

ATEA

American Technical Education Association

Journal



The American Technical Education Association and the National Technical Honor Society jointly awarded the Silver Star of Excellence 2018 to TLD Logistics and Bryd's Automotive.



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Publication guidelines for articles can be obtained at www.ateaonline.org.

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The American Technical Education Association (ATEA) was founded in 1928 and incorporated as a non-profit professional education association in 1960. In 1973 the national headquarters was moved from Delmar, New York to Wahpeton, North Dakota. In 2012 ATEA relocated to the Dunwoody College of Technology, Minneapolis, MN. ATEA is the only autonomous and non-affiliated international association devoted solely to the purposes of postsecondary technical education. ATEA is the leading association for the postsecondary technical educator with emphasis on professional development. Educators and individuals from business and industry come together at conferences to discuss the latest trends and developments in technology. The organization is dedicated to excellence in the quality of postsecondary technical education with emphasis on practical teaching ideas and best practices.

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From the Executive Director and Managing Editor



The ATEA mission includes identifying trends that effect technical education. At the national conference Gateway Technical College delivered on workshops and tours of major employers using robotics, analytics and advanced manufacturing techniques. The keynote by Dr. Dan Phelan spoke of the “unrelenting change” facing community colleges. Keynote Mr. Nick Pinchuk, CEO of Snap-on reached back to the company’s history and the importance and dignity of work and technical education. What also happened

was the ATEA awards for outstanding technical student, faculty, and program as well as a joint award with the National Technical Honor Society of the Silver Star of Excellence award to a business. Winners of the Silver Star exemplify outstanding support of technical education with donations of equipment, training, internships, and placement for graduates. In writing this Journal, I became aware of the qualities that were identified by the nominators and award winners. They were very human, support by faculty, service to the community by students in programs and the connection of technical education and small businesses.

The ATEA cover is of the two Silver Star of Excellence Award winners, TLD Logistics in Crossville, Tennessee and Byrd’s Automotive, Chattanooga, Tennessee. ATEA selected them as co-winners. They each were nominated by their local Tennessee College of Applied Technology, President Al Wightman, TCAT Crossville and Vice President for Technical College of the Chattanooga State Community College, Dr. James Barrott. In his nomination comments, President Wightman commended ATEA for recognizing small businesses. Our ability to see the connections made in towns and cities across America are and will continue to be valued and vital for the American economy and American workforce.

ATEA thanks the Awards Committee for their dedication to the awards program. Nominations for 2019 will open in early September. ATEA’s Region 5 conference hosted by Kansas City Kansas Community College is featured. It includes a Region 5 Presidents’ Roundtable on “How to Find Business Partnerships.” ATEA is returning to Region 1 with a fall conference. Thank you to Dassault Systemes’ Senior Vice President, Al Bunshaft for hosting ATEA. We have invited Region 1 presidents and their designees but it will also be open to ATEA members. Check the ATEA Website for registration information.

This spring we lost Dr. Harry Bowman, a pillar of technical education. He died on April 21. He exemplified academic excellence and precision and a heart that reached out to all with dignity. The 2019 national conference in Indiana, April 3-5, 2019 will be dedicated to him.

We encourage you to stay connected by attending a conference. We welcome your membership and encourage you to nominate a student or colleague for a national award.

Best regards,

Sandra Gehlen Krebsbach
Executive Director

Cover photos

Left photo: TLD Crossville: L-R: Dr. Bryan Albrecht, ATEA Board President; Dr. Harry Bowman, ATEA Board of Trustees; Mr. Al Wightman, President of TCAT Crossville; Michelle Whittenburg and Roger Whittenburg LTD Logistics co-owners

Right photo: L-R, Dr. Bryan Albrecht ATEA, Board President; Dr. Harry Bowman, ATEA Board of Trustees; Clark Pressley, Co-owner Byrd’s Automotive; Mr. Darrell Bolt, District Manager Azko Nobel Chattanooga; Tamara Pressley Co-owner Byrd’s Automotive; Dr. James Barrott, Executive Vice President Technical College, Chattanooga State Community College; Mr. Tim Chastian, Collision Repair Instructor, Technical College, Chattanooga State Community College.

atea president



Dr. Bryan Albrecht
President & CEO Gateway Technical College

I could not be more proud to represent you and the American Technical Education Association. As we celebrated the 4th of July, I could not help but think of the importance of our association. Building the American workforce through technical education and training is at the center of our country's economic success. Exemplifying the dignity of work and honoring the men and women who have built our nation community by community gives us a unique mission and purpose. The weeks following the 4th of July, I will not only respect those that have sacrificed to give us freedom but also those who have dedicated their life's work to educating generations of American's instilling hope, prosperity and liberty, American Technical Education champions.

Respectfully,
Bryan

Past President's Council

ATEA Board instituted a Past Presidents Council which will be part of the ATEA Executive Committee. Past Presidents who are active with ATEA are eligible. The Council is charged with overseeing succession and delivery on the mission. Appointed the Past Presidents Council are:



Dr. Paul Young
President of Northern Wyoming
Community College District
ATEA President 2015-2017
ATEA Past President's Council
2017-2019



Rich Wagner, Ph.D.
President of Dunwoody College of
Technology
ATEA President 2013-2015
ATEA Past President's Council
2017-2019



James King
Executive Vice Chancellor Tennessee
Colleges, TBR
ATEA President 2008-2011
ATEA Past Presidents Council
2017-2019

Reappointment to President of ATEA Regions



Dana Wolf
Instructor Financial Services
Southeast Tech, Sioux Falls SD
Region 5 President
ATEA President of Regions 2015, 2016, 2017
Appointment 2017-2017
Co-Chair Region 5 conference 2015—hosted by
Southeast Tech

Executive Board



1st Vice President ATEA Board of Trustees: Sue G. Smith
 Vice President for Applied Technology and Science, Ivy Tech
 Co-Chair of the ATEA National Conference 2015
 Chair of Plenary Session on Technical Leadership National Conference 2016
 Co-Chair for Region 3 on "Scaling the Workforce" Reno and Sparks NV 2017



2nd Vice President ATEA Board of Trustees: Mary Kaye Bredeson
 Co-Chair for Region 6 on "Scaling the Workforce" Reno and Sparks NV 2017



Bob Wallace
 ATEA Director for Finance
 Retired Tennessee Board of Regents
 Finance Director

The American Technical Education Association is proud to announce the **ATEA President's Appointments to ATEA Board of Trustees**

The ATEA bylaws specify that the president may fill vacancies between board meetings. There were two vacancies on the ATEA Board due to the resignation by Dr. Keith McClanahan in 2017 and the death of Dr. Harry Bowman. The appointees to these openings are:



Cliff Smith, Associate Chief of Facilities Services, Kansas City Kansas Community College, Kansas

Cliff Smith, Associate Chief of Facilities Services with Kansas City Kansas Community College, earned his Bachelor of Science in Industrial Arts degree from University of Nebraska at Kearney and his Master's degree in Technical Education from Pittsburg State University. As a 1987 graduate from Nebraska (Go Big Red!), Cliff came directly to what was then the Area Vocational Technical School (AVTS) in Kansas City, Kansas, as an instructor in auto mechanics and industrial arts for special needs students. He then taught two years of industrial technology at Kansas City, Kansas Public Schools USD 500 and then spent two years as the Job Placement Coordinator at USD 500's Career Learning Center. He eventually returned to AVTS, serving as Job Placement Coordinator for a year before assuming the position of Director of Budget and Finance. In 2010, Cliff took the position of Interim Dean and became the Dean of the Technical Education Center in July 2011. On July 1, 2018, Cliff accepted the promotion to Associate Chief of Facilities Services at KCKCC.



Dr. Lin Zhou, President Bates Technical College, Tacoma, Washington

Dr. Zhou served as Bates Technical College vice president beginning in 2016. She was hired at Bates as the dean of continuing education, apprenticeship and child studies in 2013. Since then, she has served as dean of instruction and executive dean. Prior to Bates, she worked as associate dean of extended learning and director of branch campus and continuing education at Lake Washington Institute of Technology. She holds a Ph.D. in education from Oregon State University, a master's in business administration from City University in Seattle and an associate degree in computer science and networking technology from Lake Washington Institute of Technology. In 2017, Zhou participated in the Harvard University's Institute for Educational Management, administered by the university's Graduate School of Education

Board of Trustees Reappointments



KEN PONTOFF

I have worked in education for the past 20 years, which includes leadership in standards and assessment, curriculum development, project management, and the teaching of writing, literature, and film studies at the university level in the United States and in Shanghai, China. After serving as an instructional designer with the Career and Technical Education Consortium of States (CTECS) for 10 years, I became the Deputy Executive Director of CTECS in 2012. One key leadership skill I greatly value is building new partnerships that are mutually beneficial and that focus on program improvement in the ultimate interest of students and educators.

Since 1973, CTECS has had the pleasure of doing business with 45 states and other strategic partners. Our connections are expansive, ranging from large-scale postsecondary systems such as the Technical College System of Georgia (TCSG), to active new members, such as the State of California's Division of CTE, to vibrant business associations like the Florida Automotive Dealer's Association (FADA).

I whole-heartedly support the mission of ATEA and will do my best to enhance the mission of ATEA, ensuring that the "practical teaching ideas and best practices" of postsecondary education are upheld. ATEA's goals and values are shared and reflected by CTECS, which include the promise to "advocate the value of technical education to society."



JAMES SHERRARD, PH.D.

Jim Sherrard has been a Professor and the Chairman of Nuclear Engineering and Health Physics Technologies Programs at Three Rivers Community College (formally Thames Valley State Technical College) in Norwich, CT for the past 32 years. Dr. Sherrard also has taught undergraduate and graduate courses at the U.S. Coast Guard Academy, Catholic University of America, and the University of Connecticut and is a registered professional engineer (PE). He has served on the Standing Advisory Committee to the Board of Governors for Higher Education in Connecticut and has been its chairman since 1998. He is also a longtime member of the Governor's Nuclear Energy Advisory Council (NEAC) for the state of Connecticut. He is a retired officer from the US Coast Guard with his background primarily in the higher education, engineering, and research &

development fields. Jim received his BS in General Engineering from the US Coast Guard Academy, and has graduate degrees in Nuclear Engineering, Naval Engineering, Mechanical Engineering, Naval Architecture, and Health Physics from MIT, the University of Connecticut, and the Catholic University of America. He has authored two college textbooks and over 185 technical papers. He has been heavily involved in accreditation and assessment with ABET, ACE (both military and credit), COE, NEASC, DEAC, and NCCRS. He has been a Trustee for ATEA since 2009.



DR. BETTY REYNARD

Dr. Betty Reynard has over thirty years of experience in higher education. She began her career in 1979 as a faculty member at Lamar University and moved to Lamar Institute of Technology as a program director and assistant to the Vice President for Academic Affairs. In 2007, she became Lamar Institute of Technology's Vice President for Academic Affairs.

In September 2014 Dr. Reynard was selected to serve as President of Lamar State College Port Arthur. As president she is responsible for providing overall leadership to the college. The major areas of responsibility include academic programs, athletics, finance, library services, student services, physical plant, and workforce training.

Dr. Reynard earned an associate of applied science degree in dental hygiene, a bachelor's degree in secondary education and a master's degree in educational administration from Lamar University. She earned her doctorate in Higher Education from the

University of Houston. She has received numerous honors and awards during her tenure in education.

She volunteers numerous organizations and is a member of several professional organizations. Dr. Reynard was appointed to the Board of Trustees for the American Technical Education Association in 2011.

Dr. Reynard was born in Thunder Bay, Canada. She completed the first 7 years of her education in Canada when her family moved to the United States. She has lived in California, however, most of her adult life was spent living in Texas.



