

**The Emerging Center for Career and Technical Education Excellence**  
*Working in Partnership to Advance Workforce Education*

---

# **Advancing the Status and Prospects of Career and Technical Education Through Dialogue, Collaboration, and Pooled Expertise**



Advancing the Status and Prospects of Career and Technical  
Education Through Dialogue, Collaboration, and Pooled  
Expertise

A report from the second annual CTE Summit at the  
University of Wisconsin-Stout  
June 19-20, 2017

The following Career and Technical Education faculty at the University of Wisconsin-Stout contributed to the writing and editing of this monograph:

Barbara Bauer, Technology Education

Dr. Kathleen Brock, Career and Technical Education

Dr. Urs Haltinner, Career and Technical Education

Dr. Diane Klemme, Family and Consumer Sciences

Dr. Brian McAlister, Technology Education

Dr. Deanna Schultz, Career and Technical Education

Dr. Matt Simoneau, Career and Technical Education

Dr. Debbie Stanislawski, Marketing and Business Education

Dr. Sylvia Tiala, Technology Education

Dr. Kenneth Welty, Technology Education

Assisted by Heather Knutson



Content in this paper is licensed under a Creative Commons Attribution 4.0 International (CC by 4.0) license, which allows use of the work as long as credit is given to the author.

# Preface

Part of the mission of the University of Wisconsin-Stout is to provide applied learning to help “grow the economy and serve a global society.” This is a collaborative endeavor involving outreach to our workforce development partners as well as engagement among students, staff, and faculty. Together we can develop effective solutions to the issues we face.

The 2017 Career and Technical Education (CTE) Summit was an opportunity for workforce education stakeholders to collaboratively engage in discussions about the future of career and technical education. This event was consistent with UW-Stout’s historic commitment to career and technical education through its polytechnic vision and its roots in addressing societal and economic needs. In fact, the university is home to a comprehensive array of Career and Technical Education baccalaureate through doctoral degree programs which have direct lineage from the first majors in industrial education and home economics education.

As a participant in the CTE Summit, I engaged with partners who are passionate about preparing young people for a successful future. The information presented in this monograph captures much of the rich conversation that occurred over those two days. I hope readers will consider the insights shared in this document as action items to collectively move career and technical education forward into the future.

Dr. Robert Meyer, Chancellor  
University of Wisconsin-Stout

# Contents

|   |    |
|---|----|
| Preface .....   | 4  |
| Introduction .....  | 7  |
| Methodology .....   | 8  |
| Panel 1: Macro Vision for CTE   |    |
| White Papers  |    |
| <i>A Look Back</i> by Bryan Albrecht .....  | 13 |
| <i>More than Skills</i> by David Hay .....  | 16 |
| <i>Charting our Course</i> by Jay Rojewski .....  | 18 |
| <i>Looking Out Ten Years</i> by Kyle Hartung .....  | 21 |
| Recommendations .....   | 24 |
| Panel 2: A Vision for CTE in Wisconsin  |    |
| White Papers  |    |
| <i>Transformation of PK-12 Career Preparation<br/>        Systems Through Academic and Career Planning<br/>        and Regional Career Pathways</i> by Sharon Wendt ..... | 28 |
| <i>What is the Future of CTE for Wisconsin?</i><br>by Bob Meyer .....   | 31 |
| <i>The Future of Career &amp; Technical Education in Wisconsin</i><br>by Morna Foy .....  | 38 |
| <i>What is the Future Vision of CTE for Wisconsin?</i><br>by Jim Morgan .....   | 40 |
| Recommendations .....   | 42 |

Panel 3: Vision for CTE Teaching and Learning in Wisconsin

White Papers

|  |    |
|--|----|
| <i>What are the best practices in moving CTE forward?</i><br>by Russ Tronsen .....   | 46 |
| <i>The Academies of Racine and Barriers to Partnerships</i><br>by Chris Neff .....   | 48 |
| <i>Utilizing the Living Lab Concept to Transform<br/>Place based Education, Engage Students, and<br/>Provide Budget Relief</i> by Josh Gamer ..... | 51 |
| <i>A Culturally Relevant Design: Reframing,<br/>Reimagining, and Reengineering the College<br/>Transition Process</i> by Lori Suddick .....        | 54 |
| Recommendations .....  | 59 |
| Participants' Vision of CTE .....  | 62 |
| Appendix A: Speaker Biographies .....  | 66 |
| Appendix B: Participant List .....   | 71 |

# Introduction

A Career and Technical Education (CTE) Summit was convened Monday and Tuesday, June 19-20, 2017, at the University of Wisconsin-Stout. Attendees included invited local, state and national thinkers sharing insights across Midwestern PK-16 high schools, technical and community colleges, departments of education, departments of workforce development, regional economic development centers, and national think-tank leaders.

The focus:

- Preparing graduates for current and emerging needs and challenges in the workplace
- Envisioning the future of career and technical education in Wisconsin
- Establishing best practices to move the field forward

The goal: To advance the status and prospects of career and technical education through collaboration, dialogue, observation and listening.

In an effort to accomplish the goal, UW-Stout faculty strategically identified stakeholders representing each of the university's CTE programs.

In the process, UW-Stout leaders along with faculty across the university's CTE programs took on the researcher role. This included facilitation of breakout sessions in an effort to capture frontline practitioner voices as they contemplated a future vision for CTE. The outcomes are the ideas, themes, and illustrations distilled from each of three-breakout sessions.

This monograph represents the compilation of stakeholder voices captured through structured debriefing sessions. Themes and illustrations were analyzed through a methodical reduction process. The resulting recommendations for CTE as a system, programs, and teaching and learning in CTE are presented in the format of a macro vision of CTE, a vision for CTE in Wisconsin, and a vision for CTE teaching in Wisconsin.

# Methodology

The UW-Stout 2017 Career and Technical Education (CTE) Summit provided an opportunity for various workforce education stakeholders to dialogue about career and technical education and what it might look like in the future in Wisconsin. The summit followed an intentional, structured agenda, and a qualitative process was used to gather input from participants as well as analyze the ideas collected. The process for identifying participants, collecting their ideas and analyzing them are provided in the following paragraphs.

## **Participants**

All UW-Stout CTE faculty were involved in identifying individuals to participate in the summit. While faculty sought to include as many diverse perspectives among participants as possible, the number of participants was limited by space available. All individuals who were invited to the UW-Stout 2016 CTE Summit were invited to participate in the 2017 CTE Summit. Based on feedback from the 2016 participants, the participant list was expanded in 2017 to include advisory committee members selected by program directors from the BS Family and Consumer Sciences, BS Marketing/Business Education, BS Technology Education, BS Career and Technical Education, MS Career and Technical Education, and EdD in Career and Technical Education programs. Email invitations and follow-up emails were sent to everyone on the list of prospective participants. Those who accepted the invitation were sent an email confirmation along with a web link where documents were available for review prior to the summit. A complete list of the 2017 CTE Summit participants is included in Appendix B.

## **Procedures for Engaging Participants and Gathering Ideas**

The 2017 CTE Summit agenda included three panels of thought leaders to engage participants and challenge their thinking. The first panel of individuals brought a national perspective to the CTE Summit and were invited to share their thoughts in response to the question: Looking out 10 years, how do we groom talent to meet the needs/current/emerging challenges in the workplace? The second panel consisted of state level CTE leaders from UW-Stout, Wisconsin Department of Public Instruction, Wisconsin Technical College System, and business/industry economic development. This panel responded to the question: What is the future vision of CTE for Wisconsin? The final panel consisted of practitioners – a high school administrator and former CTE teacher, a large school district CTE Coordinator, a technical college dean, and a technical college vice president – who are leading unique initiatives involving CTE in their institutions. The question this panel addressed was: What are the best practices in moving CTE forward? Invited panelists are listed in Appendix A.

Each panelist wrote a two-page paper in advance of the CTE Summit, addressing the question posed to them. These papers were shared with participants via a web link prior

to the summit. Each panelist also prepared a 10-minute “TED talk” style presentation that was delivered during the summit.

Following each of the three panel presentations, participants moved into small groups for breakout discussions; these groups were considered focus groups for purposes of analysis and dissemination of findings from this summit. Each breakout group consisted of ten to eleven individuals with differing backgrounds. For example, one group included a technical college president, a university dean, a high school principal, a high school assistant principal, a CTE Coordinator, a CTE teacher, a legislator, and a representative of Wisconsin’s school counselor association.

Each breakout group was facilitated by a UW-Stout faculty member who taught and/or served as program director in one of the undergraduate or graduate CTE programs. Each facilitator was provided with a set of discussion questions that was developed based on the papers written by the panelists. During the first breakout session following the initial panel, participants considered the question: Given what you heard, what are the implications for preparing students for a career in the emerging world of work? Participants were asked to consider the question individually first, then share their ideas in small groups, organizing ideas by theme. Following small group discussions, a spokesperson from each group shared the main themes from their group. Participants were then asked to individually draw their vision of career and technical/workforce education 10 years from now. They shared their visions with one another as time allowed and kept their drawing for use in the following breakout sessions.

Breakout groups included the same participants following each panel. During the second breakout session, participants were asked to make changes to their drawing from the previous breakout session by considering what they heard from the second panel that shifted their thinking about career and technical/workforce education and career preparation as it impacted their vision. These visions were then shared with the large group. Following this time of sharing and discussion, participants discussed the question: To what extent can secondary and post-secondary CTE programs effectively prepare students for immediate employment in shortage areas while at the same time providing them with the intellectual tools and transferable skills needed to respond to inevitable changes in the workplace? Facilitators captured ideas on poster paper.

