Northland Pines, Phelps, Rhinelander, Three Lakes, Tomahawk, and Wabeno participated in the day-long event visiting local businesses. The event was made possible through partnerships with Teri Phalin, (PK-16 coordinator at Nicolet), Grow North Regional Economic Development Corporation, North Central Wisconsin Workforce Development Board and local businesses. A few businesses students toured included: CASE, Northland Stainless, Hypro, Oldenburg, NEX, ABX, Superior Diesel, Northstar Steel, and the welding lab on the Nicolet campus. Each student toured two manufacturing facilities, viewed state-of-the-art technology and acquired knowledge about opportunities in manufacturing careers. In addition, students learned about training opportunities at the Northcentral, Nicolet, and Mid-State Technical Colleges and participated in employer presentations on "Gold Collar Careers." The Gold Collar Careers initiative is a regional effort to inspire students to consider manufacturing career pathways. Many companies in north central Wisconsin offer high tech manufacturing jobs that are pushing the limits of technology. These companies require a skilled workforce that understands and embraces the latest machining, welding, electronic, computer, and other technologies, as well as the application of critical and creative thinking skills to solve problems.

DPI In-service - This fall CESA 9 hosted another DPI-WTEA inservice. Brent Kindred from DPI delved into great points of interest that you can access at the following link. http://te.dpi.wi.gov/te_technology-and-engineering-fall-service-resources.

Check out the WTEA Home Page

www.wtea-wis.org

District C

Tom Barnhart

Over the past few months there has been a lot of progress in Manufacturing due in part to a huge expansion to the Northeast Wisconsin Technical Colleges World Class Manufacturing center.

The 9300-square foot lab, newly configured to more accurately reflect modern manufacturing plants, will be used to train students in NWTC's Machine Tool Operations and CNC Technician programs. The addition of 2650-square feet and more than a dozen pieces of new equipment including five mini mills, seven manual lathes, two surface grinders, six knee mills, a horizontal machining center, and various saws and drill presses were added. There have also been multiple improvements to better accommodate teachers and students through better workspace design that coincidentally make the lab safer.

Last year, more than 150 students enrolled in NWTC's two programs, with another 123 graduating. That's nearly double the number of graduates from 2011, when 66 completed their degree. NWTC Trades & Technologies Dean Mark Weber says the upgraded lab goes a long way towards increasing opportunities for students interested in manufacturing careers, and filling high-demand jobs.

"Demand for CNC Machinists is among the highest of any position in our region," said Weber. "By providing more space for training, new equipment upgrades and through the adoption of new Lean Manufacturing processes, we're able to be even more responsive to the needs of industry, and to the needs of our students."

The CNC lab upgrade was made possible through a Department of Labor grant, with NWTC also allocating funds to retrofit a lab and add equipment.

District G

Travis Ray

I have to admit that as the District G representative I don't feel that I have been doing the best job that I could be. I am not sure where the first year has gone. It sure seems like this one has been unlike no other with regards to just how busy everyone has been.

I am currently working on getting a list together with all current TE teachers throughout District G. That task alone takes a great deal of time with all the moves that have happened throughout the past couple of years. From that list, I will make a contact group so I can effectively communicate with all members within District G.

I am starting to plan a meeting that will occur late January. Please watch for an upcoming email that will list more details.

Dane and Jefferson counties have written and received a grant to start a youth apprenticeship program in construction throughout both counties. The goal is to have 15 students working on jobsites between both counties by the end of the year, and an additional 150 that have gone through the curriculum. NCCER's (National Center for Construction Education and Research) Core Curriculum is being used as the accepted curriculum that will be supporting the youth apprenticeship. As a result, all participating schools sent teachers to receive training and become NCCER certified at Associated Builders and Contractors (ABC) in late August. With all the other youth apprenticeship options that Dane and Jefferson counties have to offer its students this is the first time one has been offered in construction.

I would like to congratulate and thank Oregon High School for hosting a successful District 4 SkillsUSA competition. With the help from the SkillsUSA advisors, Erik Haakenson and Ryan Stace, along with the rest of the department, Nelson Brownell, Nathaniel Lease, and Chris Prahl, and Agricultural Science teacher Jillian Beaty, the competitions were very well run and all involved had a great time. The event involved 198 participants, 181 of which are contestants accompanied by 16 advisors from 14 schools. Once again congratulations to all involved.

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Candidate for WTEA President-Elect

Steve Meyer

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Education and Certification

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- Masters of Science: Technology Education — University of Wisconsin Stout
- Working towards Applied Engineering Degree — Fox Valley Technical College

Professional Experience

- Brillion School District - Elementary, Middle, and High School Technology and Engineering Teacher
- STEMy Stuff L.L.C. - Co-Owner: Science, Technology, Engineering, Math curriculum & product development company
- Ariens Company - College Internship Coordinator/Consultant
- Nekoosa School District - High School Technology and Engineering Teacher
- University of Wisconsin Stout - Adjunct and Summer Class Teacher: Technology Education Department
- National Academy of Science, Washington, DC - National Academy of Engineering Research Assistant

Leadership, Awards and Recognition

- National Engineering Week Foundation, Discover E Educator Award
- Wisconsin Society of Professional Engineers (WSPE) Engineering Teacher of the Year
- International Technology and Engineering Educators Association (ITEEA) Teacher Excellence Recipient
- Wisconsin Technology Education Association (WTEA) Teacher of the Year Recipient
- NEW Manufacturing Alliance Excellence in Manufacturing/Partnership Award Recipient
- Massachusetts Institute of Technology (MIT) Lemelson Excite Award Recipient
- International Technology Education Association (ITEA) Board of Directors 2007 - 2009
- Herb Kohl Educational Foundation Fellowship Award Winner
- Member: International Technology and Engineering Educators Association: ITEEA
- Wisconsin Technology Education Association: WTEA, District Representative (current)
- Fox Valley Technical College "New Technology Teacher of the Year Award"
- Channel 7 "Seven On Our Side" Innovative Teacher Award
- Keynote Speaker, Fon du Lac Business, Industry, Education Conference – Fond du Lac
- Presenter, International Technology and Engineering Educators Association - Florida
- Presenter, National Science Teachers Association STEM Conference – St. Louis
- Presenter, Labor Management Council, American Dream Conferences – Green Bay, Stevens Point
- Presenter, Manufacturing First Expo – Green Bay
- Presenter, Wisconsin Manufacturers Commerce (WMC), Workforce Paradox Conference - Madison

Position Statement

Hello WTEA. It is my honor to run for presidency of this great organization. Previous leaders and members of the WTEA have done an incredible job developing, maintaining, and strengthening our field and association. There is no doubt that it is the strongest state association of its kind across the country . . . something that each of us should be very, very proud of. Jesse Domer has done a great job strengthening our association and providing us with some direction to move forward. It is my goal to work with members of the board to continue to strengthen our ties with industry, encourage new teachers to fill positions in our schools, promote your STEM education programs, and continue to develop what I believe is the most important part of the WTEA . . . RELATIONSHIPS! Happy New Year everyone, have a great second semester and thank you for this opportunity.