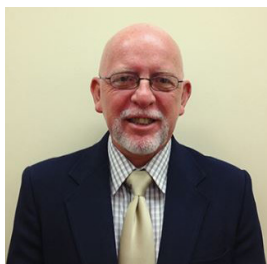
ROGER TADAJEWSKI

Currently, Mr. Tadajewski is the Executive Director of NC3-National Coalition of Certification Centers. This organization target's the advancement of standardized certifications developed in partnership with industry and educational leaders in the transportation, aviation, manufacturing, and energy sectors.

Mr. Tadajewski received his degree in Business at Pepperdine University, The George L. Graziadio School of Business and Management in 1995. His professional experience includes 14 years in metallurgical engineering research and development in both the energy and aerospace industries, he continued on to develop the most comprehensive automotive educational youth program in America -Automotive Youth Educations Systems (AYES). In 2007 he began work on forming the current

NC3 model to bring business, industry and education across multiple sectors to collectively work together. To attract, train and retain current and the emerging workforce in the aviation/aerospace, energy, manufacturing, and transportation industries. These efforts lead to the founding of NC3 in 2009.

Mr. Tadajewski currently resides in Edmond, OK and is currently serving as a board member for the American Technical Education Association (ATEA), US FAB LAB Network, Real World Design Challenge, Partnership for Air-Conditioning, Heating, Refrigeration Accreditation (PAHRA), and NC3-National Coalition of Certification Centers.



BOB WALLACE

Tennessee Board of Regents, Finance Director (retired 2018)



DR. HARRY BOWMAN

Dr. Harry Bowman was reappointed on March 21 and died on April 21. ATEA mourns his passing and is dedicating the 2019 national conference to Dr. Bowman. The atea website www.ateaonline.org has a page dedicated to his memory. Dr. Bowman received the Jean Koch Distinguished Technical Educator Award in 2016. His photo is of his acceptance speech.

student

Outstanding Technical Student Award Winner 2018

Aric Leadabrand, Electronic Systems Technology/Robotics, Lake Area Technical Institute LATI), Watertown, South Dakota

“He embodies leadership, character, and skill of LATI” from a fellow student. Aric received a Build South Dakota Scholarship and a Biomed Avara Internship and a National Aerospace Scholar recipient that included an internship at the National Aeronautics Space Administration (NASA).

Aric commended his instructors at LATI for helping him find the tools to form a new stage of his life after 11 years in the military and 20 years as a nurse. He particularly noted Brooks Jacobsen, Program supervisor and Bob Poor, instructor in Electronic Systems and Robotics.



Outstanding Student Winner, Aric Leadabrand, Electronic Systems Technology/Robotics, Lake Area Technical Institute LATI), Watertown, South Dakota



L-R ATEA President, Dr. Bryan Albrecht, Outstanding Student Winner, Aric Leadabrand, Electronic Systems Technology/Robotics, Lake Area Technical Institute, and ATEA Awards Nomination Chair, Brooks Jacobsen.

ATEA 2018 Outstanding Technical Teacher

*Brent Heusinkveld, Diesel Instructor, Technical Programs Coordinator and Division Chair
Gillette College, Gillette, Wyoming*

A quote from his dean, "He selflessly provides his time, energy and knowledge to the betterment of students, fellow faculty members, the program and the institution. And a quote from Brent," I believe the single most important activity we are doing with our students today is the instructors are now advisors"



Brent Heusinkveld, ATEA Outstanding Teacher Award Diesel Instructor, Technical Programs Coordinator and Division Chair—Acceptance Speech

Brent spoke about his career teaching the past 38 years and all the people he would like to thank. One person is his wife who has been his greatest cheerleader and that he appreciated her support. Dr. Paul Young, President of Northern Wyoming Community College District, is an outstanding president to work with. He thanked Paul for giving him direction and positive attitude has been a great thing. He thanked Travis Grubb, a mentee in the diesel program, who teaches at Gillette College. Watching the success of students is one of the key reasons for teaching.

SkillsUSA is one of Brent's passions. He worked on Wyoming becoming a chartered state that ranks as one of his biggest accomplishments.



L-R ATEA President Bryan Albrecht, President of Gateway Technical College WI, Brent Heusinkveld Outstanding Teacher 2018, Gillette College, Gillette WY and Brooks Jacobsen, Chair of the ATEA Awards Committee and Supervisor of Robotics and Electronic Systems, Lake Area Technical Institute, S D.

ATEA 2018 Outstanding Technical Teacher Finalists



Bo Johnson, Precision Machining Technology Instructor, Copiah-Lincoln Community College, Wesson, Mississippi. A student wrote "He encourages me to dedicate myself to my classes and my life opportunities."



Donna Hanks, Business Management Instructor, Western Dakota Technical Institute, Rapid City, South Dakota. Donna was nominated for her leadership and guidance of students' academic and personal success.



Houston Graham, HVAC technician instructor, Tennessee College of Applied Technology, Chattanooga. A fellow instructor wrote, "Critical thinking is difficult to teach, but Houston manage to do it." Houston asks students at the end of class if they did not learn, than to stay behind and "I will fix that."

Outstanding Program Award Winner 2018

*HVAC Refrigeration Technician Program,
Tennessee College of Applied Technology, Chattanooga*

The program received state level of excellence for student outcomes and placement. The students regularly perform routine maintenance for people who need assistance in the community. “We are proud of our students, we could not do it without them. We do everything that we can to make the program the best possible experience for them, and the community at large, and yes we very much appreciate this award. Thank you.” - Kyle Lee, Instructor HVAC TCAT Chattanooga TN

The instructors: Houston Graham and Kyle Lee.



Nominations for 2019 ATEA National Awards

In early September the ATEA Board of Trustees will invite ATEA members to nominate an outstanding student, faculty, and/or program and business for recognition at the 2019 National conference April 3-5 in Indianapolis, IN. The forms will be emailed to all members and will be available on the ATEA website, www.ateaonline.org.

The nominations are due Tuesday December 4, 2017 by midnight via email and postmarked if mailed hard copy. Details will be included in the nomination packets.

We encourage you to review the criteria and to take the time and effort to nominate. The nominees will appreciate the recognition. All nominees meeting the criteria receive a certificate to be awarded by the president of your college

Silver Star of Excellence Award Winners 2018

TLD Logistics & Bryd's Automotive

Dr. Harry Bowman, ATEA Board member introducing the Silver Star of Excellence Award

The Silver Star of Excellence Award is jointly presented by the American Technical Education Association and the National Technical Honor Society as a joint venture. ATEA was approached by Allen Powell, Executive Director of NTHS to jointly award a business meeting a set of criteria that supports technical education.

The award typically goes to a single institution, however, this year we had two really outstanding nominations worthy of the award. We could not decide between the two so decided to award both. As a member of the (Awards) Committee, I don't think you can blame me for being biased, although I am from the State of Tennessee. I am a Peabody Vanderbilt graduate, for a number of years I headed the accrediting agency that accredits the two schools that are receiving the award. Both of them institutions in the Tennessee College of Applied Technology System, so they have that in common between them. I am going to introduce the president of each institution who will be at liberty to make remarks about the nominees and then invite the nominees to the podium for their remarks.

TLD Logistics

The first recipient is TLD Logistics, nominated by the Tennessee College of Applied Technology at Crossville whose commercial trucking program supports TLD. President Clifford Wightman will make the presentation.



L-R ATEA President of Board of Trustees, Bryan Albrecht; Dr. Harry Bowman ATEA Board of Trustee; Cliff Wightman, President, Tennessee College of Applied Technology, Crossville; Award winners, Michelle Whittenburg TLD Logistics, and Roger Whittenburg, TLD Logistics.

Cliff Wightman, President of Tennessee College of Applied Technology, Crossville Tennessee.



Clifford Wightman

I have been coming to ATEA conferences for many years and the one thing that is always common is it that "you don't see is the group thing." There are all these different ideas which will help education to survive and make our students progress. With ATEA there are the big donors and associations but ATEA also allows us to not only recognize instructors and students but also smaller companies that make what we do work. The Tennessee Colleges of Applied Technology are well funded but all program can always use more. In our part of Tennessee, we are in a strategic area, right along Interstate 40 which may be the second longest Interstate in the country. We have a lot of distribution centers so TCAT Crossville wanted to get into commercial truck driving. When you start pricing trucks, they are \$150,000 and higher, and the instructors and the benefit costs, generally needing to have two trucks, one for the training on the yard and one for the pre-trips. It gets to be a very expensive program. Crossville was fortunate in that TLD opened a terminal in the area. They approached us to be part of this venture.

The "T" in TLD is Toyota. We knew Toyota had it figured out. So when we met with Roger Wittenberg, the Operations Manager, who you will meet, and is wife Michelle Wittenberg, who you will also meet, both are down to earth and had been on the truck driving side of the world and moved to the "white collar" side of it we could work it out to meet the needs for expanding truck

drivers in our area. We came together in informal meetings, everything came together, and they knew how to do it. They already had several of their own truck driving schools, but had never crossed over to the education realm as they did with us.

We had to explain how things worked with the Board of Regents and also the Council for Occupational Education, COE that accredits the TCATS. The finances are important as everyone knows. TCAT Crossville pays them for clerical fees for student management, and COE fees. They have two trucks tied up right now two new trucks are not moving freight, they are used for training our students. We employ their people but they pay them to teach. (?).

This agreement also includes the City of Crossville. We needed a training lot. There was an industrial park waiting for development. The city said “You all use it as long as you need. We will let you know if some industry comes into the door and you need to vacate it. We will help you find another spot.”

We are five years later and we have almost 400 students. TLD has supported the program without regard for who gets the students. Their interest is growing commercial trucking and helping the students get jobs. The home office in Japan, loved this program.

Michelle Whittenberg, TLD



Michelle Whittenberg, TLD Logistics, Crossville, Tennessee, acceptance speech

“I am proud of our working relationship with TCAT Crossville and “yes” we would like to get the majority of students but what is more important, there is a huge shortage of drivers in the trucking industry and we are trying to fill that niche. It has

been a wonderful experience to work with the TCAT and it is has been beneficial to work with everyone.

Byrd's Automotive Company

Dr. Harry Bowman, ATEA Board of Trustee and member of the ATEA Awards Committee

Byrd's Automotive Company, nominated by TCAT Chattanooga for their interest in the Collision Repair Technology Program. Dr. James Barrott, TCAT Chattanooga will introduce the nominee.

Dr. James Barrott, Executive Vice President of Technical College, Chattanooga State Community College



Dr. James Barrott introducing the finalists.

Dr. Barrott congratulated Wisconsin on its commitment to technical education” The best success for a technical program is when you have a great advisory committee especially when there is one company that is an outstanding leader. Byrd's Automotive has been such a leader for the past 5 or 6 years. “

Byrd's Automotive has supported the Allison Repair Program at Chattanooga for the past five or six years. They have donated equipment, helped to improve the facility, helped with training, and provided apprenticeships for students. They have an impact on technical training by providing resources for training. They have spent an enormous amount of time and resources on the collision repair program. They know to have the best technicians it takes training.

“I would like to invite Clark Pressley and his wife Tamara Pressley, co-owners of Byrd's Automotive to come forward to accept the award and to make a few remarks.

I would also like to ask Darrell Bolt, District Sales Manager for Akzo Nobel. I am also going to invite Tim Chastian faculty in

the program. Six years ago when we hired Tim, the program was in disarray, he made a significant change, “as you know in technical programs, if you hire the right person, it makes all the difference in the world.” Tim is an outstanding faculty person who has built and nurtured this program to be one of kind in collision repair.

Clark Pressley, Co-Owner of Byrd's Automotive



Jimmy Bryd and I started the program in 1988, so this is our 30th Anniversary. It is hard for a small business to stay in business for 30 years. There is a lot of consolidation in our industry. We knew when we started to hire the right people, provide good service and good products we might be able to succeed for a long time. Ken Meredith, is the main reason for the success with the school.