The final breakout session following the third panel involved questions for individual and group consideration. Individuals were asked to write on the back of their CTE vision paper their ideas in response to two questions: What role can you play as part of the larger collaborative system of career and technical/workforce education to prepare students for the ever-changing workplace. The question of who else needs to be engaged in making these changes advanced the conversation. After capturing their individual thoughts on paper, participants engaged in a group discussion in response to the questions: How has your thinking been impacted or shifted over the course of the summit? and What opportunities do you see for moving forward collectively to prepare students for an evolving, ever-changing workforce that will be different in 2027 than it is today? The breakout session facilitators again captured the groups’ ideas on poster paper

for all group members to see and suggest revisions as needed. The drawings of each participants' CTE vision were also collected by facilitators.

### **Inquiry Limitations**

Limitations across the inquiry were inherent to the structure and focus of the summit. Expertise of the invited participants, their ideology and role in the Career and Technical Education (CTE) enterprise, impacted responses. For example, Technology Education experts tended to focus on problem solving while Business and Marketing professionals focused on entrepreneurship and work-based enterprise. Additionally, Wisconsin has a strong emphasis on manufacturing. This is evident when looking at state legislative activities, and current news. Many of UW-Stout's partners represent businesses and industries who hire Stout graduates.

The universities' comprehensive array of CTE programs serve as a pipeline to manufacturing, business, and industry and the associated educational institutions such as K-12 and technical college partners. While it is recognized that there are sixteen career clusters (see <https://careertech.org/career-clusters>) the direction of this summit focused on the Education & Training, Manufacturing, Business Administration and Management, and Marketing career clusters.

The service sector, health care, restaurant and hospitality, grocery stores and the like were less overtly addressed by the makeup of attendees and invited experts. However, their voice was present through Marketing Educators and Family and Consumer Science Educators. In addition, there was an absence of planned engagement of stakeholders who deal with poverty, homelessness and abuse. These issues may impact the ability of business and industry to attract a viable workforce. It seems easy to focus on tangible products whose cost/profit ratios can be easily measured. Yet, with an aging population and advances in genetics, artificial intelligence, gaming, electronics, biotechnology, food production, etc., a large portion of our potential audience remained ignored.

Individuals representing the arts and humanities were minimally represented at the CTE summit. It should be recognized that the arts and humanities support, and are part of, business and industry. Vibrant community development projects like Eau Claire, Wisconsin's Confluence Project, encourage jazz festivals, art festivals, poetry readings, plays, band concerts, and other arts related events. All contribute to a quality of life that helps attract and support employees for manufacturers and businesses. Additionally, the social sciences, arts, and humanities contribute to employers such as game design companies, agriculture companies, insurance companies, graphic design companies, and data analysis users (weather, insurance, police departments, agriculture) that use graphic arts, communication, and historical analysis to as part of their business and industry. This is consistent with a futures of work projection (International Center for Leadership in Education) and reinforced within the foundational skills detailed through P21 (Partnership for 21st Century Skills)

Thus, the CTE Summit and resulting inquiry limited itself, its scope, and its potential impact through its limitation of the holistic community and societal contexts in which CTE exists.

# Panel 1: Macro Vision for CTE

The first set of panelists for the 2017 CTE Summit were selected for the national perspective they could share regarding CTE and the direction it is headed in the future.

The invited panelists were:

Dr. Bryan Albrecht, President and CEO, Gateway Technical College

Dr. David Hay, Director of Organizational Effectiveness, New York City Schools  
Department of Education

Dr. Jay Rojewski, Professor, University of Georgia

Dr. Kyle Hartung, Pathways to Prosperity, Jobs for the Future Director

Each of the panelists was asked to respond to the question: Looking out 10 years, how do we groom talent to meet the needs/current/emerging challenges in the workplace? The panelists' thought papers, written in their own words in response to this question, are presented in the following pages.

## **2027: A Look Back**

Dr. Bryan Albrecht, President and CEO  
Gateway Technical College

The year is 2027 and the world has changed. The only thing is... we have not changed with it. When I say we, I mean those of us that have, for the most part, completed our formal education and may have established permanent parameters in our thinking about how new knowledge and skills are obtained. In general, many in the education community believe we understand the personal and cultural changes that have impacted the lives of those growing up in this new world. We live in 1987 or if lucky 2007 and are expected to educate youth in 2017. To begin the 2027 discussion of nurturing talent to meet the current and emerging needs/changes in the workplace, we must first look back 10 years to measure how successful we have been in preparing today's workforce.

In 2007 we are experiencing one of our nation's greatest skilled worker shortages in modern history (Bunshaft, 2017). This is impacted by demographics, immigration, technology integration, education policy and a variety of social adaptations and beliefs of what we value as Americans. In 2007 the education community was immersed in a report titled Report of the Academic Competitiveness Council (U.S. Department of Education). The report emphasized the importance of preparing a new generation of youth with workforce skills that were embedded with workplace skill requirements and critical thinking. Some say it launched the STEM movement. Officials from federal agencies with education programs aimed at improving America's competitiveness in science, technology, engineering and mathematics engaged in a yearlong endeavor to assess their programs' success and identify areas for improvement for current and future programs. This effort, carried out by the Academic Competitiveness Council and led by the Secretary of Education, Margaret Spellings, laid the groundwork for sustained collaboration among STEM education programs across federal agencies that were to strengthen America's competitiveness. (Spellings, 2007). The goal was to better align federal investments and prepare future employees for globalization and technology integration.

Over the last 10 years, many efforts have been made to break down some of the barriers that prevent our education and social systems from adapting to the rapid changes in the economic globalization of the world of work. Some examples of this effort include the Khan Academy. A non-profit educational organization created in 2006 by educator Salman Khan with a goal of creating an accessible place for people to be educated. The organization produces short lectures in the form of YouTube videos. The website today is available in English, Spanish, Portuguese, Turkish, French, Bangladesh and Hindi. This alone should give us insight to the future.

Today in 2017 while the Khan Academy is effective it has not generally transformed the American public education classroom and STEM education is still grossly unfunded and often taught through extracurricular activities. All of this could be deflating if the answer is looked at as a myopic strategy or single point of reference. Today we are faced with balancing a rapidly changing workplace skill set with political pressure to fill jobs with highly educated employees. Building a better mousetrap begins with understanding what we are trying to catch. The jobs of the future will shape the

education models of the future and since the graduating workforce of 2027 is currently in the second grade we must act quickly in understanding the workforce skills of the future.

Deloitte Consulting through Deloitte University Press frames this future as Industry 4.0. Industry 4.0 encompasses a promise of a new industrial revolution. One that marries advanced manufacturing techniques with the Internet of Things to create a digital manufacturing enterprise that is not only interconnected, but communicates, analyzes and uses information to drive further action back to the physical world. Examples of this revolution are all around us, but do we recognize them. Self-driving cars and smart pills aerospace guidance systems are just a few. FANUC Robotic Systems are common in many secondary and post-secondary technology and engineering classrooms and provides a proven base to teaching robotics systems and programming. FANUC has tens of thousands of robotic systems deployed in corporations throughout the world. Their success lies in the interconnected data systems that transmit the robot's performance every 90 seconds to FANUC engineers to establish predictive analytics and smart performance systems. The power of the robot is not only in the repetitive tasks performed, but in the self-analysis of its ability to improve production and economic efficiency.

How does FANUC, self-driving cars and Industry 4.0 provide insight to the future of talent development? If we are going to succeed in preparing students with skills necessary for workplace success we must understand the work environment and the systems that shape its future. Integrated systems thinking that is driven by data and competency in information technology is the new basic skill set.

Preparing students for the dynamic technology driven workplace will take an equally dynamic learning environment. I offer the following four recommendations as strategies to improve education and workforce preparation:

1. Support the integration of science, technology, engineering and math built upon a foundation of information and data systems.
2. Create dynamic learning environments that leverage student interest in technology as a learning tool.
3. Develop "just in time" learning strategies over traditional course structures.
4. Engage in contextual learning activities that are designed in partnership with industry.

These are not new ideas for many educators, but when reflecting on how they may be applied over the next 10 years, new opportunities present themselves. Opportunities like cloud computing, additive manufacturing, augmented reality, Big data, simulation, learning system integration, and the Internet of Things. New social and economic structures used by business, industry, healthcare, finance, government, transportation are rapidly changing the way we live and interact with the man made environment. How will our education sector measure up in this new economy or better how will your students compete for jobs in 2027.

## References

ACT, Inc. (2014). *The condition of STEM report 2014: National*. Retrieved from <http://www.act.org/content/dam/act/unsecured/documents/National-STEM-Report-2014.pdf>

- Albrecht, B., Gateway Technical College. *Growing the economy by up-skilling the American worker techniques*. Retrieved from [www.aceonline.org](http://www.aceonline.org)
- Bunshaft A., President, Dassault Systems America. Interview May 15, 2017.
- Carnevale, A., Smith, N., & Strohl, J. (2013). *Recovery: Job growth and education requirements through 2020*. Washington, DC: Georgetown University. Retrieved from <https://cew.georgetown.edu/cew-reports/recovery-job-growth-and-education-requirements-through-2020>
- Deloitte University Press. (2017). *Industry 4.0*. Retrieved from <https://www2.deloitte.com/insights/us/en/focus/industry-4-0.html>
- Khan Academy. (2017). Retrieved from [www.khanacademy.org](http://www.khanacademy.org)
- Morgan, J. (2015). *Advancing a jobs-driven economy*. Washington, DC: STEM Higher Education Council.
- Rothwell, W., Gerty, P., & Carraway, V. (2017). *Community college leaders on workforce development: Opinions, observations, and future directions*. Lanham, MD: Rowman & Littlefield.
- U.S. Chamber of Commerce Foundation. (n.d.) *Talent pipeline management - Case studies*. Retrieved from <https://www.uschamberfoundation.org/talent-pipeline-management>
- Wikipedia. (2017, May). Industry 4.0. Wikipedia. Retrieved from [https://en.wikipedia.org/wiki/Industry\\_4.0](https://en.wikipedia.org/wiki/Industry_4.0)

## More Than Skills

Dr. David Hay, Director of Organizational Effectiveness  
New York City Department of Education

Over the last decade we've seen significant national attention and investment in fields like STEM, and Computer Science. This push to re-engineer the talent pipeline for our changing global economy is well-intentioned, albeit only half of the equation. What's missing? Investment in learning designed to develop inquisitive minds, strategic thinkers, and courageous leaders.