Candidate for WTEA Secretary/Treasurer

Matthew J. Schultz

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Education & Certification
Associate Degree: 2005 UW Waukesha
Bachelors Degree: 2009 UW Stout Technology Education 220 license
Masters Degree: 2012 National Louis University

Professional Experience
My name is Matthew J. Schultz and I am a 6th year High School Technology/Engineering Instructor at Lakeview Technology Academy in Pleasant Prairie, Wisconsin. I have been a member of the WTEA since my sophomore year in College in2005, and just finished a three year position as Secretary/Treasurer of the WTEA.

I started at Lakeview Technology Academy in the winter of 2009, and since then have been busy working with a great department to tailor Lakeview into a school that has strong roots in Engineering. Lakeview is a "Choice Engineering School" offered to all of the students of Kenosha Unified. We focus on three main tracks; Mechanical and Biomedical Engineering as well as Information Technology. Lakeview has developed a name for themselves for a small school with a lot to offer. Since I started at Lakeview I have developed a strong Supermileage Vehicle program. We are working on our fourth car and have done well for ourselves. I work hard at partnering with local businesses to align sponsorships and work opportunities for my students.

I am a strong believer in extracurricular clubs. There is never enough time in the school day to cover all of the cool stuff that Technology Education has to offer. Because of that I started an Underwater Robot club, as well as taking on a Sumo Robot Club. These after school clubs offer my students more depth into robotics, a growing curriculum at Lakeview.

Lastly, I am a strong believer in SkillsUSA. With a chapter size of over 25 students and returning from nationals last year with 7 students placing in the top ten, how can I not be? I help out where I can, chairing Model Rocketry and hosting our first district event at our school. It is quite rewarding to see my students taking a leadership role.

Leadership, Awards and Recognition
Last year I was named Kenosha Unified's "Innovative Educator of the Year." I think I was awarded this because I am constantly updating the curriculum at Lakeview. The thought of all of the opportunities I have to teach cool stuff is sometimes overwhelming. I have been blessed at Lakeview to have some of the best equipment a school can offer.

This year I have taken up a mentorship position, working with a non-traditional long term sub in another building in our district. This opportunity has allowed me to share my experience and knowledge with another teacher. It is quite humbling to have that opportunity to help another teacher in the classroom. It has allowed me to reflect on how and what I do in my own class. I look forward to the opportunity to work with other teachers in the future.

Position Statement
Ever since I first attended a WTEA conference as a college sophomore with UW-Stout's TECA Chapter, I have wanted to be involved in the WTEA. It has been a personal goal of mine to work side by side with the some of the greatest educators in the state. I want to help make Technology Education the best subject in school. I want to help tomorrow's workforce succeed.

In my last term I worked to streamline the "WTEA Awards" process. I have worked hand in hand with my committee members to make both the nomination process and nominee process easier for our members. As well, I have worked on dressing up the awards display and presentation at the annual banquet. I will continue to put my efforts towards the WTEA Awards, because I feel it is extremely important to recognize members doing great stuff with their students.

I think the WTEA is a very important factor in my teaching. The opportunity to work with other educators, to write Interface articles and to present at the annual conference has made me a much stronger educator. I love having that opportunity. If elected Secretary/Treasurer, I will work to continue to offer those opportunities to all members.

SkillsUSA District 3 Competition at Pulaski High School

By Matt Link, Pulaski High School SkillsUSA Reporter

On the evening of December 3, 2014, Pulaski High School hosted its first SkillsUSA District 3 Competition. The event was a destination for a total of 88 contestants from 11 schools across the Northeast Wisconsin area, and several spectators. Green Bay Southwest, Green Bay West, Green Bay East, Ashwaubenon High, Bay Port, Peshtigo, Menasha, Kimberly, Freedom, Kewaunee, and, last but not least, Pulaski were all part of the event, and each showed incredible motivation to succeed. The contestants who participated were each involved in one of the many events that evening, which included: Team Problem Solving, Power Equipment Technology, Welding (SMAW and GMAW), Cabinetmaking, Job Interview Skills, Technical Drafting, Architectural Drafting, Advertisement Design, Related Technical Math, and Precision Machining. Each contestant had about two hours to solve the given problem, after which time they were graded on the level of skill shown and/or the effectiveness of their solution.

Winners of the competition were each given a bag containing several small items, and a choice of a box of competition horseshoes or a floating keychain. First place winners also had a choice between a travel mug and a T-shirt. A big thank you to the donators of the prizes, which were: Northeast Wisconsin Technical College (NWTC) for the "goodie bags," Waupaca Foundry for the donation of over 50 boxes of playing horseshoes, and Universal Technical Institute (UTI) for donating the T-Shirts, travel mugs, and a few small prizes included in the aforementioned NWTC "goodie bags."

SkillsUSA has been a proud club at Pulaski High School for over a decade, and it is aimed for the development of career skills of members enrolled in trade, technical, industrial and health occupations programs. As a non-profit organization, SkillsUSA is dependent on donations of funds and materials from the community and its members.

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Write an article for the Interface
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Interface Editor Doug MacKenzie
doug@wtea-wis.org

Engineering EXPO

University of Wisconsin – Madison

Engineering Expo is a three day opportunity to explore science at the College of Engineering (COE) at the University of Wisconsin-Madison. This bi-annual event will be held this coming spring on Thursday, April 16 through Saturday April 18. Guests of all ages will have the opportunity to participate in competitions, attend presentations, and explore a multitude of displays. Organized by engineering students at UW-Madison, Engineering Expo serves to unite students of all ages, industry leaders, UW-Madison faculty, staff, and students, and members of the community. The theme of Engineering Expo is "Creativity in High-gear" which embodies the goal of expo which is to share the rewarding world of engineering and science.

Competitions

Expo 2015 will feature many exciting hands-on competitions that will give students a chance to experience much of what scientists and engineers do on a daily basis. These science based games will inspire students of all ages to use imagination and critical thinking to complete many challenges. Each day, Expo will host two types of competitions: mini competitions and professional competitions. Mini competitions will offer a fun and enlightening atmosphere while taking up minimal amounts of time and no prior preparation. If your school would like an even greater challenge prior to the Expo, there will be a professional competition that requires preparation before attending. This year's professional competition will require students to create a solar powered drag race car. In addition to the mini and professional competitions, Expo 2015 will also host a competition focused solely on robotics. This year's robotics competition will involve students modifying LEGO NXT robots to compete and win a battle! Students will not need to prepare beforehand to compete in the Robotics Competition. Please refer to our website for more information about our competitions and how to get involved.