L-R; Tim Chastain, Instructor Collision Repair; Darrell Bolt, District Manager, Akzo Nobel, Southeast United States; Tamara Pressley Byrd's Automotive, co-owner; Clark Pressley Byrd's Automotive, co-owner; Dr. James Barrott, Executive Vice President Technical College, Chattanooga State Community College.

Dr. Harry Bowman, ATEA Board of Trustee and Award Committee- closed the awards with this comment.

“We usually have only one recipient, but it’s not unheard of that we have co-winners. It is rare, but this is one of those rare years, two outstanding nominations among the nominees, and let’s give them a round of applause.”

Dr. Bowman passed away a month later, April 21, 2018 we are honored to have his presentation on tape and able to have a transcript of this words.

ATEA National Conference "Racing to Industry 4.0"

Hosted by Ivy Tech Community College
Indianapolis, April 3-5, 2019

Call for proposals is open, please contact:

ATEA office, info@ateasonline.org for proposal form, also available on ATEA website <http://www.ateasonline.org>





DR. MORNA FOY

President of the Wisconsin Technical College System

Wisconsin has a long history of support for and respect for technical education and technical careers and pleased that ATEA is in Wisconsin to celebrate its 90th year.

Every day you are explaining to human beings how the world of technology is changing. There is trepidation about what technology is doing and where it is taking us, and we need translators. We need translators to get young people and people like me more comfortable, more familiar and wanting to embrace that new world of technology, and that is on you. You are going to be our translators and the ones who really lead us in to the next great iteration of humankind, and so I applaud you.”



HONORABLE REBECCA KLEEFISCH

Wisconsin Lt Governor

“We are friends in Wisconsin, because we work hard as a team first, do economic development, and then then once those jobs become opportunities that have been created, we work hard at workforce development. We sincerely appreciate our Wisconsin technical colleges system. Here in Wisconsin what our technical colleges do is tackle a very unique challenge that we foresaw 7 years ago but actually came to fruition in the past six months...3% unemployment and wages up 2.2%. She noted that the Wisconsin Department of Workforce Development showed 95,000 job postings in Wisconsin and bordering Wisconsin and 48,000 resumes. The technical colleges in Wisconsin will help

to fill this gap by “digging deeper into their K-12 relationships, and reaching into the university system to build relationships in order to produce what we believe will be the most educated, ethical workforce in the entire United States of America.”

Last year Wisconsin high school students earned \$20M in college credits through dual enrollment and advanced placement classes. Wisconsin is investing deep into k-12 with academic and career planning 6th grade through 12th grade and with two-plus-two programs to move from technical colleges to universities. We want to make sure that we supply Foxconn and everyone in Wisconsin with the type of bright worker they need and technical colleges perform in their relationships with our employers.

Our technical college in Wisconsin do an extraordinary job and that is why you see so many employers investing in our technical colleges. Just before coming here I got an email from an employer who wanted me to recommend to Brian (Albrecht, President of Gateway Technical College) that he start a IT as a partnership between Leeward Business Advisors or C-Workforce Solutions, Gateway Technical College, Racine YMCA, and Higher Expectations to provide 18-24 year olds with about a 16 week course. Ultimately they earn 5 credits from Gateway at the same time these young workers are being paid for an internship. They end up going directly into industry, but the amazing thing is the sheer number of partners.

“Ladies and gentleman, thank you so much for caring about technical education. Thank you for coming to Wisconsin and investing in the future of our workforce in America.



KEITH SIMPSON

FESTO, National Education Director

FESTO was a gold sponsor at the 2018 national conference. Mr. Keith Simpson spoke for the company. FESTO is now the largest provider of technical training after having acquired Lab-Volt in 2014. They cover foundation skills from high school to military and research level. Everything from the basic electronic systems with curriculum and hardware and simulations, through to advanced equipment in industry and manufacturing and advanced manufacturing and Industry 4.0. They hold train the trainer events.

Through their STEM initiative they are developing a range of solutions to cover education of STEM technology and STEM programs in high schools. Industry needs students to get into the workforce who are not just “page turners” but also able to improvise, to be able to trouble shoot and fill many

skill sets, but parents need to be educated as well. The manufacturing floor looks more like a NASA Center with virtual reality and augmented reality, remote troubleshooting services, autonomous vehicles providing parts “just in time.” So we are in the middle of the fourth generation a change to smart manufacturing, not the standardized processes that are not connected. Educators know more than industry about Industry 4.0. Industry knows it needs to move to the internet of things and the industry internet of things but they do not know how to.



WINNE TU

Human Resources, Foxconn Technologies Inc.

Winnie moved to Wisconsin from Austin, Texas. She likes the generous and friendly people and the historical aspect of Milwaukee. She lived in Taipei, Taiwan and went to Ohio State University and worked for Foxconn for the past 20 years. She has traveled around the world and visited many colleges but the American technical colleges impress her. They are working with Gateway Technical College on Industry 4.0 program. They have a signed support letter between Foxconn and Gateway Technical College. Foxconn will bring in talent from around the state, the region, the country and the world. There will be a need for automation technicians and advanced manufacturing technician which they will rely on Gateway Technical College.

Foxconn started in 1974. They have 1million employees all over the world.

Our founder Terry Gau, is a strong supporter of the transformation of the company to industrial internet of the things. We are not looking for just one set of talents, Research and Development, engineering, sales and marketing, and automation. We are looking for a wide range of skill sets, from the technical college, local college, regional colleges, and national technical colleges.

We want to stress our commitment to Wisconsin. We selected Wisconsin because of its strong support of the technical college system, the education system, the people, the culture, work ethic and ethics. We will build a 1000 acre campus to produce the LCD panel. Our Wisconsin campus will be a center of excellence, for research and development in advanced manufacturing, Artificial Intelligence, Internet technology, Big Data. When I talk with students about the jobs we have they ask, “Can I introduce my father my mother, and my sister?” And I say, “Sure, welcome, I’m happy that you are here, and you want your whole family to work for Foxconn.”

I am asked about recruiting and hiring, you are in the right direction. We will be hiring from the technical colleges. That is for sure.

Lastly, I closing, on behalf of Foxconn, I would like to extend my appreciation and congratulations on the association’s 90th anniversary and it is my honor to be here, and look forward to a long-term partnership with all of you.

ATEA Keynote Presentation

Dr. Daniel Phelan, President and CEO, Jackson College



(excerpts from the transcript of the keynote)

Let me offer some things that I believe are coming in our direction. I will submit to you that we are being told right now what industry is asking for and we're not delivering, largely, and so they're creating their own universities. They're creating their own methods for training and education of their employees because we're not delivering in a timely way with a method and time that makes sense for them. They're doing it on their own. We're becoming less and less relevant to more and more organizations and individuals.

I would submit to you that we are understanding now from our public that credit really doesn't matter. In fact, this...this crazy bifurcation we have is a false dichotomy of credit and non-credit. I believe that our business community, our employer community, is saying it doesn't matter. What I care about is competency. That would require that we rethink the notion of a transcript generally and think about a competency transcript. Oh, it will be bigger. It will have lots of competencies in it, but don't you want to know who's working for you? Who's bringing the skills ability? So then, once you get the skills and ability, then what you need to focus on is who's the person in front of me, what is the manner of their character? What is their work ethic? What is their commitment to my organization? And we will have to work with organizations like the Higher Learning Commission for this region. We have to work with the US Department of Education to be able to say, we've got to disrupt this thinking as Clayton Christensen talks about. We've got to disrupt all of this and think about how I get federal financial aid when it's for competency-based education, not college credit. We've been trying to fit square pegs in round holes for long enough, are you tired of it? I am. Let's stop the madness. Let's have some conversation about changing this.

You know, with the notion of innovation, there's really, there's two strategies. One is incremental innovation where you're making these modest changes all the way along, and then there's the big disruptive stuff like changing federal financial aid. And you know what, there are some people who've already done this. Right? Southern New Hampshire University has already done this, Western Governor's University has already done it. These are private for profit organizations. What are we waiting for? It's incumbent on us, let's not wait for somebody else to do that work. We are the toilers in the field. We have to give

them our experience and knowledge so that the lawmakers can have a solution and a system that makes sense for us. It's important work that we've got to do. And who do we do it for? We do it for the people that we serve.

Kaizen, the Japanese word just means "grow to be better, try to be better". Incrementalism, that's just as much innovation as the big thing, you know? You've got to do this through the lens of the customer. If you don't like that word, get over it. I'm talking about the person who's paying you, providing commerce, for you to provide a service.

I would encourage you to hold focus groups of your students, of employers. We do that if you're getting a Perkins grant, having some subcommittees. Take a student to lunch and just say, tell me what's going on with you? Where are the issues, what are the problems you are facing, how can I help you? Paying attention, being hypervigilant at the individual customer level and at the big horizon level.

The last part is about risk. Risk is everywhere. Are you willing to do what's necessary to advance innovation? Because risk is part of that equation. Everything worth doing is worth risking for. Risking something for something better.

So for us to be successful I think in the long-term is that we have to do our part for providing an environment that...that allows for integrated innovation, that is safer and easier for our employees to come forward to us and offer new ideas, new perspectives, no matter how incremental, no matter how ill-formed, using those as opportunities to say yeah, let us, let us risk together, let us try together. You know, some organizations actually provide opportunities for their employees to actually do experimentation, 3M, one state over, 15% of every employee's work life is given to allowing them to just go try stuff, go through some spaghetti at the wall and see what sticks. That's how Post-It notes were created, in truth. Just by trying stuff and experimenting.

The most important thing is that this reinvention business is a lifelong business. I promise you, I promise you, there is someone out there thinking about how they're going to Netflix us, how they're going to Amazon us. And you may not like what they're doing, you may say "unfair", but in this competitive marketplace, there's no room for monopolies anymore and higher education's monopoly is over. It is over. So it's up to us, it's up to us.

Now there are great organizations like ATEA, AACC, and others that are committed to providing a professional development opportunity for you to have a mindset of the innovator, of the inventor, of the change agent. I thank you for the opportunity to come and spend some time with you. (Applause)

ATEA Panel on Pathway Partnerships



Photo L-R
Al Bunshaft,
Dr. Bob Meyers,
Clark Coco, and
Dr. Beth Ormseth.
Moderator Stacie
Riley, Vice President
of Student Services
and Enrollment
Management,
Gateway Technical
College

EMCEE: It is now my pleasure to introduce our esteemed panel members to all of you. First, we have Dr. Beth Ormseth who serves as the principal of Lakeview Technology Academy.

Clark Coco currently serves as Dean of Washburn University Institute of Technology, or Washburn Tech, in Topeka, Kansas.

Dr. Bob Meyer serves as the Chancellor of the University of Wisconsin – Stout.

Al Bunshaft is the Senior Vice-President of Dassault Systems Americas Corporation where he spearheads key strategic initiatives and corporate leadership programs.

So we will start with Beth. Beth, as a high school principal, what benefits do you see Pathways providing for your teachers, curriculum, and students?

BETH O: Pathways are the foundation of our recruitment. When we are recruiting 8th graders within our system, we are out there explaining our pathways that we have in IT, in biotechnology, in engineering manufacturing, so that becomes a realistic way and a way to recruit students. We are a school of 400 and our wait list is probably over 300 waiting to get in. Pathways allow a high school to have a more consistent schedule because the capstone courses are taught by faculty from the technical college. So to allow a high school to know that that's going to be a stable aspect within their schedule is helpful. It also allows the curriculum to be a little more nimble so by having a technical college run their curriculum with their

instructor, it allows K-12 to stay more on the cutting edge. One of the things we struggle with is finding certified tech teachers so by having a focused path, it allows staff to have more stability in their schedule, which then would increase retention and also allow us to recruit, because this would be your area of expertise. I think it helps students kind of understand that they think they know what they want. It exposes all students to this type of pathway or this type of track that they're going to be on, so students who had never crossed their mind that maybe they wanted to go into manufacturing, see the cool projects, hear the kids talking and allows exposure to everybody, therefore allowing them to kind of shift into that pathway as they get older. So those are the highlights of K-12.