The knowledge economy, as it has been called, relies less and less on traditional manufacturing, and more and more on intangible goods like software and code. At the heart of this transition is a sea change in the American workforce. Communities built around factories find themselves in disarray alongside the shuttered assembly lines. Leaders in Washington, and across the country, have called for a retraining of the workforce. They rightly call out the burgeoning growth in computer science and other STEM-related fields. For many, the tech revolution that we are in the midst of may hold the same promise that the industrial revolution did in terms of solidifying America's status as a global economic superpower.

For all of the credit due to the American worker, it was the innovators, the entrepreneurs, the scientists, and the inventors who we need to learn from. And yes, of course, sometimes the best inventions came from those working the line. But the real point here is that if we allow ourselves to focus so intently on skills that we lose sight of the ideas necessary to achieve breakthroughs, we lose the essence of America.

Focusing only on the technical aspect of the future – coding – without the entrepreneurial spirit is a recipe for stagnation and ultimately decline. Knowing how to code is certainly a gateway to a job with a decent expected wage for the foreseeable future. And if that is the version of the American Dream we are satisfied with, we can stop here. Yet, if we believe that the real promise of the future is not in what we can do, but rather what we choose to do, then the notion of coding, alone, falls woefully short.

To not only survive in the knowledge economy, but also to thrive, I argue that students need five essential abilities. These abilities reach beyond the scope of skills. I suggest a state of mind, an approach to the world, and the ability navigate a world that is growing infinitely more complex. I suggest students need the ability to:

- Embrace ambiguity
- Identify problems
- Develop solutions
- Lead people
- Reflect and grow

It is important to remember that Career and Technical Education at its inception was invented as a mechanism to prepare students for burgeoning factory floors. These high-skill, high-demand jobs of the past were key pathways to the middle class. Over time CTE has evolved, and as it has, at its best it has embraced the challenge of adaptability. At its worst it has clung to memories of a bygone era, and slowly faded away.

The best preparation for an unfolding future is the ability to *embrace ambiguity* and to navigate uncertainty. It has become increasingly difficult for economic forecasters to predict exactly what jobs and careers will be in demand decades from now. The challenge educators face today is preparing students for an uncertain world.

But let's stick with CTE at its best. Where it has grown strong and evolved with the local community, CTE students are not only prepared with employable skills, but with deep *understanding of the problems* the community is facing, and the ways entrepreneurs are trying to *solve those problems*. At our best, CTE students are valuable assets because of the perspective they bring, not simply their understanding of content knowledge or skill in a shop. Traditional education does the opposite. Our system of education relies on experts in the form of classroom teachers. We train teachers to develop clear scope and sequence; we use words like scaffolding, rubrics, and standards. If these are the only tools we rely on, then to paraphrase John Dewey we are preparing students not for their future, but for our past.

Ultimately, even having great ideas is not enough to impact the world in meaningful ways. For those ideas to translate into change, our students must understand human behavior and must hone their ability to *lead people*. Marshal Ganz defines leadership as “accepting responsibility for enabling others to achieve shared purpose under conditions of uncertainty.” Students must have the ability to navigate uncertainty individually, and the ability to assist others.

Of course, at the heart of all of this is the ability for an individual to continuously *reflect, grow, and hone* their individual performance. To navigate ambiguity, one must constantly examine the landscape and adjust. To identify and solve problems one must find the ability to see the world with new perspective. To lead people, one must remain in a constant state of curiosity about individuals and groups. This is no easy task to be certain.

### **So how do we get there?**

Start asking questions we don't already know the answer to. Make learning real, not just simulated. So long as we limit students today to the answers we have already codified, we are depriving them of the training necessary to navigate and invent the future. It should be no surprise that so many iconic inventors and entrepreneurs found their way out of traditional education systems. Traditional education acts as a limiting force, but it could be reimaged as an ever-expanding force – if we are willing to embrace the ambiguity that comes with no longer being the expert. In a system built for the future learning is messy, the path unclear, failure is expected, iterate is the word of the day, strategy is paramount, and reflection is infused into daily activity.

# Charting our Course: Career-Technical Education in the 21st Century

Dr. Jay W. Rojewski,  
University of Georgia

## Introduction

We are approaching a critical threshold in the way we design, prepare for, and engage in work. Increasingly rapid technological changes are altering fundamental changes in how work, both blue-collar and white-collar, is accomplished. Ever more intelligent machines are demanding that workers develop skills and competencies that differ markedly from those required over the past century. The hallmarks of work in the 20th century—definability and predictability—are giving way to work characterized by rapid change and unpredictability.

Today, occupational prospects seem far less definable or stable than in the past. These changes pose difficult challenges for career and technical educators (CTE) and others who ask, “*How can we best prepare people for work when, in many cases, the jobs those people will perform do not yet exist?*” To remain relevant in this emerging landscape, a framework is needed to structure and guide research and curriculum development. Three key components—career navigation, work ethic, and innovation—are presented as a way to frame CTE curricula that anticipates increasingly rapid changes in workplace demands and ensures student outcomes that will be lasting and durable in the 21st century workplace.

## Work of the Past

The key descriptors of work since the advent of the Industrial Revolution have been *slow but steady growth*, *predictability* and *localized transactions*. Here are a few other characteristics of work that have existed and supported the development of work preparation efforts since the early 1900s:

This is the world where vocational education in the U.S. was developed and has existed for the past 100 years; a world where work was *stable*, *predictable*, and *dependable*; a world where job skills were knowable, (semi-)permanent, and could be taught to a new generation of workers.

|                                |                                  |                                   |
|--------------------------------|----------------------------------|-----------------------------------|
| Stable/long-term               | Loyalty from company and workers | Dependable work                   |
| Benefits                       | Cradle to grave                  | Local                             |
| 8hr per day/5 days per week    | Predictable, knowable job duties | Lower intellectual skills okay    |
| PS education <u>NOT</u> needed | Production jobs more plentiful   | Minimal need for <i>retooling</i> |
| Personal network of friends    | Young workers                    | Union-friendly                    |

## Emerging (and Anticipated) Reality

**Changes.** The rapid advancement of technology is a primary reason for emerging and anticipated changes to work and society. While not new, something is fundamentally different about our current experience with technology growth, i.e., the cumulative effects of exponential technological growth known as *Moore’s law*. Exponential growth means more and faster advances in technologies that will affect every aspect of our lives.

So, what does this mean and why is it important? Emerging technological changes will touch every area of life and work.

**New Worker Demands.** Ever-smarter technologies will replace many facets of routine and not-so-routine work in the near future. Specific technical skills will change, rapidly relegating skills training to short-term solutions at best. Work demands in the 21<sup>st</sup> century will include skills such as:

- 
- |                 |                   |                               |
|-----------------|-------------------|-------------------------------|
| • Self-reliance | • Self-Management | • Flexibility                 |
| • Initiative    | • Decision-making | • Work with diverse people    |
|                 |                   | • Ability to think and reason |
- 

**Emerging Patterns of Work**

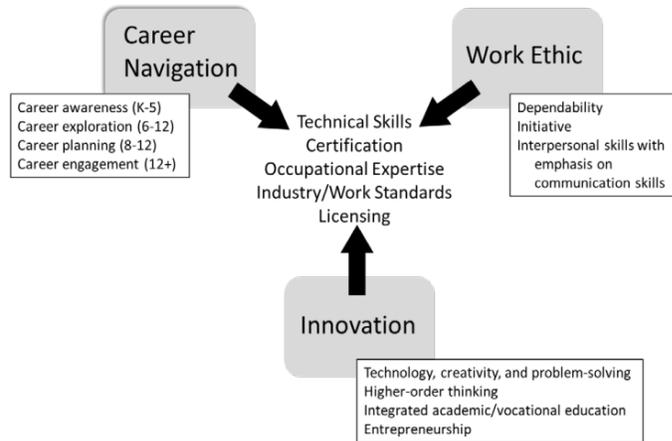
Key descriptors for emerging patterns of work will be *rapid and exponential growth*, *unpredictability*, and *globalized transactions*. Here are a few other characteristics reflecting the emerging world of work:

- 
- |  |  |   |
|--|--|---|
| • Short-term/project-based             | • Part-time, transient                   | • Sporadic, subject to economy          |
| • Global                               | • Fewer jobs with benefits               | • Contract work                         |
| • International / global               | • 24/7                                   | • Rapidly changing, hard to know future |
| • Higher intellectual skills necessary | • Older workers                          | • Increasingly technology-dependent     |
| • Social media                         | • Constant retooling ~ Lifelong learning | • Greater competition (fewer jobs)      |
| • Union-unfriendly                     |  |   |
- 

Rapid and constant technological change is one of the few certainties in the 21st century workplace, ensuring that the period during which technical skills remain relevant will continue to shrink. The need to re-train consistently throughout one’s work life will place additional pressures on employees to stay current. Further, workers will assume more responsibility for securing and managing services and support they once received from employers like health insurance, retirement, and secure, employment.