Presentations

Expo 2015 will also offer presentations by Fortune 500 companies and keynote speakers from on and off campus throughout those three days. All Expo attendees are invited to attend. Speakers from last year's expo include Craig Benson, distinguished professor and Director of Sustainability at the UW, and Faramarz Vakili, Director of WE Conserve, who will give presentations around the concept of "going green". Engineering students and student organizations will also be displaying their engineering projects at Expo to present their ideas and encourage students to pursue majors in science, math, and engineering.

Going Green

We are actively working to reduce our carbon footprint and raise awareness about conservation to others, therefore, we will be expanding our recycling operations, composting, and cutting energy used in order to run this year's Expo. Students will be invited to partake in this effort by participating in green themed games at Expo, and may even win a reusable water bottle, a great source of reducing waste from disposable plastic bottles!

Important Information

Expo will be held from 9:00 AM until 4:00 PM each day. Schools may choose any day to attend, however, target populations for each day are as follows:

Elementary and Middle School Students:
Thursday, April 16th
Middle School and High School Students:
Friday, April 17th
General Public:
Thursday, April 16th– Saturday, April 18th

School registration will begin in November.
Please check Expo out online!

Twitter: @EExpoUWMadison
Facebook: facebook.com/eexpouwmadison
Website: engineeringexpo.wisc.edu

We hope to see you at Engineering Expo 2015!

If you have questions or concerns, please contact:
Carlton Fischer –School Outreach Chair
schools@engineeringexpo.wisc.edu

Engineering Expo 2015 1550ngineering Drive Madison, WI 53706 engineeringexpo.wisc.edu

CONGRATULATIONS

Doug Kugler Receives Juvenile Justice Award

By Carl Faby, Waukesha County Juvenile Justice Center

My name is Carl Faby and I work with Doug Kugler at the Juvenile Center in Waukesha. I know Doug submits articles to the WTEA magazine and I enjoy reading it from time to time. I thought I would write a small article on a recent award he received from the Wisconsin Juvenile Detention Association this past October. The award is called the "Juvenile Justice Award." It is given to an individual for exceptional programing in educating youth in a juvenile detention center in Wisconsin.

Upon Doug's arrival at our center, we began incorporating hands-on technology into our classroom curriculum. Doug currently teaches ten subject areas that we offer students. Students can earn a half credit in Introduction to Technology Education from the Waukesha School District.

In 2013, Doug won a grant for a 3D printer for our juvenile center. The goal for students is to develop some basic design skills and produce a product.

This past year, Doug and I earned another grant for a graphics unit called "Dye Sublimation" where students will create and print a design on special paper, then heat press it onto a visual media such as shirts, coasters, etc.

Our supervisor, Michael Sturdevant, has been very supportive of Doug introducing Technology Education in the classroom. Mr. Sturdevant and I have noticed a change in the students' attitudes and classroom behavior when coming to school.

I have enjoyed working with Doug for the past four years and having him incorporate "hands-on projects" into our curriculum.

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WTEA & ITEEA Joint Conference 2015

Building Technology and Engineering STEM Partnerships

The WTEA invites you to participate in the WTEA & ITEEA Joint Conference at the Milwaukee Hilton, March 25-27, 2015. The conference program is packed with three days of excellent presenters offering a variety of topics to help inspire and motivate each of us. The Wisconsin sectionals and General Session will be on March 25th, so make sure you put that day on your calendars. All WTEA General Session attendees will receive a complimentary box lunch, provided by some of our Wisconsin STEM Partners. Wednesday sessions will be held on the 4th and 5th floors of the Milwaukee Hilton City Center.

This year's conference will again feature some of the top Technology and Engineering Educators throughout Wisconsin sharing their expertise on topics such as: Architectural Integration with Drafting and Engineering, Middle School Manufacturing & Design Utilizing Plastics, an array of Bio-related Activities integrating STEM, Project based learning - Engineering Controlled Chaos, Telecommunications and Home Entertainment Certification for High School, How do you manage teaching a wide range of courses with little space? Small School, Limited Budget, High Enrollment - No Problem, New Teacher Boot Camp, Project Showcase and much more!

On Wednesday, March 25th, the luncheon keynote speaker will be Dawn Tabat, GPS Education Partners, Founder and Chairman of the Board and former Chief Operations Officer, Generac Power Systems. Dawn will be speaking on "The Value of Skilled Training and STEM Education." Currently we face the Wisconsin Paradigm where we have large numbers of unemployed people and yet record numbers of manufacturing and technical positions remaining unfilled. It is projected that this skills gap and talent pipeline will continue to erode at an even faster pace threatening the economy if unchecked. By 2020 tens of thousands rewarding career opportunities may be missed unless we focus on STEM Education and Skill Based training for High School students. Models of immersive, project based learning such as GPS Education Partners provide evocative strategies for the future. GPS Education Partners has more than a decade of success in meeting the needs of students and businesses. This innovative model has been highly praised by the State of Wisconsin Department of Workforce Development for offering solutions to student employability in high tech, high value careers.

On Wednesday evening the WTEA will hold its annual Awards Banquet in the Rumble Banquet Room at The Harley-Davidson Museum®, 401 W. Canal Street, Milwaukee, beginning at 7pm. Plan to attend and honor your colleagues for their educational excellence and contributions to technology education. Banquet tickets are $32 each and include one free admission to the museum (good for 90 days). Tickets must be purchased from the WTEA (online or by mail) before March 1st.

The ITEEA conference kicks off on Thursday, March 26th at the Wisconsin Center (across the street from the-Hilton). The 8am General Session features a keynote address by Nicholas T. Pinchuk, Snap-on Chairman and CEO. The opening session also includes the presentation of the ITEEA Program Excellence awards. The trade show and exhibit hall opens at 11am. Professional development sectional presentations run all afternoon from 1pm to 5pm.

Plan to attend the "Grand Reunion" on Thursday evening from 7-9pm in the Monarch Lounge located in the lobby of the Hilton Hotel. This will be a great opportunity to network and visit with alumni and faculty from UW-Platteville & UW-Stout. The 9am Friday General Session includes the ITEEA Teacher Excellence Awards and a keynote address by Margaret A. Williams, Senior VP of Cray, Inc. Sectional presentations and the exhibt hall will run from 11am to 3pm. A complimentary lunch will be served in the exhibit hall on Friday.

Dont miss the Wisconsin Tailgate Party in the back of the exhibit hall at the end of the afternoon. It will be full of surprises, special guests, and the Snap-on Raffle. Plan to bring your administrator with you to the conference. He or she can attend at no cost if accompanied by a registered technology educator. Details are available online.