EMCEE: Thank you, Beth. Clark, the next question is for you. You have had remarkable enrollment growth during a time when many schools are experiencing declining enrollment. How have you used pathways and industry credentials as a way to engage students?

CLARK C: There is tremendous amount of economic power right here today, if you stop and think about it, students that graduate from your programs and then they enter the workforce. And so anyway, how did we change? If you don't know me well, I, I'm an old coach and by the way, the Wildcats are playing tonight at 7:30, 8:00 if you want to watch them, okay? That's K State Wildcats. Brian made me wear the hat.

If you don't know the purpose of the hat, is five years ago, we created something very special which was National Technical Letter of Intent Signing Day, and we have a

saying at our place called "Hope Has a Face" and that's every student who walks up our sidewalk. We do not turn any student away from our institution. No matter what your level of ability is. Because they don't come to us in a simple way, where are they going? Right? The other thing in our conference center, Snap-On knows this, I think, and if they don't they will real soon, we stole their banner that says "We Celebrate the Dignity of Work". But the truth is, the other banner that we have in our conference center, which is just as powerful and what I believe is this, is that "We Take No Second Seats." And so what we do, we sit down with our students and we talk about this. And I tell my students this, yes, you're right, I have a son that served in Iraq in '06 and picked up a purple heart, and what I tell our students is very simply this. If we're going to war, I'm taking tech students because I know what you'll do, I know who you are. And you'll be there.

How did we grow? We got engaged with our at high schools, obviously, we started with 16 high schools six years ago, and we got 34 high schools sending students. And it truly was that personal touch of which you do, too. And it was a concept that we value you for everything you do. You know, fractions make sense when you get to cut a board. You know? Or you get to cut a piece of metal. And we approached it that way and the idea that we bring dignity back to technical education. I sit in Topeka, Kansas. And it's a pretty good town and it's rural, Kansas is rural. We made no apologies for who we are in tech Ed and we value our students and we value our high schools and we value our postsecondary students whether it's GED or whether it's, you know, advanced systems technology. Because all of them have got to go to work someday, right?

We created Signing Day, 52 colleges this year signed, over 5000 students. I'm going to tell you something, folks, when a student sits down, they sign that letter and that mother turns around, "I never thought I'd see my son sign anything to go to college". And it's a powerful, powerful statement, so we invite them all, don't we? We invite them all to join us.

EMCEE: Thank you. Chancellor Meyer, UW Stout has a rich history in preparing teachers for CTE fields. How have career pathways enriched teacher preparation programs and advanced curriculum to better meet the needs of students.

ROBERT M: I'm at the University of Wisconsin – Stout but previous to that, I was six years at Wisconsin Indian Head tech colleges as a tech college president. I'd just like to thank Brian for his leadership in the state because he's been very unselfish, very generous with sharing the resources that he's got here in abundance in this part of the state. I always appreciated in the Wisconsin technical college system is the kind of camaraderie that we had and the interplay between

the districts. Certainly ATEA as an organization can bring that to you so that we can work together to strengthen what you have, even if you don't have the resources at hand to do that.

James Huff Stout, founded the institution in 1891. He was part of a lumber baron family. He used his wealth to engage in philanthropy, he founded traveling libraries and art exhibits for the state, and he founded the university. He got to know the state superintendent of schools, Lorenzo Harvey, who said you've got such a great model here, we need to replicate it in the state. That is how the university's function came to be, and since the turn of the century up to now. We have 49 programs at Stout that include science, technology, and engineering, and management, so the array has gotten quite a bit broader but the focus is career technical education. That's helped us in our partnership development. How do we develop those pathways? Students can start locally, then later come to Menomonie and finish off or use distance technology. UW Stout has over 1000 different agreements that we've signed and most of them are with the technical colleges. Technical colleges have great laboratories and great technical capabilities similar to what we offer on Stout's campus. The student can start in Kenosha, Wisconsin, get some great experiences at Gateway Tech College, and transfer those experiences to Stout. We really welcome that. They are able to start at a lower cost. It's a win-win-win situation all the way around. We looked at it as a strategy where students have on ramps and off ramps for their educational opportunities and that's what they're looking for. So it really works for us.

EMCEE: Great, thank you so much. Al, careers are one of the most important outcomes of a student's education. How important is it to include work-based learning experiences when designing career pathways and why?

AL Bunshaft: I've been involved for about five years with a group called the STEM Innovation Task Force and I became the co-chair of that task force a couple of years ago. That's a group of employers, an intentionally diverse set of employers who focused on working together to try and build a model of what we perceived as the gap, the gap that existed between what educators were producing at all levels as entry level employees and what we as employers needed. Employers talked about investing anywhere from six months to as much as five years training young people before they were truly productive in their workplace. That's a cost for us as a business, pure cost. If an employee shows up and is unable to be productive, we're just carrying them basically on the books and we're doing the training, so it's a major issue from an employer perspective. We had companies like mine, Dassault Systemes, we had Deloitte

Consulting, Cisco, PepsiCo Foods, Campbell's Soups, chemical companies like Dow and Monsanto, aerospace like Lockheed Martin, the giant retailer Walmart at the table, so about 40 employers. Intentionally coming from very diverse perspectives, and we work together to build a model of the skills that we saw as light in the gap. We called it, and call it STEM 2.0, it but it basically three categories of skills beyond what we call the hard skills, the discipline-specific skills for a particular industry. Employability skills, which are erroneously called "soft skills" by many people because they're not soft at all, they're in fact, probably the most important skill set that we have and carry through our entire career, digital fluency, everyone will need to be comfortable working with digital tools, and innovation science. I like to say the ability to take the puzzle apart and put it together in a different way to really understand the fundamentals that underpin these technologies so that you can then innovate on top of that.

So we build this model, we worked with educators to test the model. Schools actually piloted some courses, for example, in employability skills which are all about complex problem-solving, communication, teamwork, etc. By 2014 we had the framework of this model, and then we started to do independent research into each of these skill categories: Digital fluency, innovation science, employability skills. We had separate teams, I led the employability skills, one of my colleagues led another group, and we had round tables of experts, then we would write a white paper after the round table concluded trying to synthesize the key thoughts that came out of it, and an amazing thing happened. We came back to the committee and over a two-year period as each of these groups reported out, we realized that there was a common underpinning that we were all pointing to about the most effective way to learn these skills, and it's through experiential learning. It's through team-based problem-solving, real world problems, right? So I often say the two nuggets that came out that experiential learning is the key to imparting these skills in a way that students can then take them in the workplace. Nugget #1, and #2 is that the most effective experiential learning comes through employer/educator partnerships and I think Brian, you and your team have done an incredible job



Stacie Riley, Vice President of Student Services and Enrollment Management, Gateway Technical College

of demonstrating that to us here yesterday, I think we're going to see more of it today. I lead our academic strategy here in the Americas and we've taken since about 18 months ago that approach in our company and our whole strategy is not just about placing software in schools, of course we want you all to use all of our products, but it's about taking our clients in each region of the country and getting them involved with the schools and there's a long, long way to go in that regard. You are driving leading edge programs. Clearly what we're seeing at Gateway is really the cutting edge of what I think the best schools are doing, but not nearly enough of industry and companies are working with the schools in their community but plenty of them are complaining about the lack of talented people to hire into the jobs they have. So I think this experiential learning is essential for employers, for educators, and most importantly for the students.

EMCEE: Okay, thank you. Clark, what do you tell students about their future to help them see the entire pathway journey, and why are new methods of career guidance importance?

CLARK C: We established the fact that we validate them for being who they are and what they're doing and we expose them to the opportunities, the career opportunities. Those chambers of commerce, those organizations within those small communities, are part of what we do, and we do tours, we invite them to our campus, we go see their community, we meet people where they are, and express the concept, if you want another generation of whatever mascot your school is, if you want another generation of students coming out of your high school if you send them to our universities in Kansas, we export more graduates out of Kansas, out of

our university system than we bring in, and so in some ways, our small communities are promoting our students to leave the state of Kansas, unless they go to a technical institution. We visit with our communities within a 75 mile radius, the value of what it is for tech ed, and again, we bring in the chamber of commerce, we bring in the school boards, we meet their school boards where they are, and we talk about the values of technical education and then return on investment.

EMCEE: Great, thank you. Beth, as a high school administrator, what do you tell parents about Pathways

and how can they be used to support all postsecondary choices?

BETH O: The dollar amount that usually is much more impactful for parents than students when you're able to quote how much money the parents will be saving. We are a high school during the day, and at night it turns into a Gateway campus where they hold classes in our labs, and this strong partnership has allowed us to become much more versed. So our connection to Gateway allows us to be much more versed in talking to families about this job, this certification, this pathway will garner a job with this kind of salary, and I think parents are taken aback initially at what...what that can open up for their child, because in their head, they want them to go to MSOE, a four year, be an engineer. We talk about our pathways, our engineering pathway has a capstone course in which the students are in teams, they partner with businesses in our area, we're just about two miles from here, so we're in an industrial park, they contact a business and say what problem do you have for our kids to solve, so the kids have been in my office, on a speakerphone with an engineer from a plant, hearing their problem of what they need for an adapter to be fixed, and then those kids are designing the adapter, they're milling it, they're understanding, they're creating it, they're taking it to the factory, and I mean, that's experience that kids usually don't get in high school, but yet that's exactly the type of experience and skills that you heard everyone talk about here that kids need to have in today's world, so I think that kind of experience, I tell parents, okay, you're child's going to be an engineer, that's fine, but they'll be a better engineer having known how to work the equipment. They'll be a better engineer having known how to work together as a team, so you know, and it's that initial kind of working, you know, understanding what the parents' mindset is and what ultimately the goal is for their child.

EMCEE: Great, thank you. Al, how can business and industry partners support their schools to bring the experience of learning to life in the classroom?

AL B: I'm thrilled to hear about a high school capstone program that's doing the same thing, I mean, the most effective learning opportunities are ones where industry is engaging with the schools in their communities, a lot comes out of that, more than just the problem at hand that's being solved, and I think that's what sometimes we also don't recognize. It gives the opportunity for business to get visibility into the pool of students that are there, it gives students the opportunity to understand the real world of work and the type of problems that industry is working on and challenged with. It helps them understand the type of tasks that exist within a company where in education, often

the skills we learn and the techniques we learn are abstract, so by far, the most effective learning experiences come through these kinds of partnerships. Businesses sometimes don't realize that it's not as heavy a lift, maybe, as they think, and I think the second thing that businesses don't realize is you can get real work out of these students. I've worked closely, for example, with Wichita State University, a very innovative program there, they're transforming their



Mr. Al Burnshaft, SVP Dassault Systems, Dr. Robert Meyers, Chancellor UW-Stout, and Clark Coco, Dean, Washburn Tech

campus into what they call an innovation campus. One of their VPs, John Tomlin who runs the National Institute for Aviation Research as well, has literally benchmarked student teams versus offshoring work. In Wichita, there's a massive aviation presence, companies like Spirit Aerospace, Boeing, Textron Aviation, etc. and John tells this story best, but one of those companies came to him with a project that they were explaining that they were sending off to a foreign country to have a lower cost engineering team work on. It wasn't a mainstream critical product, and John said to them, 'I challenge you to let my students do that work and give you that design, and I bet we can do it faster and at a lower cost.' He has proven that to them how effective these young people can be. I was in Greenville, South Carolina, at a GE facility were telling us the story of how these young people come in, whether its Clemson University or South Carolina or the community colleges in the area, and they blow them away with the way they think about problems and the way they approach problems, so there's a lot of enlightenment still to happen in the business community in terms of the full spectrum of the benefits. We fund, in our region where our R&D labs are, senior capstone projects at a couple of universities, real work happens between our R&D teams and those teams in the school. So I think that's the challenge we need to ask ourselves and make sure that these partnerships are living up to that, that we're not playing when we work together, that we're doing real work, and I think that provides incredible value for everyone involved in

that ecosystem between employer/educator/student.