**Work Preparation in the 21st Century**

Historically, vocational education assumed that (a) knowable and teachable work skills existed, (b) training was primarily technical in nature and constrained to less than a 2-year postsecondary credential, and (c) work skills could be taught to the next generation of workers. While not easy to consider, these long-held assumptions and our paradigm about work and work preparation must be reconsidered. To begin thinking differently about preparing young people for postsecondary education and work, three aspects of work—*career navigation*, *work ethic*, and *innovation*—should be emphasized in the design, delivery, and assessment of work preparation programs.



## Conclusions

A broader discussion about the impact of emerging technologies and societal changes on the world of work and work preparation is essential. What is the mission of CTE in this changing landscape? A *collective response* to current and anticipated changes in work and the workplace is essential. A positive first step is to identify the role that three essential themes—career navigation, work ethic, and innovation—will play in developing or modifying CTE curriculum.

At first thought, these themes may not seem much different from what is already done. But the act of refocusing the purpose of CTE curriculum is different. Rather than structuring CTE curriculum with specific work skills as the end goal, emphasis of the three proposed themes can *promote more comprehensive and inclusive program goals*, and enhanced knowledge and skills. The point to make is that even as new occupations emerge and content area programs strive to have the most up-to-date occupational cluster or program of study, a framework incorporating career navigation, work ethic, and innovation can serve as a nucleus to preserve the relevance of CTE for decades ahead. Conditions in education and in work increasingly require that CTE professionals align their thinking around three themes—*career navigation, work ethic, and innovation*—that will be important, durable, and universal for success in the 21st century workplace.

# Looking Out 10 Years: How Do We Groom Talent to Meet the Current and Emerging Needs and Challenges in the Workplace?

Kyle Hartung, Director, Pathways to Prosperity  
Jobs for the Future

Despite our best intentions and loftiest visions, our nation continues to struggle with a deep misalignment between what the workforce needs and how young people are prepared for careers. Amplifying the urgency of this problem, the rapid changes in technology taking place will only continue to accelerate—compelling us to address, today, the effect these changes will have on both employers and workers, tomorrow. For 35 years, Jobs for the Future (JFF) has pursued and scaled approaches to prepare employers and workers for just that, the jobs of the future. We listen to what employers need, study labor market trends, and look ahead to what’s next.

The challenge before us today—how to groom talent to meet the current and emerging needs and challenges in the workplace—is not different, except that this is not really a question about jobs. It is instead a question about skills and the Future of Work, a question that JFF is considering deeply. What are the skills the Future of Work will demand, and how can we collectively ensure that all young people are prepared to launch rewarding careers in the future workplace? The Future of Work will require skills, more than ever before, that allow workers to be nimble, flexible, and adaptable to changing roles, paths, and economies. As such, this is not about job preparation, but about career preparation and the required credentials that account for new skills and that hold value in the labor market. However, the pipeline of talent from education systems into the workforce has never been seamless, which ultimately limits advancement for workers and employers, and the Future of Work presents new considerations to this already complex endeavor.

To consider the Future of Work means we must consider how jobs, and the nature of work itself, are changing. For instance, automation is changing the economy in fundamental ways, which will radically shape the types of jobs that will be available in the future, as well as affect workers who are already struggling to gain a foothold in the new economy. Multiple sources point to millions of jobs and job tasks, particularly at the entry level, being displaced by automation in the coming years. In fact, research suggests that the demand for workers to fulfill roles in no routine analytical and interpersonal job tasks in the workplace rose in the last 50 years, alongside the diminishment of routine workplace tasks,<sup>(1)</sup> and this trend is only expected to increase in the next decade. Jobs that do not rely on sophisticated social skills and that are routine in nature are those most likely to be automated—and these are often the jobs held by young people and low-skilled adults as they enter the workforce and gain the skills needed to advance up a career ladder. Taken together, these trends suggest that a successful career arc in the near- and far-term will require mastery of a body of transferable skills (i.e., employability skills) that can be deployed in a variety of job setting. Existing socioeconomic inequities may deepen and widen into the future unless we create stronger and more seamless connections between career preparation and the workforce.

While these systems-level changes may seem daunting, we propose a number of concrete, immediate, evidence-based strategies that employers and the people who prepare and support workers can collaborate on to improve outcomes for workers. JFF’s partnership and coalition building work at the local, state, and federal levels brings together key stakeholders from business, government, education, and workforce; and yields insights regarding how we can move the needle, systematically, to groom talent for the Future of Work. Two interrelated strategies, in particular, are critical.

The first strategy is to directly emphasize the cultivation of foundational employability skills (e.g., leadership, teamwork, communication, problem solving, work ethic, initiative, adaptability, etc.)—alongside and integrated with both technical and rigorous academic skills—that are valuable to employers across all sectors and difficult to automate. (ii) Such skills can directly influence an individual’s ability to remain relevant, versatile, and employable in the face of economic and industry shifts. Additionally, as companies respond to the pressure to innovate and use technology in creative ways to increase efficiency or scalability, employers are looking for all workers to understand and apply the principles of entrepreneurship to solving problems, weighing costs, thinking creatively, and executing ideas successfully. Of course, these skills are most effectively observed, learned, and demonstrated in a work-based environment. However, to effectively see these skills instantiated in practice, we also need to reinvent curricular content and design in order to incorporate and align emergent technical skills with rigorous work-based learning experiences that provide young people with access to the unknown “black box” of the world of working adults. To do this well requires us to abandon a traditional and deeply ingrained model of teaching and learning that is predicated on a belief that we must first learn about something before we can learn to be something. The socio-cognitive theory of learning (i.e., situated learning) inverts this model to posit that it is through learning to be (i.e., thinking like an engineer; using the tools of an engineer; etc.) that we begin to learn about. (iii) Put another way, we don’t learn how to be engineers by studying engineering; we learn to be engineers by doing things that engineers do.

The context in which the first strategy can occur gives rise to a second strategy, namely to focus on designing and implementing systems, not programs. Specifically, we must set the goal of ensuring that youth and adults do not fall out of the education and career preparation system without achieving a credential or degree with value in the labor market—a reality that severely limits their ability to succeed in today’s knowledge-based economy. This goal is accomplished by developing and expanding regional ecosystems of college and career pathways that accelerate attainment of secondary and postsecondary credentials and degrees with strong labor market value, while also laying a foundation to enable workers to return to education and training to stay competitive in a changing economy. Such pathways should be co-designed by key representatives in the K-12, postsecondary, and workforce sectors to accelerate student progress to credential attainment; provide a transparent progression to the next level; integrate work-based learning and career exploration; and lead to stackable credentials with value in the labor market. In doing so, a foundation for further education and onramps to careers with advancement potential can be established, in turn creating opportunities for ongoing skill advancement and long-term career growth.

The future can't wait. In order to respond to the current and emerging demands in the workplace, the time is now to lead bigger and bolder systems change and transform how workers are prepared for careers and ensure they have the skills to cultivate lifelong learning and have continued success.

#### **Works Cited**

- i Autor, D. & Price, B. (2013). *The changing task composition of the U.S. labor market: An update of Autor, Levey, and Murnane* (2003). Retrieved from <https://economics.mit.edu/files/11661>
- ii National Association of Colleges and Employers (2015). *Job outlook 2016: Attributes employers want to see on new college graduates' resumes*. Retrieved from [www.nacweb.org/s11182015/employers-look-for-in-new-hires.aspx](http://www.nacweb.org/s11182015/employers-look-for-in-new-hires.aspx)
- iii Thomas, D., & Brown, J.S. (2009). Why virtual worlds can matter. *International Journal of Learning and Media*, 1(1), 37-49.

The author would like to gratefully acknowledge the thoughts and words of his colleagues across JFF that informed the development of, and found their way into, this paper.

# Recommendations

All poster paper notes from each breakout session were transcribed and combined in an electronic document by Breakout Session 1, Breakout Session 2, and Breakout Session 3. Faculty who facilitated the breakout sessions reviewed the transcribed notes for clarity. They then analyzed the notes and individuals' CTE vision diagrams to identify themes which could be synthesized and reported along with recommendations.

Following the first panel, participants moved into breakout groups and were asked to reflect on the following question: Given what you have heard, what are the implications for preparing students for a career in the emerging world of work?

The following recommendations for steps to move CTE forward reflect participants' reactions to panelists' remarks.

## **Adaptive CTE**

***In order to meet the emerging demands of the workplace, career and technical education needs to be more flexible, nimble, seamless, accessible, personalized, and ultimately, sustainable.***

The current career and technical education system has served the community for over 100 years. While this system has remained relatively constant, the world of work has undergone rapid and dramatic change and is envisioned to continue to evolve at an unprecedented rate. CTE needs to be flexible and nimble to keep pace with a dynamic workplace due to continual advancements in technology in a global economy. Delivery systems and teaching approaches need to allow for innovation to respond to the ever-increasing demands of the world of work. The system will not only need to change, but to be able to change quickly. The curriculum and instruction need to be coherent and integrated to achieve the synergy needed to create rich and seamless experiences for the learner. As students prepare for the world of work, learning experiences need to be accessible by overcoming constraints of time, location, and affordability. Furthermore, learners need to be able to customize their learning in accordance with their individual needs and unique circumstances. These activities need to be sustainable; therefore, the design of the system needs to account for limitations of time, money, and talent with an emphasis on gaining efficiency.