We hope to see everyone at this once in a lifetime opportunity for three days of technology and engineering professional development and exhibits. Conference information and registration details can be found on the WTEA website at: www.wtea-wis.org or at www.iteea.org.

- Room Reservations -

The Hilton Milwaukee • 509 W Wisconsin Ave, Milwaukee, WI 53203

The ITEEA conference room block rate is $159 single/double occupancy. Superior King rooms are $189. Hotel tax in Milwaukee is 15.1%, so for budget purposes, the full cost of a single/double room is $189.01. Room block cutoff date is Monday, March 2, 2015. You can make your reservation by phone by calling 414-271-7250 and identifying yourself as an ITEEA conference attendee to receive the conference rate, or go to http://www.iteea.org/Conference/housing.htm and follow the link to make a reservation online.

March 26-28
2015

ITEEA Milwaukee

MILWAUKEE 2015

Building Technology and Engineering STEM Partnerships

The annual ITEEA conference provides an unparalleled opportunity for technology and engineering educators to gain comprehensive professional development and networking experiences. ITEEA members pay a reduced rate to attend and can choose from dozens of interest sessions, workshops, and social events. This is a unique opportunity to learn from and share with other technology and engineering STEM education professionals in a variety of formats.

2015 ITEEA Conference Highlights

Teaching Technology and Engineering STEM Showcase

The Teaching Technology and Engineering STEM Showcase provides an excellent forum to feature an idea, technique, or best practice related to learning activities, marketing materials, career guidance, facility design, program design, assessment methods, equity, or classroom and laboratory management techniques. Showcasers are asked to illustrate a single element of technology or engineering teaching and learning that they feel they have exemplified. Please join us and share your best STEM activity/lesson in Milwaukee!

Complimentary Registration for Administrators

Bring your Administrator at no additional cost (complimentary registration). A special strand of presentations will be offered that are designed for Administrators to build understanding and support for your program!

> The most important benefit that you can get from an association is the ability to contribute to and share with others as well as learn from their experiences. We will continue to work to provide ITEEA members with these important opportunities.

WTEA State Meeting

On Wednesday March 25th (9:00am-5:00pm) Wisconsin teachers and business partners invite you to participate in the annual Wisconsin Technology Education Association (WTEA) Conference. The event includes workshops, seminars, and best practice sharing by fellow technology and engineering teachers. Delivering the Keynote address will be Dawn Tabat, Chief Operating Officer for Generac, Inc. Ms. Tabat's experience in a leading global supply chain, advanced manufacturing, and talent development will inspire you to STEM up your curriculum. Wisconsin's annual teacher excellence award dinner will be held at the Harley Davidson Museum and restaurant. Everyone attending the awards dinner will receive a pass to the Harley Davidson Museum. Come and see "What's Brewing at the WTEA convention."

WI Partnership Displays

The Wisconsin Technology Education Association (WTEA) will be holding its state conference in conjunction with the ITEEA Conference. With that, there will be over 30 Wisconsin STEM Partnership displays showcasing the innovative model of STEM education throughout the state of Wisconsin. These interactive, student-focused partnership exhibits will be on display in the exhibit hall to highlight the benefits of building collaborative relationships.

Something's Brewing in Wisconsin

PreTailgate and Tailgate Events

WTEA will also host both a "PreTailgate" activity (Thursday) and "Tailgate" reception (Friday), bringing to life the cultural experience of attending a Wisconsin sporting event. The entire experience will include games, prizes (including a $33,500 toolkit offered by Snap-on, see page17), refreshments, unique Wisconsin sports memorabilia, and more. And be sure to check out the new Harley Davidson motorcycles on display!

Project Showcase

Join us for the 6th annual *Project Showcase* again this year at the WTEA conference in Milwaukee. This year the showcase will be BIGGER, BETTER, and a little different. We will have a designated room all day on Wednesday to display the projects. We will organize the room into Elementary, Middle, and High School projects. Tables and power will be available. So . . . we are asking that you bring projects that we can display. Bring projects such as cribbage boards, Vex Robots, woodworking items, student poster board displays, electronic circuits, graphic arts and printing projects, CO2 cars, airplanes, 3D CAD drawings, machining projects, welding samples, or even digital pictures of projects. These can be student made projects or samples made by instructors. You are welcome to include supporting curriculum, but it is not required. Watch for more information on the web and the DPI listserve as the time gets closer. Please email Steve Meyer at smeyer@brillionsd.org if you have any questions.

Please consider supporting this activity.

Bring a project to display and be entered to win a prize!

WTEA
Wisconsin Technology Education Association

RAFFLE

This Snap-On Master Metric Mechanic Tool Set Valued AT $33,700 Could Be Yours!

Enter To Win

Support the Future of Technology and Engineering!

All proceeds benefit the WTEA Foundation

Tickets can be purchased Wednesday through Friday at the ITEEA Conference Registration Desk located in the Exhibit Hall, the WTEA Registration Desk located in the Hilton Hotel, and in designated areas on the Exhibit Hall floor (cash only). Tickets cost $10 each. Ticket holders do not have to be present to win. Snap-On will deliver the toolkit prize to the winner's location (within the 48 contiguous United States).

Don't miss this exciting raffle event following lunch (and during the Wisconsin Tailgate) Friday afternoon, March 27, 2015.

Tell us what you would do if you won this incredible prize! Tweet your response to @ITEEA.

To learn more about the WTEA Foundation, go to www.wteafoundation.org.

Ticket purchases are not tax-deductible.

EDITOR'S NOTE

Keeping a Sharp Mind in Retirement

Safety First

As a few of us slowly move through our retirement years, we need to keep ourselves occupied with small projects . . . like this guy.

I know, I saw it right away too. No safety glasses or hearing protection.

And I caught something else that is really important - he has no gloves on.

I might be up in age, but I am still sharp as a tack.

Doug MacKenzie
Interface Editor

Wisconsin STEM
Partners Showcase

Look. Experience. Understand.

Come see What's Brewing at the Wisconsin STEM Partners Showcase.
Experience STEM through interactive exhibits featuring high schools, colleges, business partners and key STEM-related associations.

Understand why Wisconsin leads the way in engineering and technical education.