EMCEE: Thank you so much. Chancellor Meyer, our profession often describes the pathway as a 2+2 articulation between a technical or a community college and a four-year institution. UW Stout has many 2+2 programs. Why are these agreements important and how will UW Stout's new center help to increase pathways for educational systems?

ROBERT Meyer: We do have a number of 2+2 programs at UW Stout. One happens to be in management where we take a full Associate Degree, 60 credits in, it's a true 2+2 arrangement, but I try not to focus on that because I think our focus should be on the student and what's best for the student and if the content is equivalent, we should make the transfer and that's where I think you have a win-win situation. The technical college system in Wisconsin as well as the University of Wisconsin - Stout, are both very career-oriented institutions and the "stick rate" that we have is almost 80% or better of the students that get their education within a district stay in the district. Those statistics hold for UW Stout because the whole notion of this public/private partnership and engaging together is really the key to it all. The technical colleges in Wisconsin and UW Stout, every one of our programs has an advisory committee composed of employers and past graduates to make sure that the program is responsive to the needs of employers. Once you have that in place, you start understanding the competencies that you need and it makes the discussion about what should transfer very easy because you know what they're getting at each level, you know where the on ramps are and the off ramps are, so you're creating opportunities around that.

One of the things that we're doing, having a tradition of developing career and technical education is develop students that understand models of career and technical education through an annual summit, inviting the K-12 educators, people from our department of public construction that do the licensing, personnel from the technical colleges. Wisconsin recently we passed Bill 581, which changed the licensing approach to a scorecard now. You can get licensed if you have a very strong technical background or you have a baccalaureate degree, not necessarily one in education. So the scorecard doesn't necessarily ensure that you've got someone going in that can really teach, and that's, that's where the gap is or the problem is. We're partnering with the K-12 districts and the technical colleges to provide opportunities for students to fill in the gaps that they have. For example, someone that has a very strong technical background maybe hasn't even gone to a technical college to get it, but just has that

life experience, may not be a good teacher, they may not know anything about curriculum development, they may not know anything about classroom management, so what we're doing through the center is identifying what the gaps are and providing workshops for them so that they can gain their experiences to be a better teacher. That's the whole idea behind it and it's really a true partnership to make that work for...for people in Wisconsin.

We're also offering retreats related to the topics that teachers might want to know about Project Lead the Way and "Fab Labs." We work with the Wisconsin Economic Development Corporation to deploy that model across the state.

CLARK C: The point simply is this, they need people. Leverage that. Ask. Trane has never turned us down. Snap-On has never turned us down. Because we asked. Someone just has to have the courage to get up from the chair and go across to that chair and ask will you dance with me. And that's an attitude thing, folks. We take no second seats in technical education, I said that earlier. And so think about that and go ask these companies, we have several of these companies on our campus in the last six years. If they tell you no, guess what, we're going to somebody else, right? So I just, you know, I ask you to think about that a little bit.

AL B: Can I try and build on that a little bit? I think not enough schools are proactive, but I also think that employers, especially large corporations, are waking up to the incredible important role that you as community college leaders play. I'm on the Mass. High Tech Council Board, a collection of high tech companies in the New England region. We literally had a discussion at the board table about two years ago where the biotechs were saying that they're waking up to the fact that we're talking about the talent cap, we're talking about the fact that we can't find the right skills they can in their industry. And they said that they realized, and they do realize, that they were over specifying jobs that because they all had a Master of Science or a Ph.D. in biotechnology they think everyone that works there should, but they realize that the large majority of employees, especially in the manufacturing environment, don't need that and yet they still had bachelor's degree requirements on their job specifications because they're flexing their muscles, literally, their intellectual muscles, and it just wasn't needed. So they've taken a more proactive approach working with the community colleges. And the other small data point that comes to mind is we're working with a giant client of ours from the northwest region whose expanding operations in the southeast region. They brought together and we're

working to bring together what they called an education summit with us and some of the schools that they felt they needed to be partnering with to fulfill their needs for talent over the coming years. And just as an anecdote, 11 schools were invited to this meeting. Two were universities. The other nine were schools like yours, and I think that's the right balance, frankly, that these large, innovative manufacturing-oriented employers need. So I support your comment. We need to make it happen as a community, right? The ultimate beneficiary is our community and our students and our families and our society and our business helps fuel all that.

EMCEE: Thank you all very much. In closing today, I'd like to ask each of you to offer the attendees your best piece of advice when working on Pathway initiatives. Beth, we'll start with you.

BETH O: My best piece of advice is understand that K-12 training and preparation doesn't align with your knowledge set and with your expertise we don't necessarily know what you need, so be patient with us in terms of helping us understand what you need and also understand that we can't move as quick as you can, so help us move as quick as we can for that, and understand that we have a lot of people coming at the K-12s wanting this and this and we've got to be able to do it strategically and thoughtfully and that's why a lot of times the best path for us is to connect with the conduit to you through the technical college.

EMCEE: Clark?

CLARK C: We're either going to help you out or we're going to help you out. And so one of the challenges we're putting on the table now is to our instructors, do you know every program of study related to your program of study within 75 miles of Topeka, Kansas? In other words, do you know where all the auto programs are, Abilene High School, Topeka West, wherever they might be?

Do you know who the instructors are? Do you know anything about them? And simply asked, do you know anything about their families, because I learned a long time ago, if you want to recruit point guards, no offense to high school counselors, they don't know what a point guard is, all right? The basketball coach knows who it is. So we have branched out and changed the whole way in which we recruit. You know, we talk about Signing Day, right? We're going to their school signing them one by one just like they are an athlete and their parents are sitting there with us. And we're talking about the career opportunity, let me share what's going to happen in 12 months' time. Your son or daughter goes to class, they're drug-free, they can do their cellphone appropriately, and I will have your son employed

by 5:00 of the day they graduate. We can do that. So we have reached back out to our school systems and that's the message we sent. You come in my office at 9:00, you've done those things, and I can have you a job at 5:00. And we can do that. We have enough industry partners that want that. So we've approached it that way.

EMCEE: Thank you so much. Chancellor Meyer?

ROBERT M: Every one of our programs has a person who is focused specifically on that program and trying to make these partnerships work. But it does take energy and it does take a commitment. If you're expecting a lot, you better expect a lot from yourself and invest a lot into these partnerships because they do take effort, they do take time, but we're committed to it and the other thing I would say is with all that we've heard about the talent gap and the skills gap, employers are ready to come to the table, they're ready to work with us, too. There's a new attitude all the way around. Let's make that work for us together in these partnerships.

AL B: I want to talk about two topics maybe we haven't talked about a lot, inspiration and awareness. And I think both are lacking. It's on all of us to expose more young people to the incredibly exciting opportunities that these changes in our world are presenting to them. A five minute video about our living heart program makes people say wow, I never realized how integral these digital tools are going to be to the future of healthcare, and for example, maybe I need to learn something about computer science even though I'm interested in going into medicine. So inspiring the next generation in whatever field it is, is so essential to getting a more robust pipeline of diverse candidates into all of these fields, so that's #1, and #2 I want to mention is awareness. Parents and counselors, don't at all understand the world of work today and where it's going and how fast it's changing. If people realized as they're going through elementary and high school what the world of work looks like and the kind of skills you need to work in that place.

ROBERT M: Reach across to the aisle and ask them to be part of the date idea and what Al's saying reaching out and having someone from industry or an employer come into your space.

EMCEE: Great, well thank you all so much for sharing your vision, expertise, and best practices related to Pathways.



American Technical Education Association Region 1 Conference

November 7 - 9, 2018
“End to End Digitalization”



Dassault Systemes Executive Briefing Center and Demonstration Center
175 Wyman Street,
Waltham, MA 02451



Olin College of Engineering
Olin Way
Needham, MA 02492



WEDNESDAY NOVEMBER 7

ATEA member reception Dassault Systemes Executive Briefing Center

4:30-6:30 Evening reception—Executive Briefing Center conference participants, panelist and other business and education leaders.

5:00 Brief Overview of the conference and ATEA.

Shuttle buses from Hyatt leaving at 4:30—returning from Dassault to the Hyatt 6:00 and 6:30

THURSDAY, NOVEMBER 8



Al Bunshaft

9:00 am - Welcome and Mission, History and Overview of ATEA and goal of growing in Region 1

- Al Bunshaft Senior Vice President Global Affairs Dassault Systemes

- Bryan Albrecht, President of the ATEA Board of Trustees and President of Gateway Technical College

9:30 -10:00 - Keynote: Secretary Jim Peyser, Massachusetts Secretary of Education

10:10-12:00 - Tours of Dassault Systemes: Virtual Reality Center, Solution demonstrations, Fab Lab

12:00 - 2:00 - Lunch and ATEA Region 1 Panel “Digitization: the new common fabric of work and education”

Healthcare - “Training and education digitization contribution to pathways” Alex Clifford, VP Maine College of Health Professions

Manufacturing - “Advanced manufacturing of biomedical devices and digitization” Dassault Systemes or college representative

Cybersecurity - “Across sectors but all one grid” Representative from National Cybersecurity Center
Workforce - “Region 1 work-study, internships and apprenticeships” Dr. James Sherrard, Chair Nuclear Programs, Three Rivers Community College, Norwich CT

2:15-4:15 - Tours of Executive Briefing Center Solid Works Education Team—how Dassault Systemes helps technical colleges migrate to a digitized world—panel and them move to tours.

SWAFK, AerosPACE

4:15-5:00 End-to-End Digitalization examples

City, Living Heart, Additive Manufacturing

Open evening:

For dining as a group close to the Hyatt and Dassault: Cooper House Pub, reception area near bar and table seating for dinner, limit 20 self-reservation. Naked Fish, restaurant dining self-reservation, link and/ phone number

FRIDAY NOVEMBER 9

**Olin College of Engineering,
Olin Way, Needham, MA 02492**



8:00 - Board Buses from Hyatt to Olin College in Needham. Those leaving for the airport from Olin College should bring luggage and plan for transportation to the airport.

9:00-11:00 Olin College of Engineering -

“Outstanding new design for collaborative engineering education.”

Welcome and Introduction to Olin College of Engineering: Dr. Richard Miller, President

Meeting and tours: Michelle Davis, Chief Marketing Officer

11:00-12:00 Transportation back to Hyatt hotel

Individual going on to Logan Airport from Olin School of Engineering should arrange transportation.