## **Transferrable and Enduring Skills**

***Career and technical education needs to groom a workforce that has transferable and enduring skill sets (e.g., character, adaptability, ...)***

One of the major concerns expressed by employers is the need for a workforce that exhibits a transferable skill set that will enable employees to adapt to their rapidly changing workplace. Employers are looking for individuals who exhibit traits including self-awareness and social-emotional intelligence. This will allow employees to be

prepared to cope with and adapt to change in a global and interconnected world of work. This navigation of ambiguity requires both the ability to take risks and collaborate with others. Fewer routine tasks and the increased use of technology in the workplace require individuals to generate multiple solutions to any given problem. These skills and traits applied in the workplace will allow for leadership potential and growth.

## **Pathways**

*The students' journey through career and technical education requires early and ongoing instruction that progresses from career awareness to career exploration and ultimately, to occupational preparation.*

Given rapid changes in the workplace, students may struggle to recognize the breadth of career opportunities available to them. Throughout the course of their education students need instruction that helps them uncover their talents and interests, learn about the nature of work being performed around them, sample a wide variety of careers opportunities, and make informed decisions about an occupational focus. These experiences need to include up-to-date instruction, authentic laboratory and clinical experiences, work-based learning, participation in Career and Technical Student Organizations (CTSOs), and pursuit of further education. Together the avenues of learning need to be a coordinated effort to facilitate self-discovery, immerse students in learning, build knowledge and develop skills, and prepare them for the current demands of the workplace.

## **Partnerships**

*The success of career and technical education in addressing both student and workforce needs depends upon the development of partnerships that engage a wide range of stakeholders.*

Preparing students for employment in the 21<sup>st</sup> century is complex and demanding work that requires a team effort. The team needs to include representatives from educational institutions, business and industry, parents and guardians, policy-makers, and other interested parties. The inclusion of these groups is important because of the value they contribute in planning and executing career and technical education. This work requires information that accounts for diverse perspectives that can only be achieved from a broad base of partners. In addition to exchanging of information, partners can inform perceptions, identify current skill demands, leverage resources, harness talent, provide learning opportunities, and create synergies. Career and technical education can accomplish more if everyone works together to prepare people for the world of work.

## **Lifelong Learning**

***Career and technical education needs to prepare students that can build upon their knowledge and skills to enhance their performance, adapt to change in the workplace, and grow as professionals.***

Given the rapid pace of technological advancement and the increasing demands of a global economy, career and technical education students need to foster how to learn in conjunction with learning an occupation. Toward that end, students need to learn how to embrace change, work outside their comfort zone, and set challenging goals. To achieve their goals, students need instruction on how to seek out sources of new knowledge, develop professional networks, and utilize professional publications. More importantly, they need to discover the intrinsic rewards associated with professional growth. Thus, their education needs to involve reflecting on learning, thinking about their thinking, uncovering the structure of knowledge, discovering how to assimilate new knowledge, and transferring knowledge from one context to another. In other words, students need to learn how to be autonomous learners who are less dependent on formal instruction.

## Panel 2: A Vision for CTE in Wisconsin

The second set of panelists for the 2017 CTE Summit were selected for the statewide perspective they could share regarding CTE and the direction it is headed in the future.

The invited panelists were:

Sharon Wendt, Director of Career and Technical Education, Wisconsin  
Department of Public Instruction

Dr. Bob Meyer, Chancellor, University of Wisconsin-Stout

Dr. Morna Foy, President, Wisconsin Technical College System

Jim Morgan, Vice President, MRA – The Management Association

Each of the panelists was asked to respond to the question: What is the future vision of CTE for Wisconsin? The panelists' thought papers, written in their own words in response to this question, are presented in the following pages.

# **Transformation of PK-12 career preparation systems through Academic and Career Planning and Regional Career Pathways**

Sharon Wendt, Director, Career & Technical Education  
Wisconsin Department of Public Instruction

This white paper discusses how academic and career planning efforts combined with a regional career pathways approach can foster innovation, coordination and collaboration in career and technical education resulting in more opportunities for Wisconsin students to experience college and career success.

## **Background – Problem Statement**

In Wisconsin, there are varied economic and workforce issues that challenge our economic prosperity. Most notable is the shortage of talent in many industry sectors. Employers are reporting a shortage of skilled workers and this shortage is exacerbated in key industry sectors such as advanced manufacturing, healthcare, and information technology. According to the America Works: Education and Training for Tomorrow's Job - An Action Guide for Governors, National Governor's Association, 2013-2014 Chair's Initiative:

Ensuring states' and citizens' future economic prosperity will require significant improvement to the education system and workforce training programs. It will require closer relationships among high schools, colleges, career-tech programs, workforce training providers, and employers.

Wisconsin is known for developing partnerships and collaborations among state agencies, education institutions, community-based organizations, and employers to address these challenges through the development of workforce strategies. One such collaboration is the Governor's Council on Workforce Investment (CWI).

As the state designated workforce board for the State of Wisconsin, this council sets forth a strategic plan to develop and expand strategies to enhance Wisconsin's various workforce systems. In 2013, the council set out to develop a strategic framework and formulate recommendations to align Wisconsin's workforce development initiatives and investments with economic development activities in the state. The 2014-2018 CWI Strategic Plan articulated the current state and problem as follows:

- A demand driven workforce investment environment is essential to develop workforce skills in alignment with economic development needs.
- Job demand will out-pace population growth between now and 2030.
- Changing workforce requirements are a fact of sustainable economic growth and our system must be responsive and nimble to make timely adjustments.
- The lack of public awareness about current and future labor market requirements makes it difficult to have a consistent demand-driven career pathway system.
- Job seeker and student expectations are not matched to the reality of the Wisconsin economy and its current high demand career opportunities.
- Ready to work skills gaps decrease employment readiness.

There were 21 recommendations listed in the CWI Strategic plan and eight of them are directly related to PK-12 education. For example, some of the recommendations illustrated the need for more career awareness and opportunities for every high school student to experience quality work-based learning. In addition, the State Superintendent of Public Instruction, Tony Evers' focus on career and college readiness has illuminated the importance of providing students with a rich, rigorous and well-rounded high school experience with opportunities to develop academic and technical skills, learn through work-based learning, and develop habits such as perseverance, responsibility, adaptability, and leadership. The realization that these skills and experiences are critical to students' post-secondary success has positively positioned career and technical education as a significant education delivery model.

### **Solution**

To build on this career readiness vision, Wisconsin is embarking on two initiatives. These initiatives - academic and career planning and the creation of regional career pathways – are serving to transform how we engage PK-12 students and ensure that all students graduate college and career ready. These initiatives also highlight the role of career and technical education in fostering partnerships and collaborations that create more in-depth career preparation opportunities for students.

### **Academic and Career Planning (ACP)**

Academic and Career Planning is a new statute that public school districts will be required to implement for all 6<sup>th</sup>-12<sup>th</sup> grade students starting the 2017-18 school year. ACP is about empowering all students to successfully transition to adulthood through education and training to careers. It is about re-imagining PK-12 education by equipping students with meaningful and supportive adult relationships and the ability to adapt to opportunities and challenges on their personalized journeys to successful lives. ACP provides the platform to engage multiple stakeholders (parents, community, post-secondary, employers, etc.) in helping students identify their interests and skills, explore careers, and plan for their future. A key message being delivered throughout the ACP process is the value of higher education to gain the knowledge and skills necessary for career success. It also emphasizes how all routes to education and training are honorable – including certificates, diplomas, 2-year and 4 year degrees.

As school districts prepare for implementation of ACP, a statewide software tool (Career Cruising) is available to support the development of a student's academic and career plan. This software tool includes the technological infrastructure to support a business/education partnership portal. This additional access to business and industry professionals will expand opportunities for students to engage in career exploration and deepen their understanding of specific industry sectors and occupations.

### **Regional Career Pathways**

The other initiative – regional career pathways – seeks to transform how we deliver CTE by leveraging the resources and partnerships within a targeted industry sector of importance in a regional economy. While regional career pathways have existed, and actually flourished in Wisconsin over the past several years, the focus has primarily been on adult or dislocated workers. The Wisconsin Technical College System

has been a leader and nationally recognized for work in this area. This “new” effort is to ramp up the participation of high school students in career pathways that have been regionally developed and meet regional labor market demands. These pathways are developed through partnerships with employers and higher education and are intended to provide high school students with multiple options for successively higher levels of education and employment in the target sectors.

This initiative is part of Wisconsin’s New Skills for Youth Grant funded by JPMorgan Chase. Wisconsin is one of ten states receiving almost \$2 million for this effort. The funding is being used to support regional directors in four pilot regions. These regions will undergo a needs analysis and labor market information review to determine specific industry sectors to address. Given the extensive nature with which career pathways have been developed in the technical college system, attention will be placed on leveraging existing partnerships and pathway development. Another priority will be to engage all levels of higher education to build pathways that include 2 and 4 year colleges and universities. Over the course of the next three years, at least three fully developed career pathways, that meet state approved criteria, will be implemented in the four pilot regions. Efforts to expand to additional regions will continue as career pathways are developed and additional partnerships are formed.

### **Conclusion**

There are numerous education, workforce and economic strategies in place in Wisconsin and throughout the country. The two initiatives discussed in this paper represent two large scale investments focused on Wisconsin’s secondary schools and can only be achieved through collaboration and partnerships. As education leaders and workforce professionals collaborate to develop innovation approaches to career and technical education, our students will be the beneficiaries of these new career readiness partnerships.