Visit the Wisconsin STEM Partners Showcase (within the main Expo Hall)

Thursday, March 26 • 11 am - 6 pm
Friday, March 27 • 11 am - 3 pm

The Wisconsin STEM Partners:
Ariens Company
Ahrens Foundation, Ltd.
Associated General Contractors of Wisconsin
Brillion High School
Burlington Area High School
Chippewa Valley Technical College
Cray Incorporated
Fisher Barton Specialty Products
First Technologies
Gateway Technical College
Generac
Goodheart-Willcox
GPS Education Partners
Harley-Davidson Motor Co.
Kenosha Unified School District - Lakeview Technology Academy
Kloss Foundation
LabMidwest
Miller Electric
Milwaukee Bradley Tech High School
Milwaukee School of Engineering
Manufacturing Skills Standards Council (MSSC)
Minnesota Technology & Engineering Association
National Coalition of Certification Centers (NC3)
National Coalition of Advanced Technology Centers (NCATC)

National Occupational Competency Testing Institute
NEW Manufacturing Alliance
Peter Scherrer Group
Plastics Ingenuity
Snap-on Incorporated
Three Lakes Junior and Senior High School
Union Grove High School
University of Wisconsin- Stout
University of Wisconsin- Platteville
University of Wisconsin- Parkside
Watertown High School
Waupaca Foundry
Wisconsin Automobile and Truck Dealers Association
Wisconsin Built
Wisconsin Department of Public Instruction
Wisconsin Energy Efficient Vehicle Association
Wisconsin Manufacturers and Commerce
Wisconsin Technical College System
Wisconsin Technology and Engineering Education Association

WTEA

ITEEA

Ashwaubenon Students Make Smart Cow a Little Smarter

Reprinted with permission from The Green Bay Press Gazette
Written by Daniel Higgins

The blue and pink wooden bovine standing next to the fireplace inside Smart Cow Yogurt Bar at 2321 S. Oneida St., Ashwaubenon, blends in with its environment as naturally as the self serve frozen yogurt machines and colorful toppings. However, this latest addition to the fro-yo shop is more than decoration, it's a Little Free Library (a program that encourages people to borrow and return books at many public locations around the world) that had its roots as an art project at Ashwaubenon High School.

Sophomores Katelyn Huebner and Monet Parrett took their assignment from art teacher Dean Stadel from concept to completion by first making phone calls to Smart Cow headquarters to pitch the idea, get measurements, color schemes and other details. After that it was plenty of on-the-job construction training from technology and engineering teacher Dave Stroud.

"This was a whole new experience for both of us," said Huebner of learning to construct the library and jokes that, "With all the stuff we learned we could very well build a house."

Between phone calls, planning, communication and construction, the project involved about 55 hours of work, Huebner estimates.

Stadel says he didn't expect any students to take their designs this far and was impressed at the initiative to call Smart Cow.

Ashwaubneon High School sophomores Monet Parrett, second from right, and Katelyn Huebner, right, took the initiative to make their art project in Dean Stadel's, second from left, class a reality with help from technology and engineering teacher Dave Stroud, left.

Funds for the materials to build the Little Free Library came in the form of a WPS Innovative Educator Grant of $1,000 procured by Stroud.

"I wanted to collaborate with the art department because in our department, the tech ed department, we look at things very technically where as in the art department everything is very creative. We can get better results when we mix those two elements together," said Stroud. "I don't think we, in my department, would have ever come up with something like this, yet they wouldn't have been able to build something like this. It's a perfect example of how those collaborations and interdisciplinary activities like that can create good products."

Stroud hopes the grant funds will sprout five more libraries around Ashwaubenon. One will soon be set up in the Culver's at 909 Hansen Road, Ashwaubenon and he's meeting with another student to talk about building libraries to be placed at Ashwaubenon schools.

In the meantime, the library at Smart Cow is stuffed with books, spilling over into a small crate nearby, thanks to many donations during Holy Family School's grass roots night Tuesday. Grass roots nights are one way Smart Cow helps generate school funds. To date, the Ashwaubenon location has given more than $29,000 to local schools.

For Huebner and Parrett, the goal was even bigger than raising money for schools.

"Our motivation was picturing the kids reading and spending time with family and just eating frozen yogurt and having a good time."

It didn't take long for that vision to become reality. Rene Hoffmann, manager for the Smart Cow locations in Ashwaubenon and Green Bay, says families were sitting on the couch to read books Tuesday night.

"It's a great way to get people to come together and read books. In the long run, it's reading that helps people learn things," said Huebner.

If you are not receiving
the Technology Educators listserve postings,
you can sign up by contacting
Brent Kindred at: brent.kindred@dpi.wi.gov

ARTICLE

Those Special Students – Helping Years Later

By Travis Ray, McFarland High School

With just over ten years teaching and two years out on my own as a small business owner, I have been taking some time to reflect on my life, my family and my career choices.

There have been days during both careers that I have said "Not another day." The resumé comes out and the mind starts to race about what's next. On the other side, there are days when nothing could be better and I was so glad I went with the choices I had made.

Now that I have been back into teaching for a third year after owning a business, I am beginning to realize why I came back. It's those special students. The really amazing young men and women that excel in class, hang around after school, and show up early. Now don't get me wrong, I enjoy working with all my students, but there is something special about those ones that "get it." The ones that you can see you are truly impacting. I am sure that everyone can identify with the type of students I am talking about. We all have had them, some more than others.

I have stayed in close contact with several over the years. I followed them through college, and I was probably just as excited as they were when they would call about their first job. Recently one of those students called me saying that he was home for Thanksgiving and was wondering if he could stop up to school to see how things were going. Of course I encouraged him to stop by.

He graduated from UW-P with a degree in Manufacturing Technology Management (MTM) and is currently employed at Mercury Marine in Fond du Lac, where he was (since receiving a promotion) a quality control engineer for the casting portion of the company. When he arrived at school, it was the start of my 4th block metals class, so I harnessed the opportunity to have him speak to the students about his college degree, his current job, and the responsibilities that come with it. After his presentation, it was off to the shop. For obvious reasons, he showed particular attention as we got to our foundry area. I gave him a brief explanation of what we do for foundry lessons and projects. He listened and then began to make a list.

The class ended and the kids left. We visited for a bit and then he went on his way. Two days later he called saying he was going to send a form that needed to be filled out so he could donate foundry supplies to the high school from Mercury Marine. He said the list he was making was like a Christmas list. He has talked to his bosses and now I have an amazing amount of supplies, safety gear, and demonstration pieces coming my way.

I was shocked, and said that he did not have to do that. To which he replied "you have no idea how much you meant to me as I was going through high school, and without the classes I took in Technology and Engineering I am not quite sure where I would be in life." He ended with, "It is the least I could do to help you and your department.

I have been in four different districts throughout my teaching career. I have worked in different shops, with different administrations and guidance counselors, and, of course, have had a wide variety of students. I have had good days and bad. We have all been told that we make a difference in students' lives, but I guess I never realized just how much.

This particular student has often joked that he has a job waiting for me. All I need to do is fill out an application. On those bad days, the thought crossed my mind. But with what he has just done for me with regards to the donations, and his comments on how much I meant to him throughout his life, I can only think of one thing: "Who's Next?" I now realize just how important a job we have. Our principal always says "if not us – who, if not now – when." Well, I guess I have to look at myself and my decision to return to the classroom and my renewed dedication to my students as they make choices toward successful futures.