AMERICAN TECHNICAL
EDUCATION ASSOCIATION

Region 5



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OCTOBER 4th & 5th, 2018

**RACING TO
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Dr. Thomas R. Burke

Technical Education Center

6565 State Ave. Kansas City, KS 66102





American Technical Education Association Region 5 Conference

October 3 - 5, 2018

Hosted by: KCKCC-Technical Education Center

Hotel Country Inn Suites by Radisson, Kansas City at the Village West, Kansas
link to hotel on the website registration page ateaonline.org



Schedule At-A-Glance

Wednesday, October 3, 2018:

3:00 – President’s Roundtable and/or Panel Discussion

5:30-8:00 – Networking Social/Early Registration – Vendor Showcase and refreshments by Culinary Arts – busses will be available to pick up from hotels; casual dress

Thursday, October 4, 2018:

8:00-9:00 – Registration and Breakfast

8:00-12:00 – Board of Trustees Meeting

8:00-1:00 – Vendor Showcase

8:45-9:00 – Welcome

9:00-9:50 – Breakout I – Tours of TEC/Programs

9:50-10:00 – Break

10:00-10:50 – Breakout II

10:50-11:00 – Break

11:00-11:50 – Breakout III

11:50-1:00 – Lunch

1:00-4:30 – Tours

6:30 – Dinner (TBD)

Friday, October 5, 2018

8:30-9:00 – Continental Breakfast

9:00-9:50 – Panel Discussion – Kansas Board of Regents/Technical Education Authority (Blake Flanders)

9:50-10:00 – Break

10:00-11:00 – Keynote Speaker: Wes Stith, Purchasing Manager, SBLO

11:00-11:15 - Raffle

11:15-11:30 – Next year’s host: Dunwoody College of Technology, Minneapolis MN

11:30 – End of Conference



Standing: L-R– Alicia Hooks, Cliff Smith-Chairperson, Kristin Povilonis, Lori Chaffin, Charles Knapp, Carly Eastling, Sheridan Smith
Front: L-R– Paul Hancock and Rich Piper

WESLEY STITH | Vice President Purchasing Manager and SBLO



Wes joined Clark Construction Group, LLC in 1996 as a Project Engineer with the Company’s Purchasing Department. In 2002, he was promoted to Senior Purchasing Agent where he continued to strengthen the Company’s relationships with its subcontractors. In the years since, he has been responsible for purchasing an abundance of projects throughout the country, including the \$300 million dollar National Museum of African American History and Culture, Washington, DC (currently), the \$400 million dollar Camp Pendleton Hospital-JV, Oceanside, CA, the \$700 million dollar Washington Headquarters Service Office Building, Alexandria, VA, the \$1.4 billion dollar New Campus East, Fort Belvoir Virginia Project, the \$600 million dollar John Hopkins New Clinical Building, and the \$408 million dollar, one-million-square-foot, Design/Build DC Major League National’s Ballpark, Washington, DC.

In 2005, Wes took on the role as Vice President and Purchasing Manager. Wes also commonly serves as the SBLO (Small Business Liason Officer) his role is to ensure that the goals of each project’s small business subcontracting plans are achieved. Wes develops bid packages specific for small businesses, coordinates opportunity fairs, small business workshops and seminars. Wes in conjunction with Clark Construction is committed to working cooperatively with small businesses to assist in increasing the size, scope and scale of their operations.

Wes holds degrees from Norfolk State University and Widener University. He is an active leader in a number of company initiatives, including Clark Corporate University, Strategic Partnership Training Program, Subcontracting Development Group, and Mentor/ Protégé Program.



Chair: Cliff Smith,
Dean of the Technology Center

Writing to Enhance Learning at Two Year Colleges

Nasser A. Razek, *The University of Akron*

In the course of a casual conversation with a colleague, I mentioned writing for publication in *The Journal*. We were presenting at a regional conference in Ohio where he had submitted a wonderful proposal to speak about hands on learning as part and parcel of a two year college education. "At two year colleges, you do not find good writers", he replied as if this was a proven fact. Astonished by such a sad stereotype, I tried to argue with him using the argument that his own proposal negates this assumption. However, he insistently stated that students at two year colleges are not trained to write and consequently, faculty become less and less adamant about writing. I returned to my hotel room that night determined to address the issue. I could not think of a better venue than *The Journal* to share my opinion.

Writing to Enhance Learning at Two Year Colleges

Writing as a component in the two year postsecondary institution seems as a demanding academic endeavor both from the student perspective and as a perception of the instructors as well. Therefore, this note addresses some common myths about writing and the two year college students. After that, it taps on the role of writing in enhancing student learning. Finally, some useful tips are offered for the technical education instructor to make sure these valuable writing tasks are purposeful, motivating, and maximizing instructional time.

Common Myths about Writing

Several myths surround writing as a task for developmental students. These may include: postsecondary students are not good writers; writing is not among the outcomes of two year education, so don't focus on it; all writing assignments have to be graded; students will feel overwhelmed if you ask them to write frequently; if the instructor does not grade the writing assignment, students will not do it anymore; and more writing tasks will overload the instructors work schedule with no use.

Technical education students do not need very sophisticated skills to accomplish writing tasks as long as the writing tasks had clear instructions, introduced by a list of expectations, and modeled with a quality sample (Elbow & Sorcinelli, 2014). Graduates of technical and community college education will definitely encounter several writing tasks in the professional careers that may include: report writing, drafting instructions for operations, reporting malfunctions, putting down a petition, or even a request for a new piece of equipment.

Instructors in a college course are not required to give a grade to all writing assignments as long as they explain this beforehand to students. Assignment rewarding may count towards participation points or attendance check. Although frequent writing tasks may seem overwhelming at first sight, students will develop adaptive skills down the road that will help them improve their writing and benefit from the writing tasks. Students learn quickly what is practically important and what is not. This may jeopardize their participation in the ungraded writing assignments. However, if the instructors define the rules and the value of the writing task, show the students the worth of these tasks in points, and prove to the students that they are reading these assignments, students will definitely take these tasks seriously. Frequent writing tasks can help instructors focus on what is really needed as part of the classroom instruction and what students already know. They do not need to be extra long tasks. They may be a response to a simple question or even a half page reflection on what was learned during the class session. These will provide a consolidated learning experience for the students, help them voice what they have learned, and give prompt feedback to the instructors about their student needs and learning progress. In the meantime, they will not tax the instructors' time as they are short and easily reviewed. Moreover, Students' reflective writing is not usually marked for content but rather for completion (Xiang Huang & Kalman, 2012).

Improving Student Learning

Then, the question poses itself; how can writing improve student learning in any classroom? Writing is an active and highly flexible exercise where the instructors may vary the task and make sure it is highly connected to class material. So, instead of using it as an assessment task it can link knowledge learned before to what is on the agenda for the current session. Writing gives a materialized form to thought in a way that helps students review and organize their thoughts. Moreover, engaging in a writing activity helps students generate more ideas relevant to the topic at hand. It helps them predict what they might need to know to accomplish a certain task while providing opportunities for self-critique. It enables students to criticize and reflect on their articulation of a concept or a process they feel they have fully acquired. Writing may increase students' knowledge of how they learn while enabling students to enhance their knowledge acquisition and optimize their learning as they become more intentional about their learning. Writing also helps students raise the level of their language use. Students are

also more conscious about their product when they write than when they speak even when the writing task is not going to be graded. Another addition to the many privileges of writing is that it encourages student creativity through providing the quite personal mental space students assume while responding to the prompts. Writing provides a wonderful opportunity for students to be analytical both of their own writing and the writing of others.

Final Thoughts

Given the established value of writing, it is essential for technical education instructors to utilize it for the benefit of their learners (Fry & Villagomez, 2012). However, providing quality instruction always comes with a little price on the part of the instructor. This price, in this case, includes a little more planning for individual sessions, a little more reading, and flexibility to modify and differentiate instructions according to student learning indicators collected from the shorter writing

tasks. This price will not go unrewarded though. Instructors who follow these best practices techniques encounter better quality assignment as student seamlessly develop higher writing skills throughout the course, become more qualified for higher level courses, enjoy a satisfactory sense of self-accomplishment, see tangible results in their students' learning outcomes, and feel more comfortable using these techniques in subsequent courses as they become accustomed to the process.

References

- Elbow, P. & Sorcinelli, M. D. (2014) How to Enhance Learning by Using High-Stakes and Low-Stakes Writing. In M. Svinicki & W. J. McKeachie (Eds.), *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (14th ed.) (213-231). Belmont, CA: Cengage.
- Fry, S. W., & Villagomez, A. (2012). Writing to Learn: Benefits and Limitations. *College Teaching*, 60(4), 170-175.
- Xiang Huang, x., & Kalman, C. S. (2012). A Case Study on Reflective Writing. *Journal Of College Science Teaching*, 42(1), 92-99.

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Fall regional conferences keynote, breakouts, industry tours and trade show, "out-of-town" welcoming reception and Thursday evening social part of registration price.

Fall members conference on focused topic or trend in technology or delivery of technical education in locations of interest to member institutions. Limited to 50 participants.

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Email updates on members and activities

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The Benefits of Using Collaborative Learning in Post-Secondary Technical Education

By Teresa Milligan, MLE, Dunwoody College of Technology

The Need for Collaborative Learning in the Technical Education Classroom

The call to adapt the research-backed practices that produce learning is not new. A unique set of circumstances, however, prompts higher education, especially post-secondary CTE, to reexamine the calls of the likes of Chickering and Gamson (1987), Barr and Tagg (1995), and Tinto (2012; 1997; 2007). A 2014 survey of U.S. senior executives confirms the widely-accepted premise that a skills gap exists, and that the deficiency is found in skills like critical thinking and collaboration (Adecco Staffing U.S., 2014). More relevant to this article, the survey also notes that the industries most affected by this gap are manufacturing, technology, and professional and business services (Adecco Staffing U.S., 2014)—all fields that hire graduates of post-secondary CTE programs. What's more, Georgetown University Center on Education and the Workforce contrasts two contrasting descriptors of Millennials: a high unemployment rate, and the most educated generation in American history. This implies that a college degree has not been enough to surmount two recessions (Hanson & Gulish, 2016). It appears that the issue is not necessarily a lack of education. Instead, the lack is within the educational process itself.

Collaborative Learning & Technical Education

Collaborative learning offers a number of opportunities to address characteristics of technical programs in a way that promotes what the student must learn and must do to learn. Figure 1 presents a summary of this:

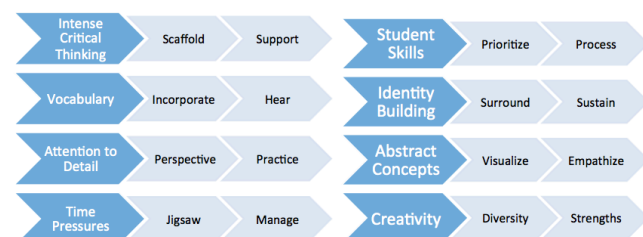


Figure 1: Technical Education Components

Intense Critical Thinking

Like academic areas, technical programs require students to consider concepts at a sophisticated level. Students in post-secondary CTE programs often need to perform at high levels in two or more domains of learning (i.e., cognitive and

psychomotor) simultaneously, or to practice mature, expert-level thought processes (i.e., metacognition or visualization). Collaborative learning, then, fosters and encourages this critical thinking in that the collaborative group acts as a kind of scaffold. A scaffold, first defined by Wood, Bruner, and Ross (1974) is a technique that allows the instructor to tailor the level of difficulty and gradually decrease the amount of support provided to a student, with full independence as the end goal (Holton & Clarke, 2006).

Considering what the research has found about the typical characteristics of students in technical programs (Bailey, et al., 2003; Hirschy, Bremer, & Castellano, 2011), it might appear that this level of critical thought is outside the student's zone of proximal development (Vygotsky, 1978). However, Fernandez, et al, found that students could expand their ZPD working as a collaborative group because the group provided a way of scaffolding by way of the language used (Fernandez, Wegerif, Mercer, & Rojas-Drummond, 2015). In effect, language can act as a scaffolding tool as a way of making the thought process of a more-able student available to another who may be less so. As Barkley (2014) notes: "Well-designed collaborative learning activities expose students to concepts and understandings that are within their ability to grasp but are not yet part of their personal understanding" (p. 16).

Further, collaborative learning fosters this level of critical thought with built-in social support systems. Two defining features of collaborative learning that exemplify this are intentional design, meaning instructors deliberately create learning activities, and co-laboring (Barkley, Howell Major, & Cross, 2014), also known as positive interdependence (Johnson, Johnson, & Smith, 2007). Since instructors can make measured decisions about the learning task through intentional design, they can capitalize on student strengths and control for any challenges to maximize the learning with purposeful group membership. These two features create a system in which students who may not have been able to reach higher orders of thought independently are able to as part of a collaborative group.

Vocabulary

Like any new area of study, students in technical programs are required to become fluent in the language of their industry to be successful. Shanahan and Shanahan (2008) describe a literacy continuum on which specialized literacy skills

associated with a specific subject, including vocabulary use, characterize the most sophisticated level. Moreover, students learn this nomenclature as part of the prose of the industry.