### **References**

- Jenkins, D & Spence C. (2006). *The career pathways how to guide*. Workforce Strategy Center. Retrieved from <https://files.eric.ed.gov/fulltext/ED496995.pdf>
- National Governor's Association. (2013-2014). *America Works: Education and Training for Tomorrow’s Job - An Action Guide for Governors (2013-2014 Chair’s Initiative)*. Retrieved from <https://ci.nga.org/cms/home/1314/index.html>
- Wisconsin Department of Public Instruction. (n.d.). *Academic and career planning*. Retrieved from <https://dpi.wi.gov/acp>

# What is the Future Vision of CTE for Wisconsin?

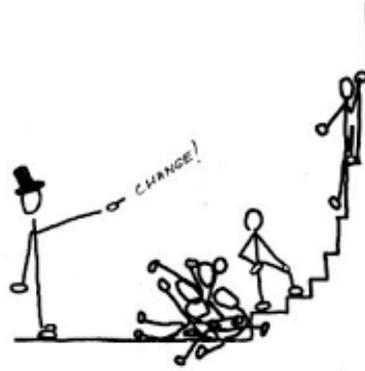
Bob Meyer, Chancellor  
University of Wisconsin – Stout

In preparation for UW-Stout's CTE Summit 2017, I was asked to answer the question "What is the **future vision** of Career and Technical Education (CTE) for Wisconsin?". Before I address that question, I'd like to first address the **future need** of CTE in Wisconsin. In many ways, the historic need for CTE has been a constant and, given the pace of technological change, is more pronounced than ever. UW-Stout's founder, James Huff Stout, saw the acute need for a new model of educating students while managing operations for his lumber business in Missouri in the late 1800s. While in Missouri he witnessed the effectiveness of an applied learning model that was being piloted there and brought it to Menomonie, Wisconsin where he established the Stout Manual Training School. A lot has changed since then, but the core focus of applied learning and preparing students using a CTE approach is as vital now as it was at the turn of the century. UW-Stout, as Wisconsin's Polytechnic University, not only exemplifies delivery of CTE education through its impressive program array but also continues to prepare teachers and administrators for deploying this effective approach in the K-12 and post-secondary environments.

James Huff Stout was a true visionary and saw the need for preparing students with the skills they required to succeed with their career endeavors. As a business leader, he understood that an applied learning approach not only benefited the students, but also served the needs of employers by building a skilled workforce. That basic dynamic is even stronger today than it was in the late 1800s due to a variety of factors including the pace of technological change, demographic shifts, and the growth of our global economy.

## The Pace of Technological Change

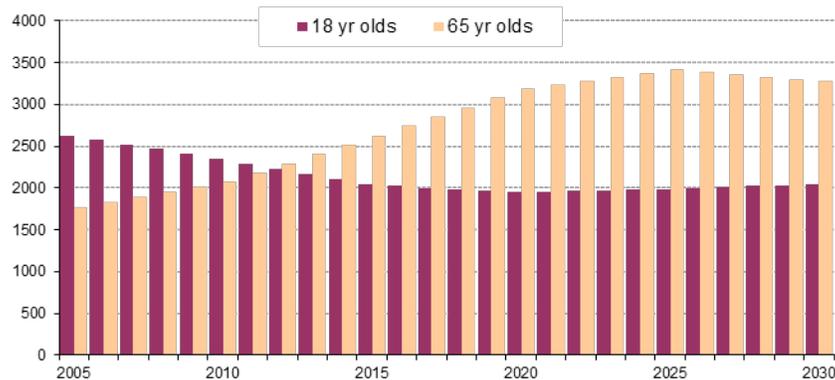
It's been well documented that the pace of technological change is accelerating. In his 1981 book, *Critical Path*, inventor and futurist R. Buckminster Fuller introduced the "knowledge doubling curve". He documented that around 1900 knowledge doubled every 100 years. Fuller estimated that by the end of World War II knowledge was doubling every 25 years, and if plotted on a timeline the resulting curve was exponential, or J-shaped. Today, knowledge is doubling in less than two years and, according to IBM, with the advent of "the internet of things", knowledge will soon double every 12 hours (Schilling, D. R., 2013). As a simple example, consider the choices available today for medical imaging. When I was in my teen years I had a potential bone break that was analyzed using x-ray technology. There weren't too many other ways to obtain an image of a bone or internal organ in those days. Today a much broader array of sophisticated imaging technologies is available including Positron Emission Tomography (PET) scanning, Magnetic Resonance Imaging (MRI), and ultrasound imaging, to name a few! These wonderful imaging technologies have enhanced our lives and also expanded the array of career choices available to our students. The pace of technological change not only presents wonderful quality of life implications and exciting employment pathway options, but also challenges our ability to prepare students for an expanding spectrum of career options. How we meet these challenges has significant implications for CTE.



Knowledge Doubling Curve – Another Perspective

### Demographic Shifts

The “skills gap”, or talent gap, will be exasperated by demographic trends. The post-World War II recovery brought with it a population boom that spanned from 1945 to the late 1960s (Business Dictionary, 2017). Those born during this period became known as the “Baby Boomers” and, according to the United States Census Bureau, the first Baby Boomers turned 65 in 2011. The United States Census Bureau also indicates that by 2030 all of the Baby Boomers will be at least 65 years of age (Colby, S. L., Ortman, J. M., May, 2014). During this 19-year period, Pew Research Center indicates that 10,000 Baby Boomers will turn 65 each day (Pew Research, December 29, 2010). In other words, every 9 seconds a Baby Boomer will reach retirement age. The out migration of the Baby Boomers from the workforce will not be offset by an inflow of younger workers as that demographic group is not growing as fast as the Baby Boomers are aging. This dynamic is illustrated by the trend lines for Wisconsinites of 18 and 65 years of age:



Source: WI Dept. of Administration, Demographic Services

The nationwide result will be that nearly 3.5 million STEM and middle-skill positions in manufacturing will need to be filled, but only 1.5 million people will have the skills necessary to do so. This talent gap is verified in a recent survey of U.S. employers indicating that 92% of them believe there is a serious gap in workforce skills (Fyfe-Mills, K., October 8, 2015). The time required to fill these vacant positions recently hit an all-time high of 26.4 days in the United States and 40 days for middle skill jobs (Keylor, B., July 14, 2016).

## **Growth of the Global Economy**

We live and compete in a robust global economy. The food and products we consume, literally, are from around the world and the workplace our graduates enter is also truly global in nature. The International Monetary Fund (Landon, T., April 18, 2017) forecasts growth of the international economy to be 3.5% in 2017, up from 3.1% in 2016. This growth rate validates the improving health of the global economy but portends challenges to the global workforce. Manpower Group found that 40% of global employers reported talent shortages in 2016. This is an upward trend from 38% the previous year and 30% in 2009 (Manpower Group, 2017). A recent survey of 1,322 international CEOs in 77 countries indicated that 75% of them felt the skills shortage was the biggest threat to their business (Fyfe-Mills, K., October 8, 2015).

## **What Does This All Mean?**

With the pace of technological change accelerating, the growth of the global economy presenting its own opportunities and challenges, and with a massive demographic shift under way, the need to better prepare students for careers is rising sharply. For educators in systems at all levels, the challenge of keeping pace with change in an environment that is not resource rich is daunting! But there are several tried and true strategies that can help us navigate the choppy waters ahead. In addition, these trends confirm the future need for CTE programming and our state and federal leaders are starting to support that need. As Rob Portman, Senate Co-Chair of the House and Senate CTE Caucus, stated on the floor in February 2017:

If we continue to focus on Career and Technical Education... we're going to help many, many millions of our young people to be able to have better opportunities. And as importantly, we're going to be able to help our economy. We're going to be able to help create more jobs, more opportunities here in this country to be able to close that skills gap, to put people to work. It just makes too much sense for us not to come together as Republicans and Democrats alike and with the new administration to promote Career and Technical Education.

At the state level, Governor Scott Walker has indicated that addressing the skills gap is a priority issue for Wisconsin stating, "business owners around the state repeatedly tell me the skills gap is a critical problem facing the state and their ability to fill jobs". Over his tenure the Governor has devoted significant resources, such as Fast Forward grants, funding for FabLabs, as well as other investments to help address the skills gap and revitalize CTE. These actions are important and send the right message, but a lot more needs to be done.

## **Effective CTE models of engagement**

CTE models of learning have a great reputation for engaging students, which is extremely important. I recall Joe Klein's *Time Magazine* article (May 2012) in which he asserted that "High school dropout rates continue to be a national embarrassment. And most high school graduates are not prepared for the world of work". DoSomething.org reports that every year over 1.2 million students drop out of high school in the United States. That's a student every 26 seconds or 7,000 a day. The U.S., which had some of the highest graduation rates of any developed country, now ranks 22<sup>nd</sup> out of 27 developed countries. A common theme found in research studies that examine why

students drop out of school is that there is a lack of student engagement. If we want to conquer the talent gap, then we need to engage students while they are in school so that they persist to graduation. CTE models offer the promise of sustaining that engagement. With so many innovative models of CTE engagement currently in play (FabLabs, enterprise models, Project Lead the Way programs, etc.), some of the important roles UW-Stout can play is to assess the effectiveness of each of these models, identify factors that contribute to success, recognize best practices, and share these findings with the educational community and with aspiring CTE teachers. We can also (and are beginning to) share curricula related to the best models of engagement that lead to student success.

### **Employer involvement**

In May of this year, I had the privilege of visiting three German universities with one of our largest Wisconsin employers. What I saw was nothing less than amazing. The German government and private industry was heavily invested in education from the K-12 levels through post-secondary levels. Parents and students were encouraged to focus on career pathway choices at ages much earlier than we do in the United States. The big take away for me was that employers, educators, government, and parents were working together closely to prepare students for their future careers. The bottom line was that there is a commitment to work together to the benefit of the students, and thereby the benefit of employers and German society! It is encouraging to me to see more employers engage with us in a way to create partnerships that are strategic.