I have never been happier to be a Technology and Engineering Teacher at McFarland High School.

Update Your Engineering Curriculum with an Underwater Robot

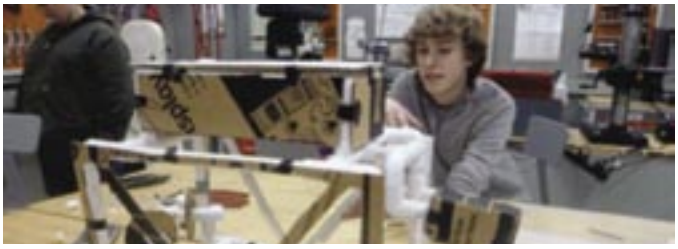
By Matthew Schultz, Lakeview Technical Academy

A few years ago I wrote an article titled "Building an Underwater Robot in your Class for under 100 dollars." I followed up that article with a presentation at the WTEA Spring Conference, where I demonstrated starting an Underwater Robot Club with your students. After much interest was expressed to do a follow up session at this year's joint WTEA/ITEEA conference I decided what the heck, why not.

A lot has happened in the two years since I did the first session. Though my school still offers the afterschool club, and competes in the MATE (http://www.marinetech.org/scoring/) competition in the spring, I am no longer the advisor of the club. I had to make the tough decision as a teacher and advisor of many clubs to let one go, to make time for my new wife. Even though our club is running strong, and I am still able to help out, I yearned to continue using the Underwater Robot as a "vehicle" of teaching in my classes. I decided to tailor the project to work in my PLTW "Principles of Engineering Class"

For those of you that are wondering how could I do that? Don't I have to stick to the standard curriculum? My answer is yes, you do have to stick to the curriculum, and I do. But nowhere does it say I have to use their projects. Once I decided to make this change in the class I spent some of my summer designing the underwater robot project to match the curriculum. This wasn't as easy as I originally thought. Because the curriculum and the robot need to follow a certain order to keep the structure of both the class and the robot, it took some time to make the adjustments so everything would line up.

After much work, and much consulting with my peers, I am ready to run the first attempt at this new joint curriculum. In my first designs of the curriculum I struggled to match every single unit to the robot. Then after much aggravation I decided not every unit needs to correlate. I can still do projects that don't tie into the robot project since there are no rules. Here is an outline of the curriculum and the robot aspects as they align.



Unit 1 Energy and Power

Lesson 1.1 Mechanisms *(design & build the robot frame)*

Lesson 1.2 Energy Sources *(supplying power to the robot, possibly alternative power source)*

Lesson 1.3 Energy Applications *(wiring up the motors, cameras & lights) (thermodynamic themed missions)*

Lesson 1.4 Design Problem

Unit 2 Materials and Structures

Lesson 2.1 Statics

Lesson 2.2 Material Properties *(Frame & body materials)*

Lesson 2.3 Material Testing *(Buoyancy)*

Lesson 2.4 Design Problem

Unit 3 Control Systems

Lesson 3.1 Machine Control *(Arduino microprocessor)*

Lesson 3.2 Fluid Power *(Pneumatic Gripper)*

Lesson 3.3 Design Problem

Unit 4 Statistics and Ballistics

Lesson 4.1 Statistics *(analyzing data from missions tailored by instructor)*

Lesson 4.2 Kinematics *(I thought about the idea of a projectile device on the robot - not sure yet if that could be cool!)*

This is my first attempt at integrating the two curriculums. As usual I am sure I will make some mistakes and decide a better way to do it the next time, but I am excited to bridge the two. At the conference I will be sharing my success as well as what wasn't so successful. I will also be sharing curriculum and giving away material to get your own underwater robot started in your classroom. So please keep my sectional spot open on the first day of the conference, I will be in the first sectional following the opening keynote speaker. Hope to see you there.

ARTICLE

A Sound Idea

by Steve Hoersten, Rice Lake Middle School

Are you looking for a project or unit that gets just about every student in the school beating a path to the door of the engineering lab? Or a unit that has multiple cross-curricular ties? Or even one that can go in so many directions that the possibilities seem endless? Well, here's a sound idea; electric guitars! At the 2014 WTEA conference in Wisconsin Dells, I met Steve Meyer from Brillion High School and talked with him about the guitars his students produced. We discussed the possibility of trying the project at the middle school level and with his encouragement I decided to implement the unit in my eighth grade engineering class.

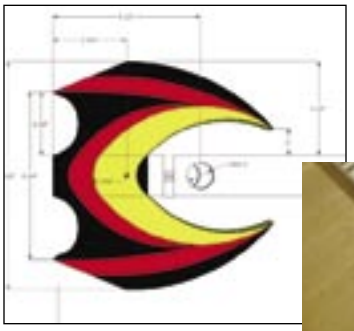
At our middle school, Technology & Engineering is required for both sixth and seventh grade but is an elective at the eighth grade level. Because of this, we try to do some high profile projects at the eighth grade level that will get seventh grade students excited about Technology & Engineering in the eighth grade.

Funding

While talking with Steve, I found out that he and a colleague, science teacher Ryan Peterson, had recently formed a startup called StemyStuff.com and that I could order almost everything needed to create the guitars from them. With budgets being tight, I brainstormed ways that we could implement this unit without taking money away from other areas of the budget. In our district, we have an education foundation that offers grants for new and innovative ideas and I felt that this would be an ideal fit for the grant opportunity. The grant was written making sure to highlight STEM concepts that tied to career opportunities as well as the many cross-curricular connections within this unit. Before long we were informed that the $1700 grant was approved. In the future the cost of this unit will be less since there were upfront costs for Fender Mini-Deluxe Amplifiers, I-rigs (allows an iPad or iPhone to be used as an amp), and jigs/fixtures which will not occur in the future.

3D Modeling

One of the objectives of the guitar unit is for students to produce a product based on drawings they complete using 3D modeling software. While most students used Google SketchUp to complete the guitar drawings, some of the more advanced students were challenged to use SolidWorks to complete the drawings. Because students were introduced to SketchUp in seventh grade, most were able to complete the drawings in 3-4 class periods (42 min/period).