Collaborative learning affords students opportunities to incorporate the vocabulary to articulate their thoughts. As Barkley (2014) discusses, social constructivists hold that students learn through interacting with others, and that students learn at a deeper level when they create something for the purpose of sharing it with others. The use of the learned vocabulary to create a thought for the purpose of sharing with others, then, becomes a way students deepen their understanding of the concept and begin to own the vocabulary as part of their professional identities. More specifically, collaborative learning groups would provide a natural practice to answer the suggestion made by Shanahan and Shanahan (2008) to make specialized disciplinary literacy skills directly and explicitly taught. Students are able to both speak and hear the vocabulary they need to master to become a professional.

Attention to Detail

Although many academic areas require specific attention to detail, technical programs do so to an extent that might be expected to follow an extensive familiarity and experience with the idea. Specifically, students in post-secondary CTE need to practice manufacturing, repairing, or troubleshooting a physical object or a theoretical situation from a variety of dimensions. Collaborative work is often all but necessary to figure in all perspectives involved in this level of detailed analysis.

Further, collaborative learning can help sustain and even deepen this level of attention needed since students can more easily concentrate their practice on a narrowly-defined task. Because an effective collaborative group designates each member a role and is heterogeneous in membership, members can both dedicate more attention to their specific responsibility and practice other related tasks in subsequent projects.

Time Pressures

Most technical programs keep a rigid, intense pace with little flexibility to find support or attend to priorities outside of classes. Students often must learn the concept at the time it is introduced and within the time given in order to keep the pace needed. In addition, a project-based curriculum means that students must practice careful time management both inside and outside a class session.

Collaborative learning answers these time pressures in a number of ways. As groups delegate tasks, students become experts of a sort in their charge. This “jigsaw” (Johnson,

Johnson, & Johnson Holubec, 2013) of tasks furthers the positive interdependence in the group, and keeps the cognitive load manageable for students to learn new concepts or procedures. This is important for students who need to know where to spend their limited time and energy outside of class, and fits well with the research on goal setting. Brophy, a well-respected scholar on motivation in the classroom, argues for using collaborative learning to promote an environment that is conducive to learning and to focus attention on learning goals instead of performance goals (Brophy, 2005; Brophy, 2004). With a firm focus on what the objective of the learning is, students in post-secondary CTE can use their time most wisely under these time pressures.

Further, students are better able to manage their projects structurally in a collaborative work environment. Barkley and colleagues’ synthesis notes the strong evidence that collaborative learning benefits a wide range of students, specifically for students with characteristics commonly found in post-secondary CTE classrooms: nontraditional students, women, students from underrepresented racial and ethnic groups, adult and reentry students, commuters, and international students (Barkley, Howell Major, & Cross, 2014). These groups likely benefit from collaborative learning because students in collaborative groups are given the agency to flex the structure and nature of their projects in order to manage a work-school-home life balance.

Student Skills

Because of the nature of a lab course structure and the expectations of students at the post-secondary level, it is critical for technical students to be fully engaged and psychologically ready to learn. The results of several studies suggest that collaborative learning positively correlates with the development of these student skills. For example, Johnson, Johnson, & Smith (2014) found a number of factors that occur as a result of cooperative learning—a specific version of collaborative learning—that contribute to improvement in a range of outcomes, including critical student skills such as self-efficacy, self-concept, the ability to manage difficulties, and a positive attitude toward learning. Collaborative learning, then, can meet these particular needs in post-secondary CTE in two ways: by providing students an impetus to prioritize their classwork, and as a mechanism by which students may refine their process as learners.

First, the positive interdependence that students find in collaborative learning generates a motivation for group members to prioritize the project or task. As Astin (1993) notes, the interaction found in collaborative learning “motivates students to become more active and more involved participants in the learning process” (p. 427). In a post-

secondary CTE classroom, positive interdependence (as defined by Johnson, Johnson, & Johnson Holubec, 2013) often is a natural component of lab assignments, such as in the form of a shared resources, mutual identity, or a hypothetical situation.

Second, collaborative learning exposes students to a number of different processes for operating in a classroom, which can further inform and refine their own process. The way in which a student completes a lab assignment, prepares for a test, takes notes during lecture, or generally engages with the material is very personal, and is often assumed to be established by the time a student enrolls in college. Collaborative learning provides the chance to see how other students take on and proceed with course tasks, even to combine processes for a stronger single group process.

Identity Building

Students need to develop a sense of self—an identity—that defines who they are as professionals in the field as a first step toward fully mastering the knowledge and practices of an expert. Andragogical research suggests that the relationship between identity and learning echoes a familiar expression: “we are what we learn” (Nicolaescu, 2017, p. 107). The process of building a professional identity requires a certain amount of time and opportunity, but is vital for students to fully embrace the skills required by a particular profession. Collaborative learning builds identity by surrounding and engaging students in authentic tasks that provide a platform on which to simulate variations of an identity and refine their identity through practice. The ability to define how one operates in a collaborative setting is critical toward gaining a fully understanding of who one is professionally. Collaborative learning also provides students with an opportunity to engage with burgeoning experts in their fields: their classmates. Such an environment creates a forum to sustain the process of identity building long enough for a student’s identity to be fully realized.

Abstract Concepts

Concepts in technical programs are often abstract since many programs pull from areas like physics, calculus, and algebra. Programs also require abstract thinking in that students often need to understand how concepts are categorized, as well as how things interrelate and how a concept transfers from one industry to another or from theory to application.

Many of these abstract concepts can be presented more concretely in post-secondary CTE as a lab component or an applied project. Post-secondary CTE is an opportune classroom to couple an abstract concept, like geometry, to

a concrete one, like a blueprint, which, in turn, provides relevance and develops the ability to understand more complex abstraction. Collaborative learning aids in this process by often utilizing management tools that need to transform these concepts into visual representations, or requiring members to describe concepts in detail to other members. Structures that require groups to complete a graphic organizer or that prompt discussion to analyze or reflect can provide depth and relevancy to these abstract concepts.

In doing so, collaborative learning also provides an opportunity for students to build empathy, especially for customers who would be considered non-experts or for colleagues who may not be able to follow a message. The interaction required for collaborative learning has the potential for members to gain the perspective of one another, and an amount of understanding for future audiences. In an interdisciplinary collaboration, students can be exposed to the perspectives of those in neighboring programs (Miles & Rainbird, 2015), such as between electrical construction and architecture. The ability to understand how a message may be misinterpreted, to gauge the level of background that might be required, or even just to gain an appreciation for what an expert may take for granted as common knowledge, are important skills in customer relationships, and not easily taught in a standalone assignment.

Creativity

Increasingly, the technical programs emphasize the value of creative thought, not just in ideation or design, but in areas like troubleshooting and customer relations as well. Collaborative learning, in its fundamental tenets, is well-suited to cultivate these creative processes by providing students with a pool of diverse viewpoints and by providing a structure in which groups can capitalize on each other’s strengths.

Collaborative learning allows students to practice these creative processes in a way that takes advantage of the diverse perspectives and experiences members of the collaborative group bring to the project. Among the large body of research on creativity and effective groups, a survey of experts in the design field by Turnbull, Littlejohn, and Allan (2010) confirms that knowledge sharing and social contact are central to creativity, and that creativity is enhanced in collaborative environments. This is also true of interdisciplinary collaborations (Miles & Rainbird, 2015), which are very often used in post-secondary CTE. To complement the large body of research on the benefits of diversity to an effective group, an extensive review of the literature by Hämäläinen and Vähäsantanen (2010) adds a discussion of the overlaps—and differences—specifically between collaborative learning and the creative process as those related to knowledge

construction. Students in technical programs come with a variety of background knowledge and prior experience, and a collaborative group presents students with a chance to capitalize on these diverse perspectives and build the knowledge needed to generate the collective creativity needed to find the best solutions.

Not only are students given exposure to a number of diverse perspectives, but they are also offered an opportunity to play up their particular strengths for a collaborative purpose. Scholars have found that collaborative learning allows students to become more confident and willing to communicate with others (Danielewicz-Betz & Kawaguchi, 2015). In a collaborative group, the fortes of each member can combine to produce a momentous creative force, the likes of which is urgently needed to face the most complex, enigmatic problems in the technical fields.

Conclusion

A symbiotic relationship exists between collaborative learning and post-secondary career and technical education (CTE). The structures used in collaborative learning can answer the specific needs of post-secondary CTE programs and students. Specifically, the unique elements found in post-secondary CTE allow for full use of the known benefits of collaborative learning. The post-secondary technical classrooms observed for the explicit purpose of investigating this relationship have demonstrated the skills and components of learning which have a particular significance to post-secondary CTE:

- **Intense Critical Thinking:** Collaborative groups foster this level of critical thinking in that they act as a scaffold and built-in social support systems.
- **Vocabulary:** Collaborative learning affords students opportunities to incorporate and hear the vocabulary they need to master to become a professional.
- **Attention to Detail:** Collaborative learning allows students to figure in all necessary perspectives and to concentrate their practice for a more sustain and deeper level of attention.
- **Time Pressures:** Collaborative learning jigsaws tasks and allows for better project management to address inherent issues stemming from a rigid, intense pace.
- **Student Skills:** Collaborative learning provides students with an impetus to prioritize their classwork and a mechanism to refine their personal learning process.

- **Identity Building:** Collaborative learning allows students to surround themselves with a task and team to define themselves as professionals, as well as a sustainable environment to fully realize that identity.
- **Abstract Concepts:** Collaborative learning uses tools and processes that help students visualize the abstract concepts included in technical programs, which then provides an opportunity for students to build empathy.
- **Creativity:** Collaborative learning is well-suited to cultivate the creative processes by providing students with a pool of diverse viewpoints and a structure in which groups can capitalize on each other's strengths.

Collaborative learning is a pedagogical approach that has the potential to address each of these significant elements. A post-secondary technical classroom environment and the nature of the work involved require and are enhanced by a collaborative learning approach. In the context of the pressing needs of the industry, the accountability and scrutiny placed on higher education institutions, post-secondary CTE must answer the call by Barr & Tagg, among others, to shift the focus of a classroom toward the production of learning (Barr & Tagg, 1995). Using such methods as collaborative learning can provide one part of the solution toward better facilitation of learning in post-secondary CTE and result in higher quality graduates, ready to face the challenges of the workplace.

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What is the American Technical Education Association?

ATEA is an autonomous, non-affiliated international association devoted solely to the purposes of postsecondary technical education. It is an organization dedicated to excellence in the quality of postsecondary technical education with emphasis on professional development. ATEA is a driving force behind workforce development.

ATEA was founded in Delmar, New York in 1928 and incorporated as a non-profit professional education association in 1960. In 1973 the national headquarters moved from New York to Wahpeton, North Dakota to the campus of North Dakota State College of Science. In 2012 the national office moved to Dunwoody College of Technology, a private non-profit technical college founded in 1914 in Minneapolis.

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Technical Education (Postsecondary Vocational Education) System in Finland

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Finland continues to lead the world in the global Program for International Student Assessment (PISA) scores (Finland Ministry of Education and Culture, 2016a.). Much has been written about Finland's common elementary curriculum for all (grades 1-9); however, little has been shared regarding Finland's secondary or postsecondary vocational education programs. Finland has a dual system of secondary education: academic and vocational. In Finland, education is a civic right for all citizens. Finland invest in its citizens from birth and throughout their education with all children receiving hot meals, tuition free preschool/daycare starting at age one and a common comprehensive public-school education starting at age 7 (Sahlberg, 2015). At the age of 16, half of all students select vocational education as their secondary education curriculum. At the postsecondary level, adults attend adult education programs, postsecondary vocational education or traditional university education tuition free. Finland uses the term vocational education to describe workforce education for youth and adults at the secondary and postsecondary level, including workplace education and training.