My travels to Germany reminded me that, while I was President of Wisconsin Indianhead Technical College, the Wisconsin Technical College System convened a *Future First Summit* (2011). The summit brought educators, community leaders, and industry leaders together to plot a course for CTE education. Several key strategies were identified at this summit, perhaps one of the most important was the need for employers to assume a more active role and support education with resources and information, concluding that:

- Business will need to take the lead on creating the dialogue among industry, education, and government to incentivize CTE training.
- Information on what skills are necessary and the value of the career pathways in each industry sector must be publicized by the business community.
- Industry must embrace education if it is to keep pace with innovations in technology.
- Business must help reach out to parents, both about the value of jobs in their industry sector and the pathways to these jobs played by career and technical education.
- The more business can help to change and shape the recognition of their workplace, the easier it will be to shift the perception of career and technical education.

As Jim Morgan, the past President of Wisconsin Manufacturers and Commerce (WMC), put it:

Wisconsin manufacturers admit their involvement in education has been spotty at best and non-existent at worst. Too many manufacturers are not engaged, especially at the K-12 level. We're not telling the manufacturing story. We need to take responsibility for the image. People need to see what we do (May, 2012).

Monster.com (2017) validates Jim Morgan’s messages by encouraging employers to get involved with their local school systems, stating the need to encourage company thought leaders to be guest speakers or teachers, or join a local school board to influence the school’s curriculum and talent pipeline. I’m pleased to report that members of WMC have responded very positively to Jim Morgan’s challenge and are becoming very involved with the education community.

### **We need to work together**

Several national organizations (Advance CTE, Association for Career and Technical Education, Council of Chief State School Officers, National Association of State Boards of Education, National Council of State Directors of Community Colleges, National Skills Coalition, and U.S. Chamber of Commerce Foundation) have articulated a bold vision for all of education, including CTE, that offers a number of recommendations in a document titled *Putting Learner Success First: A Shared Vision for the Future of CTE*. One very relevant suggestion was that “all systems work together to put learner success first”.

As stated in the *ATD Public Policy Council Updates Skills Gap Whitepaper*: “Bridging the skills gap cannot be done by any one entity. It requires a holistic approach and recognition that preparing people to go to work with relevant skills and knowledge for jobs that exist now, and in the future, means that everyone has a role to play. From education to employers to government and the public workforce system, new thinking and collaboration are necessary (Fyfe-Mills, K., October 8, 2015).” This means that we all need to work together more intentionally. Educators and business owners need to work together to advocate for CTE as well as inform students and parents of the career pathway choices that are both exciting and rewarding. Our education systems need to work more closely together to create pathways that respond to student needs, giving them on ramps and off ramps as they pursue these pathways. This flexibility means that we need to make our systems and programming more connected and seamless. Where appropriate we should encourage, rather than discourage, credit transfer.

One report that framed up an excellent future vision for CTE was *Reclaiming the American Dream, Community Colleges and the Nation’s Future* (2012, American Association of Community Colleges). While the report was focused on CTE education at the community college level, I thought the findings were enlightening for all levels of CTE and I offer them in closing for your consideration:

## CHALLENGE: MAKING CTE MORE RESPONSIVE

### Framework of Institutional Responses Needed to Move Community Colleges Ahead

| Move From  | Move To  |
|--|--|
| A focus on student access                        | A focus on access and student success                                      |
| Fragmented course-taking                         | Clear, coherent educational pathways                                       |
| Low rates of student success                     | High rates of student success  |
| Tolerance of achievement gaps                    | Commitment to eradicating achievement gaps                                 |
| A culture of anecdote                            | A culture of evidence  |
| Individual faculty prerogative                   | Collective responsibility for student success                              |
| A culture of isolation                           | A culture of collaboration   |
| Emphasis on boutique programs                    | Effective education at scale   |
| A focus on teaching                              | A focus on learning  |
| Information infrastructure as management support | Information infrastructure as learning analytics                           |
| Funding tied to enrollment                       | Funding tied to enrollment, institutional performance, and student success |

*Reclaiming the American Dream, Community Colleges and the Nation's Future, American Association of Community Colleges, 2012*

### References

- 11 facts about high school dropout rates. (n.d.). Retrieved from <https://www.dosomething.org/us/facts/11-facts-about-high-school-dropout-rates>
- American Association of Community Colleges. (2012, April). *Reclaiming the American dream: A report from the 21<sup>st</sup> century commission on the future of community colleges*. Retrieved from <http://www.aacc.nche.edu/21stCenturyReport>
- Manpower. (n.d.). 2016-2017 Talent shortage survey. Retrieved from <http://manpowergroup.com/talent-shortage-2016>
- Business Dictionary. (n.d.). *What are baby boomers?* Retrieved from <http://businessdictionary.com/definition/baby-boomers.html>
- Colby, S. & Ortman, J. (2014, May). *The baby boom cohort in the United States: 2012 to 2060*. Retrieved from <http://www.census.gov>
- Fyfe-Mills, K. (2015, October 8). *ATD Public Policy Council Updates Skills Gap Whitepaper; Bridging the skills gap: Workforce development is everyone's business*. Retrieved from <https://www.td.org/Publications/Blogs/ATD-Blog/2015/>
- Fuller, R.B. (1981). *Critical path*. New York, NY: St. Martins Press.
- Future First Summit. (2011). *Wisconsin Technical College System: Meeting the challenges of the future*. A report on the WTCS Future First Summit.
- Heimlich, R. (2010, December 29). *Baby boomers retire*. Retrieved from <http://www.pewresearch.org/fact-tank/2010/12/29/baby-boomers-retire/>
- Keylor, B. (2016, July 14). *6 skills gap statistics that continue to impact hiring*. Retrieved from <http://www.daviscos.com>
- Klein, J. (2012, May 14). Learning that works. *Time*. Retrieved from <http://content.time.com/time/magazine/article/0,9171,2113794-2,00.html>
- Morgan, J. (2012). *Workforce paradox*. Wisconsin Technical College Presentation

- Portman, R. (n.d.). *In floor speech, says CTE will help close the skills gap in Ohio, create more jobs*. Retrieved from <https://www.portman.senate.gov>
- Putting Learning Success First: A Shared Vision for the Future of CTE. (2015). *The Future of CTE Summit*. Retrieved from [www.careertech.org/vision](http://www.careertech.org/vision)
- Recruiter Training Corner. (n.d.). Talent acquisition crisis: bridging the talent gap. Retrieved from <https://hiring.monster.com/hr>
- Schilling, D. (2013, April 19). *Knowledge doubling every 12 months, soon to be every 12 hours*. Retrieved from <http://www.industrytap.com>
- Thomas, L., Jr. (2017, April 18). *IMF raises 2017 outlook for global economic growth*. Retrieved from <https://www.nytimes.com>

# The Future of Career & Technical Education in Wisconsin

Dr. Morna K. Foy, President  
Wisconsin Technical College System

The future of Career & Technical Education (CTE) in Wisconsin, at both the secondary and postsecondary level, is being driven by changes in expectations.

It is being driven by changes in customer expectations. For secondary and traditional postsecondary students, we can also include the changing role and expectations of parents and other influencers. For CTE educators, customers also include local and statewide employers.

The future of CTE will also be shaped by funders, whether they be policymakers or philanthropic organizations. While these stakeholders will have a say, perhaps even increasingly so, the future of CTE will ultimately be dictated by how our systems and institutions respond to the disruption of these expectations, paired with rapidly changing technology and our own workforce realities.

## Changing Expectations of Customers

Increasingly, students view themselves as *customers*. Historically, academics may have recoiled at use of the word “customer” in relation to students. Yet as consideration of student preparedness, diversity, learning styles, borrowing and indebtedness has evolved in the past decade, we must keep pace. Specifically, as students have increasingly come to view themselves as customers, purchasing a good or service, their expectations have changed in four key areas:

**Flexibility** – Students expect curriculum that is adaptable to their individual learning styles and preferences, while also accounting for the expectations of the employers who hire our graduates, regardless of sector.

**Accessibility** – With near-universal adoption of and reliance on technology, students increasingly demand that learning be available anywhere, anytime and in a variety of formats (flexibility). If we don’t meet this demand, someone will.

**Portability** – “Swirling” – the idea that postsecondary students may attend more than one institution on the way to graduation – now seems almost quaint. Many more students are starting college in high school and may enter and leave countless times over the course of a career or lifetime. They expect credits that transfer and credentials that stack.

**Affordability** – The elasticity of demand has changed. We can no longer name our price and count on tuition and public funding to increase predictably. We *can* count on tough questions about value for investment.

For CTE programs, employers are also an important customer. Successful employers are engaged in education or training their talent pipeline. Similar to students, employers have greater expectations of flexibility, accessibility, portability and affordability in the talent pipeline programs they help develop and deliver.

## **Changing Expectations of Policymakers, Philanthropic Organizations**

Over the same time that students' and employers' expectations have changed, the role and expectations of *other* funders – in addition to those who pay tuition – have also evolved. These funders – including policymakers and philanthropic organizations – have sharpened their focus on, and increasingly linked funding to:

**Outcomes** – Funders speak about performance, proof and Return on Investment (ROI) with respect to education in a way that's markedly changed, if not new.

**Demonstrated Efficiencies** – They also increasingly expect institutions to drive efficiencies, such as increased instructor course loads, that at times can be seen to be in conflict with improved student access or outcomes. The very outcomes, such as development of a skilled workforce, that interest policymakers in particular.