Materials

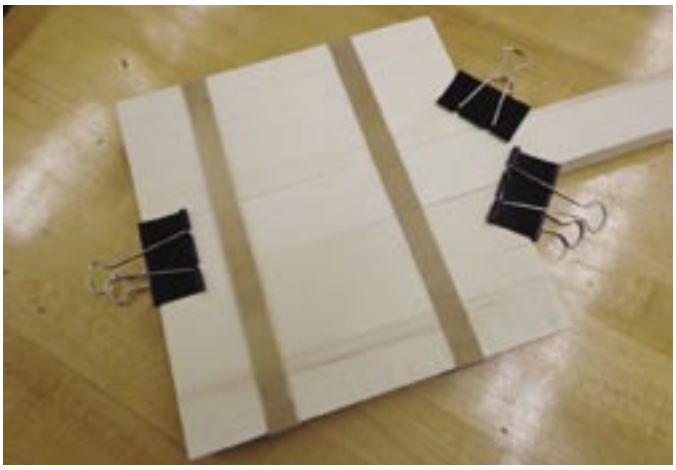
Just about any specie of wood can be used for the guitar. The neck and body for our guitars were made from 4/4 aspen sourced from a local sawmill. Working with StemyStuff.com was excellent as they provided almost all of the hardware, complete instructions for assembly, and a template marking the fret locations on the neck of the guitar. The only materials we had to acquire were wood, glue (wood and hot), solder, spray paint, and fret material. StemyStuff also made a number of suggestions for materials that can be used for the frets. For our guitar frets, we used 1/8" brazing rod from Praxair which students cut on a Beverly sheer using a stop block to cut the correct length. Because the sheer left a bit of a sharp edge on the frets, students used either a flat file or 80 grit sandpaper to soften the ends of the frets.

continued on next page

Machine Work

Students who finished their drawings quickly were asked to help build fixtures for drilling holes and cutting dados for the frets. The fixtures were used only to ensure that material was not wasted by drilling or cutting in the wrong location. A CTE standard addressed in this unit is BB1.b.4.m: Use appropriate tools to measure and layout a piece of material (e.g., length, width, thickness, angles, circles, arcs and volume) within tolerances. As a summative assessment, students completed all layout marks on materials and received teacher approval before machine work started.

Students used a fixture on the table saw to cut dados at the fret locations and then drilled holes for the string and pickup in the neck. Blocks of wood were then edge glued to the neck to form the body. We had to get creative with the glue-up as we didn't have enough clamps to do the job. Our work around was to order some size 107 rubber bands to act as clamps and large butterfly paper clamps to keep the face of the body pieces flush with the face of the neck while the glue dried.



After the glue was set, students used layout tools to draw the body shape they had designed on the computer onto the wood. Various machine tool processes were used to create the body shape students had designed. After finish sanding, each student used spray paint and various masking techniques to get the body graphics they were looking to achieve.

Faraday's Law

One of the main objectives of this unit was for students to gain an understanding of how an electric current is induced in a wire moving near a magnetic field. Students completed "Faraday's Electromagnetic Lab" simulator from PhET Interactive Simulations online to gain a better understanding of Faraday's Law. Students also used a hand cranked generator to light a bulb and were required to write an explanation of the concepts involved. Once students had a basic understanding of how current is induced, we discussed how a guitar pickup works since the wire coil doesn't actually move relative to the magnets position. Through StemyStuff, I was able to find a video that shows how vibrating a steel wire near a magnet actually causes the magnetic field around it to wiggle. The magnetic field wiggles at the same frequency as the note being played and this generates a small amount of current in the pickup coil which leaves through the output jack of the guitar.

Students were instructed in soldering technique and each student was successful in completing the soldering of the pickup coil to the output jack on their first try.

Cross-Collaboration

At the beginning of the year, the Tech/Engineering and Music Departments met to discuss the guitar project. The Music faculty were asked if they would be willing to spend a few class periods with the Technology and Engineering students discussing playing techniques. The band instructors were very enthusiastic about our activity and agreed to the request. StemyStuff provided some music for the guitars such as The Star Spangled Banner, Jingle Bells, and When the Saints Go Marching In. Some of the students practiced the songs and one student even made changes to the songs so that they would sound better on our guitars. When the band director came to class, they had a mini jam session and the results were fantastic. The music faculty has already made suggestions for increasing the collaboration between the Technology/Engineering and Music departments.

The Art department has also expressed some interest in having students use air-brush systems to enhance the painting of the guitar bodies. After hearing about our project, the charter school in our district approached us about collaboration in regards to using their FabLab to produce parts needed for future guitars. This will be another opportunity to help reduce the cost of producing the guitars in the future. There are many more collaborative

tunities yet to be developed for this unit. Disciplines to be targeted for collaboration include: Math, Science, Foreign Language, and Language Arts.

Final Thoughts

One of the toughest obstacles for this unit was finding a place to store all of the guitars after they had been painted. This problem was solved using some rope and two pieces of 8' rebar. The rope was tied to the trusses above the ceiling tiles and the rebar was hung at two levels. The rebar was strong enough to support all the guitars in a class for each period.

In hindsight, there wasn't a need to order four I-rigs that allow students to play the guitar through a phone. In the end, students opted for the mini deluxe amps to play their guitars.

Finally, I've had many seventh grade students tell me they will enroll in Technology & Engineering in eighth grade just so they can have a chance to make the guitars. In the meantime, connections will be strengthened between Math, Science and Engineering to make this an incredible STEM learning event.

If you have questions about this project, you can send inquiries to hoerstens@ricelake.k12.wi.us.

ARTICLE

Prairie River Middle School Teacher Donates Time to Help Kids Build Their Own Canoes

Reprinted with permission from Wausau Daily Herald
Written by Keith Uhlig - Photos by T'xer Zhon Kha

MERRILL — Prairie River Middle School teacher Mark Pugh didn't know what to expect last school year when he started hanging posters around the school, inviting students to participate in a wooden canoe-making workshop.

Mark Pugh tutors Justin Tousignant, 14, in building his wooden canoe at Prairie River Middle School in Merrill.

For the past several summers, Pugh, a technical-education instructor at the school, has been trekking to Brooklin, Maine, to attend courses at the WoodenBoat School, a prestigious program that teaches niche skills related to the art of wooden boat-building and repair. While taking courses, Pugh came down with the wooden-boat bug, a peculiar malady that transforms an otherwise normal person into a special kind of watercraft obsessive.

"I kind of went out there on a whim," Pugh, 54, said. "And I found that I really, really like wooden boats."

The wooden-boat bug is infectious, and Pugh decided that maybe students could catch it, too. So he decided to set up an informal after-school activity, in which he would donate his time and expertise to middle-schoolers who also might be susceptible. He offered space in the school's large wood shop, and all he asked was that students pay for their own materials and be willing to learn and work.

Pugh started it in the 2012-13 school year. Four boys signed up; three finished their canoes last May. One student, Justin Tousignant, 14, now a freshman at Merrill High School, got a late start and still is working on his boat after school, between golf and football and other teen activities.

Pugh helps Chrissy Doering, 13, building her wood canoe.

Chrissy Doering, 13, an eighth-grader at the school, likes to work with wood and tools, so she signed up earlier this school year. Doering's family doesn't have storage room for a wood canoe, so she's building a canoe-shaped wooden shelf for her mother.