In this article, we will use the term postsecondary vocational education to mean postsecondary workforce education or postsecondary technical education. In Finland, the University of Applied Science (UAS) offers vocational education via bachelor and master level degrees and coursework. Earlier in the history of these new postsecondary institutions, they were referred to as polytechnics. The name 'polytechnic' - the English translation of UAS - has been a controversial issue in Finland, and in fact 'poly-vocational higher education college (or institute)' would be a more appropriate because these institutions cater to all vocational occupations, not only technical occupations. We will use the term University of Applied Science (UAS) throughout. This article describes the development of the Finnish system of University of Applied Sciences to provide postsecondary vocational education since 1970 as part of the Finland's world recognized education system.

Postsecondary Vocational Education in Finland

In 1950 Finland, some 46% of the labor force earned their

living in agriculture. By 1970, the proportion in agriculture was 20% (Laukia, 2013). In those days, the amount of industry, trade, and public services increased, and urbanization started as people moved from the countryside to the cities. Since the economic crisis of 1990s, local education authorities have increasingly struggled with shrinking budgets, leading to enlarged class sizes, reducing some school-support services, and, in many cases, also merging and closing of schools to gain efficiency (Rinne, Kivirauma & Simola, 2002). In the 1970s, about 30 percent of young people chose vocational education and training post-graduate studies, and by the early 2000s secondary education and vocational training shared equal enrollments (vocational and academic) (Meriläinen, 2008, 2011). Vocational education and training qualification for postgraduate studies increased the popularity of education among young people.

The Finnish education system underwent a series of structural reforms in the 1970s, with the implementation of the comprehensive school causing a significant increase in higher education participation. The reforms responded to the economic structure change, which was aimed at raising the level of education of different population groups. At the same time, schools were moved to a common centralized state management system. The aim was to improve equal opportunities for young people to progress in education in accordance with the expectations of society (Meriläinen, 2008; 2011). By the end of the 1970s, the number of secondary school graduates remained high but the number postsecondary enrollment remained low (Stenström, 1981). In addition, 20% of those who entered universities had gained qualifications from both a general secondary school (including the Matriculation Examination required for university admission) and a secondary vocational school. This multiple education system was one reason for the emergence of the UAS in Finland (Numminen, 2000).

The reform of secondary vocational education between 1982–1988 can be summarized in the following changes (Numminen, 2000). Secondary vocational programs led to blue-collar tasks, while the postsecondary vocational programs were for supervisory roles. The secondary and postsecondary vocational programs started with a shared common academic calendar. The general education component of secondary

vocational education opened routes to further and higher education. The volume of the educational provision in the different study fields was proportioned to the demand for labor and the size of the age group (Stenström & Vitolainen, 2014).

The 1990's brought further major education reforms for vocational education. With the rapid collapse of the banking system and the fall of Soviet trade, the Finnish social and economic situation quickly changed (Heikkinen, 2001). In 1995, Finland joined the European Union (European Higher Education Area, 2016). Before this, the school system had started to experiment with reform for both secondary and higher education. These reforms were carried out by the Ministry of Education and involved the provision of postsecondary vocational education in UAS. At the time of the establishment of the UAS, the objective of the educational policy was that about 65% of each age group would complete a postsecondary degree (Ahola, 1997; Lampinen, 1998). The Finnish UAS were developed from former vocational colleges and postsecondary vocational education institutions.

UAS first acquired legal status in 1996 with total number of UASs originally being 60, but today that network consists of about 24 (Finnish Ministry of Education and Culture, 2016). UASs differ from universities in terms of their administration. They are locally run and financed, have close contact with industry, and do not issue doctoral degrees or undertake basic scientific research.

UAS also differ in terms of their teaching faculty structure with no rankings for instructors. However, these teachers are required to hold a credential in pedagogy of teaching vocational education (Harrebye, Sorsensen, Taalas, Finnbugason, Bjerknæs, & Petersson, 1997). Vocational teaching credentials are offered at the graduate (master's) level at some UASs and admission is very competitive with only 10-20% of applicants being admitted to vocational teacher education (Laukia, 2013a).

Unlike universities, UAS focus on research and development by applying previous knowledge, rather than producing new research. They have a very clearly legislated objective in regional development. In the UAS, there is a mandatory five-month practical training for all students, and UASs serve as a good platform for dispersing applied knowledge throughout higher education. UASs provide professionals for local employment and are governed by the city, although they receive most of the funding from the Finnish government. Students pay no tuition; however, they are responsible for their books and supplies. Reduced cost lunch, transportation and housing are available for students as well.

Until recently, University of Applied Sciences (UAS) was granting only bachelor degrees (3–4 years) that are specialized to particular vocations (e.g. Bachelor of Engineering). These degrees

are different from, but in their level comparable to bachelor's degrees which are awarded by universities. In 2005, "higher UAS" degrees (which are translated into English as master's degrees) have been introduced for holders of an UAS degree or a similar degree, like a bachelor's degree from a university, to continue studies while also working. UASs do not grant the doctoral degree, and a holder of an UAS higher degree is not eligible for doctoral studies in universities without specific studies bridging the gap between the two orientations (academic and vocational). Because degrees from a UAS are more oriented towards practical applications, compared to the degrees offered by Universities in Finland, a holder of an UASs degree, wishing to get a master's degree from a Finnish university, may have to complete 60 European Credit Transfer and Accumulation System (ECTS) worth of theoretical and scientific studies in addition to the normal master's degree requirement (equal to about 1.5 years of full-time study).

The phrase "equal but different" is used in conjunction with the dual model, meaning that Finnish UASs and universities serve different goals in the field of higher education and should not be combined on any level. The ongoing Bologna process, however, has led to some reform, where by complementing UASs studies with some theoretical studies, the route to higher degrees is open (European Higher Education Area, 2016).

There are about 150,000 students in UASs (Kosunen, 2015). The most common field studied is engineering. Engineers graduate after a minimum of four years. Other typical fields of study are health care (nursing) and business. At the end of 2010, there were nationwide discussions about the excessive number of students in UASs, especially in the fields of Engineering and Business with connection to a problem in funding. It is also noteworthy that UASs currently receive their funding largely based on student enrollment number, a fact that is changing to a more management-by-results approach (Ministry of Education and Culture, 2016a). This has led to an oversupply of UAS-educated people, compared to the needs of the labor market — the unemployment of UAS graduates is 8%, on par with the general unemployment rate. Some cuts to the number of student places were issued by the Ministry of Education, starting with a nationwide cut of 10% applied to the new student intake in 2007 and 2008, and again in 2016.

Today there are 24 UASs enrolling 58 per cent of all new higher education students (Finland Ministry of Education and Culture, 2016). The dual system and higher education in Finland is currently changing and challenged. Between 2009 and 2014, the number of higher education institutions (HEI) declined from 48 to 38 through mergers (Finland Ministry of Education and Culture, 2015). The number of universities went down from 20 to 14 (with four new universities), while the number of UAS declined from 28 to 24 with Lapland Polytechnic being the most

recent merger in the postsecondary vocational education sector. With varying sizes of UAS from 1,200 to 16,000 students, the pressure for further consolidation is likely to continue in the postsecondary vocational education sector to guarantee better quality and cost effectiveness and to offer students greater opportunities for diverse studies (e.g. Kymenlaakso UAS and Mikkeli UAS). UAS are expected to continue to merge during 2017 with the structural reform based on the institutions' own plans (Finnish Ministry of Education and Culture, 2015).

Conclusion

Finland chooses to prepare vocational teachers for the new Universities of Applied Science (UAS), where students are graduates of secondary vocational high schools. These schools were and continue to use more learner-centered and work-based approaches to teaching and teachers in the new UASs needed to have skills to teach this group of students. These teachers experience a great deal of professional autonomy in their work and are engaged in practical research of best practices and local economic development. The institutions have few if any part-time faculty as the UAS control enrollment based on government provided resources which limit the number of persons that can be prepared to enter the workforce or the vocational teaching profession. There is no open access and students are selected for available slots per program each year. Finland experiences a high rate of student satisfaction and degree competition (Ministry of Education and Culture, 2016b).

Finland has expanded and organized needed job training for its growing unemployed youth into a structured national system of postsecondary education. Finland created greater efficiency organically via the way it funded students attending postsecondary vocational education, thus causing institutions to merge with others to survive (Meriläinen & Rökköläinen, 2016). Finland has updated their vocational curriculums as the workplace has changed over the decades, via a dual system of secondary education feeding into the postsecondary system which is also a dual system: academic secondary students go to the University and vocational students go to the University of Applied Sciences. Today, Finland is increasing the amount of required work-based learning to stretch shrinking dollars earmarked for such education. According to Pratt (2006), the challenges for the Universities of Applied Sciences and for the Finnish government is to maintain the distinction between the broad aims of the two sectors (vocational and academic) while recognizing that a difference of purpose does not necessarily imply a difference of status.

As Finland is about the size of the state of Minnesota, we can learn to apply its model at the state level. Technical faculty can apply and receive a grant from Finland to study and teach in the Finnish University of Applied Sciences through the Fulbright

Finland program. Various opportunities are posted on the Fulbright website: <http://www.fulbright.fi/en/grant-programs/for-americans>. Further readings the Finnish educational system and culture may include: Finnish Lessons (Sahlberg, 2015); The Nordic theory of everything (Partanen, 2016); and Teach like Finland (Walker 2017).

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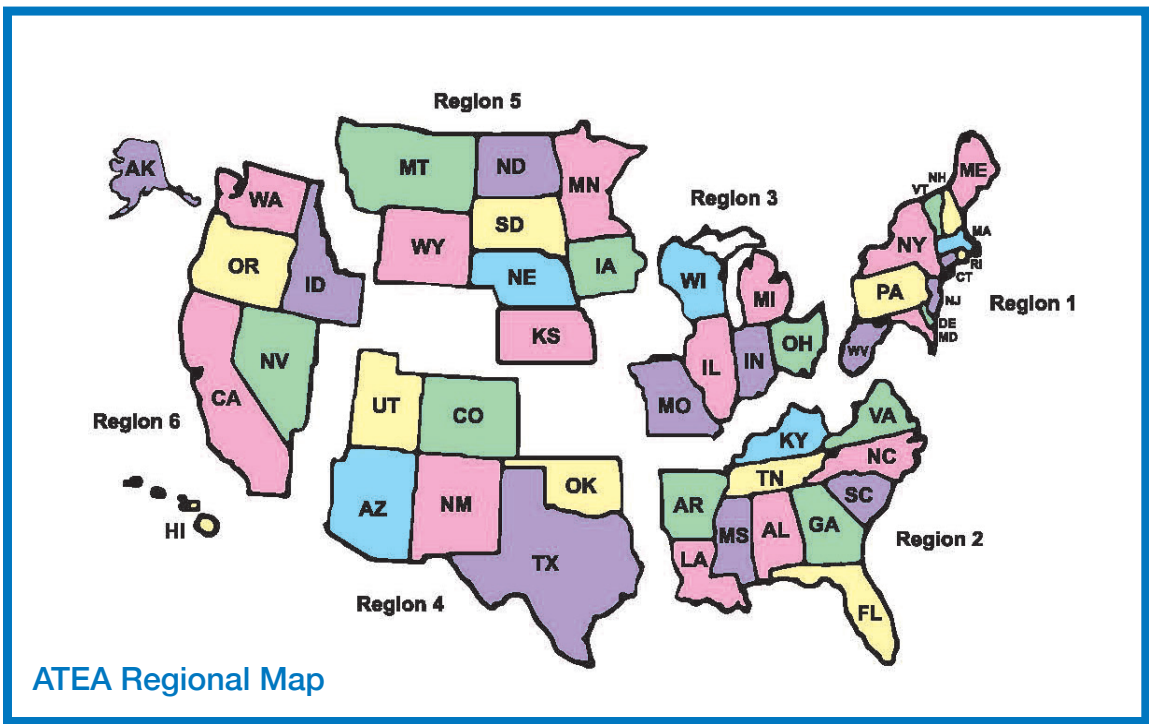


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