"That's a complicated project," Pugh said. "She's learning a lot of the same things the boys did."

Tousignant thinks he might pursue a career in the medical field, but he plans to spend plenty of time on the water, too, as he gets older.

"I like fishing and going around with boats," Tousignant said. "I thought it would be cool to build one."

Pugh uses the most simple, least-expensive canoe-building plans he could find. "The designer calls them 'Six-Hour Canoes,'" Pugh said. "We've found that they take a lot longer than that."

Pugh estimates that Tousignant likely has spent about 70 hours on his canoe and now is nearing the end of the project. He was rounding out the sharp edges on his craft last week, using a small block plane that once was used by Pugh's grandfather — a treasured heirloom for someone who works with wood.

"Take care of that," Pugh advised the teen.

Justin Tousignant sands the wood canoe he's building.

It's appropriate that Pugh would lend out his grandfather's plane. One reason the canoes take so long to build is that they require detail-oriented woodworking, much of it with hand tools used by carpenters and boatwrights for generations.

"The block plane is your friend," Pugh said.

Pugh is teaching the students the practical skills they need to build a boat, including using hand and power tools and making precise measurements. But the deeper lessons they learn come from the simple tedium of much of the work, Pugh said.

The students are being raised in a "need-it-now" society, and building canoes requires patience and determination. But the payoff comes when the students take their boats home.

Tousignant said the project was frustrating at first, but now that he can see the end approaching, "it's a lot easier." For him, final satisfaction will come when he's paddling the boat around.

The wooden-boat bug hasn't bitten Tousignant as hard as it has his teacher. For him, building the boat is an exercise in skill and a chance to build something that he'll be able to use himself. And it's taught him resilience.

But for Pugh, working on a wooden boat is like working on a piece of art. The students' canoes, he said, are made from the least-expensive marine-grade plywood, but the grain will pop through the paint when they're completed. And they'll handle better — flex more — than an aluminum canoe. They'll be more rugged than a carbon fiber boat, which can easily crack if dropped.

"Wood boats, there's just something about them," Pugh said. "A wood motorboat, for example, will handle much better than a stiff aluminum or fiberglass craft."
And then there's pride in the work. "All these nails had to be hammered in," Pugh said, pointing to rows of copper nails lining the top of the canoe. "I made the kids drill pilot holes for each one."

Pugh is finding a different kind of fulfillment from the project. He's nearing retirement — he plans to segue into a new business, building and restoring old wooden boats — and the project has been keeping him fresh as a teacher.

"If I didn't enjoy it, I wouldn't do it," he said. "It's been great for the school and the kids."

ARTICLE

Editor's Note: The following was written to be used as a recruitment tool in the classroom. Please consider presenting this to your students either as a hand-out or in a class discussion.

Who Will Teach the Future?

By Jesse Domer, Watertown High School

Working with students in Technology Education and Engineering is necessary and important. It always has been and I am continuing to work hard to make sure it is in the future. The question is: "Who will teach the future and why is it important?"

There is a population of people who think well when they use their hands and their minds to produce something that can be used. Problem solving skills are second nature to this group because the challenge is fun and exciting. They take pride in providing goods and services to those who depend on their dedication. They continue to look for methods and solutions to make the product the very best. They work together with others to make decisions. I hope that you are a member of this group. My concern lies in who will teach this group in the future?

Are you that person who will dedicate your career to training and educating the future workforce of this state or this country? Will you devote time to developing leadership, training, and educational skills that will bring the next generation of laborers into a strong and vibrant production environment? The crucial truth is that your interest in Technology and Engineering Education qualifies you as a candidate to teach the future. It is your knowledge, training, and passion that will encourage others to get involved. Your school provides many opportunities. There are technical and academic courses you can take to build your knowledge. There are workplace opportunities where employers and teachers work together to teach you important competencies and skills. Student organizations like SkillsUSA provide you with opportunities to compete and develop skills and leadership character.

Wisconsin as a state has a rich and important history in training and retaining Technology and Engineering teachers. Young men and women take this responsibility very seriously. Your willingness to share what you have learned is so important. Who taught you? How long will they be able to continue that role of educating and encouraging young students? If you were to ask them who should continue this strong tradition and educate the future, they would resound in a loud voice that person is YOU! It is you, because you are unique and concerned about the quality we bring to the products this nation provides. You are proud of what you have learned and you are anxious to share those skills in a workplace that respects your training.

Consider the opportunity to be a Technology and Engineering teacher candidate. There are many teacher training institutions in this state that are ready to get you involved with an exciting career. Please talk with your teachers and your friends about this invitation. The shortage of Technology and Engineering teachers that we are currently experiencing is now and will continue in the future to affect the strength of our economy. Your contributions to this profession are needed now. Look at the future and see yourself as a person who appreciates what you have learned and how you can share that with generations to come. We are counting on you and will be behind you 100% of the way!

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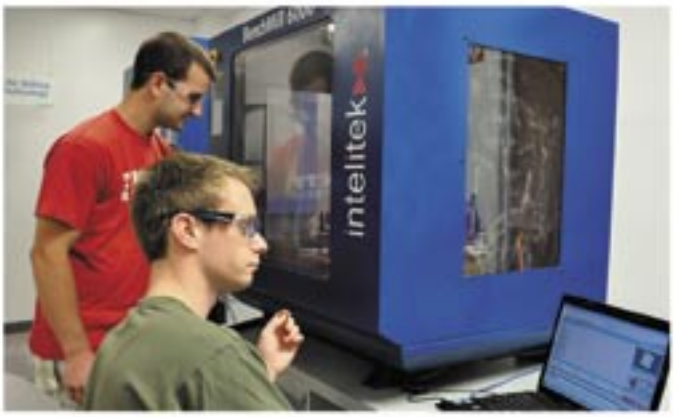

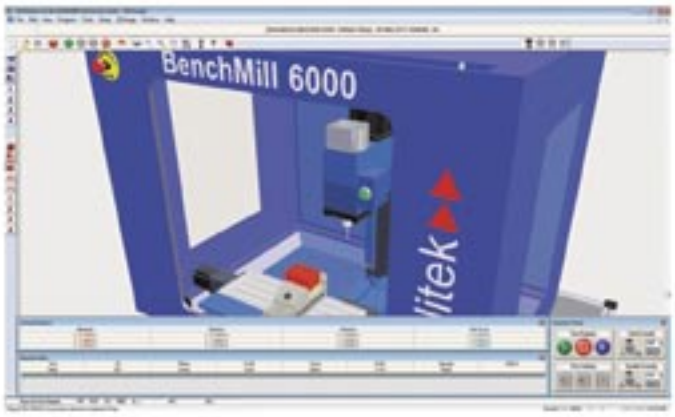

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