## **Response of Institutions**

So, how will secondary and postsecondary CTE educators and leaders respond? We must embrace change, continuing to drive change that is focused on student outcomes, including:

- a stronger curriculum framework, one that facilitates traveling a “pathway;”
- actualizing the promise of a lifelong learning continuum;
- encouraging faculty innovation;
- keeping pace with students' and employers' adoption of technology, and the rapid pace of change in knowledge and in the workplace;
- dissuading ourselves of the notion that a person can be *the* expert in “X,” which is less and less likely as each individual is asked to do a wider range of work; and
- integrating curriculum and programs in a way that reflects real-world, team-based scenarios and problem-solving.

Education is on a continuum of learning. More than ever, we're in the business of helping people “learn how to learn” ... for a career and a lifetime. The “terminal degree” is a thing of the past. In a time of unprecedented disruption, we must embrace change and stay the course with innovative, customer-focused solutions.

# What is the Future Vision of CTE for Wisconsin?

Jim Morgan, Vice President  
MRA – The Management Association

What do we want it to be? If there is one thing I have learned in my 30+ years of “professional life,” deciding what you want to have happen has a great deal of impact on what actually does happen!

## **First of All, CTE is Not Alone**

As a backdrop, it is important to note that the CTE shortage is not an isolated event. Business, education and government leaders have been looking at the talent pipeline for the past 30 years. Unfortunately, until recently, that work was usually temporary, and the level of activity was tied directly to the unemployment rate: high unemployment rate = no trouble finding talent, low unemployment rate = no talent available.

Big picture, right now in the United States, 10,000 people are turning 65 every day. The Baby Boomers have finished their work life and are now moving toward retirement. This is a big deal because the numbers really do matter. What was the largest generation ever, the baby boomers, is moving out. Generation X, representing millions fewer people, is filling in. And the Millennials, the new “largest generation ever” are beginning their takeover of the workplace, but don’t own it . . . yet!

Another factor is the homogeneous nature of the Upper Midwest. States in this area have an 80-85% Caucasian population and this population has a lower fertility rate. In addition, the lack of diversity has hurt the region because it makes the recruitment of minorities a bigger challenge.

If you look at migration patterns across the states, the Upper Midwest (and the Northeast) is not faring well in terms of attracting additional talent. Notably, the Upper Midwest is getting old, fast. Wisconsin, for example, will double the number of residents over the age of 65 in the next two decades. The state will go from 750,000 people in the 65+ category to 1.5 million. Think about the ramifications of that phenomenon! So, low birth rates, out-migration, difficulty recruiting minorities, aging population . . . you get the picture.

## **CTE Has an Advantage, You Have the Students**

Other than parents and family, faculty and school staff may have as much impact as anyone on the career decisions of students. They are influencers. Assume I am a student asking the following questions, what are your answers?

- I am thinking about going into teaching, what do you think?
- I am very good at math, science and engineering, what career should I pursue?
- Do you like having summers off? (Don’t get angry at me, I know the real answer!)
- What are the best and worst parts of being a teacher?

I work for an employer-association that specializes in human resources issues. The battle for talent has changed . . . dramatically. Identifying, recruiting, selecting, onboarding and sustaining quality individuals is full-time work for every organization. What are you doing differently as it relates to career and technical education's talent supply chain? Are you answering the questions above as a PERsuader or a DISsuader? There are many things you can do as a persuader, as noted below:

- View yourself as a recruiter
- Think about the generational expectations of candidates
- View your co-workers as recruiters
- Sell teaching
- Get in the middle schools to educate students on education careers
- Give high schools students internships in middle schools
- Get to the parents
- Establish the school's employer "brand"

So, what do we WANT the future of Career and Technical Education to be in Wisconsin?

# Recommendations

Following the second panel, participants moved into breakout groups and were asked to reflect on the following questions:

1. What did you hear that has shifted your thinking about career and technical/workforce education and career preparation that impacts your vision?
2. To what extent can secondary and post-secondary CTE programs effectively prepare students for immediate employment in shortage areas while at the same time providing them with the intellectual tools and transferable skills needed to respond to inevitable changes in the workplace?

The following recommendations reflect participants' reactions to panelists' remarks.

***To respond to the changing workplace and immediate employment in shortage areas career and technical education must provide students educational opportunities that will result in intellectual tools and transferable skills in order to develop lifelong learners.***

CTE has traditionally taught content and skills for specific occupations, preparing young people for employment; however, the rapid pace of change fueled by advances in technology and global competition have necessitated taking a broader view. Change and the ability to adapt to change has become as important as occupational specific knowledge and skills. To prepare young people for current occupations as well as the inevitable changes in those occupations, career and technical education must place more emphasis on teaching for transfer, problem-based learning, experiential learning, and learning to learn.

## **Teaching for Transfer**

***More emphasis needs to be placed on enduring concepts and essential skills that underpin one's chosen occupation.***

Career and technical education needs to prepare students for the workplace as it currently exists and prepare them for the likelihood it will change in significant ways. Thus, there is a need to emphasize enduring concepts, skills, and dispositions that are fundamental to their field of study. The goal needs to go beyond teaching an occupation to teaching for transfer within and beyond one's chosen field of study. This will call for identifying and stressing broad ideas that can be leveraged to learn anticipated as well as unanticipated concepts and skills that will emerge in the future. These ideas must be taught with mastery in mind. Students need to experience and apply profound understanding in multiple and authentic contexts. They will need to demonstrate their ability to present knowledge in multiple ways, make connections between different kinds of knowledge, reflect on the nature of knowledge, and apply it to diverse situations.

## **Problem-Based Learning**

***The transferable skills needed for high wage, non-routine occupations can be developed by engaging students in problem-based learning.***

Quality career and technical education brings situations from the workplace into the learning environment. This facilitates learning by presenting students challenging problems that call for using knowledge in authentic contexts. With instructor support, students have to demonstrate higher order thinking skills while researching and synthesizing information in collaboration with peers. Together they must present their thought processes, defend their conclusions and make recommendations. This rigorous approach to developing understanding and transferable skills ultimately will result in confident learners who are ready to meet the challenges that non-routine occupations will present. Problem-based learning enables students to become empowered adults who can solve current and emerging problems in the workplace. More importantly, problem-based learning develops habits of mind that support life-long learning.

## **Facilitate Experiential Learning**

***Experiential learning provides students an opportunity for engagement within real-world work environments.***

Experience is the best teacher; therefore, career and technical education strives to immerse students within the workplace. The workplace becomes the ultimate laboratory where students can apply the knowledge and skill taught in the classroom. Rich settings that are holistic and multidimensional will enhance student learning by providing the opportunity to uncover career opportunities and experience the culture of the occupation and workplace. When brought back to the classroom, firsthand experiences can be shared, examined, and applied to future learning experiences. Within these applied settings, students have the opportunity to develop knowledge and skills that can be applied as they proceed through further educational experiences and within their various life careers. To develop the structure and the focus for such experiences, collaborative partnerships will need to be formed between educational entities and business/industry. Business and industry play a key role in the development of successful authentic learning experiences with the potential for the greatest impact when programs move beyond curriculum-focused experiences for students to those where individualized mentoring and coaching occurs.

## **Grooming Life Long Learners**

***Given the exponential growth in knowledge and to foster lifelong learners, instruction must allow individuals to challenge assumptions, struggle with diverse perspectives, and develop confidence.***

Business and industry value people who take the initiative to identify gaps in their understanding and seek new knowledge and apply it to their work. Individuals must

continuously pursue and embrace opportunities to learn. Lifelong learners embrace these opportunities by reflecting on what they know, recognizing gaps in their understanding, utilizing resources, synthesizing new knowledge with prior knowledge, applying the new understanding to new situations, and evaluating results. To help individuals become lifelong learners, career and technical education must teach students to be their own best teacher. This process will include modeling what it means to be a lifelong learner, helping students recognize the ambiguity and frustration associated with learning, and leverage passion to persevere through challenges, and reflect on accomplishments. This provides individuals the learning tools and strategies they need to address new challenges with the self-confidence to adapt to change.

# Panel 3: Vision for CTE Teaching and Learning in Wisconsin

The final set of panelists for the 2017 CTE Summit were CTE practitioners at the secondary or postsecondary level who shared forward-thinking initiatives they have led. The invited panelists were:

Russ Tronson, Principal, Badger High School (Lake Geneva, WI)  
Dr. Christopher Neff, CTE Coordinator, Racine Unified School District  
Dr. Josh Gamer, Interim Vice President of Learning, Western Technical College  
Dr. Lori Suddick, Vice President for Learning, Northeast Wisconsin Technical College (now President of the College of Lake County, IL)

Each of the panelists was asked to respond to the question: What are the best practices in moving CTE forward? The panelists' thought papers, written in their own words in response to this question, are presented in the following pages.

# What are the best practices in moving CTE forward?

Russ Tronsen, Principal  
Badger High School

In my tenure as a Family and Consumer Science teacher, responsible for developing a vocational program in Culinary Arts, I learned a lot about building a quality CTE program. My first step in moving my program forward was to adopt a curriculum from which I could design the content and programming for the course. The program that I used was the ProStart “Becoming a Foodservice Professional”. This curriculum was developed and written in partnership with the National Restaurant Association Education Foundation (NRAEF). When selecting a curriculum, I recommend a curriculum that is vetted by Industry Professionals along with Post-Secondary Professionals. To me that is a huge sell when building partnerships, which was part of the next phase of my program building.

The second phase in building my CTE program was developing School Based Enterprises (SBE). As a necessity, I needed to do perpetual fundraising for my program as the budget was very minimal and couldn’t support the types of activities I wanted to do in the classroom. The one good part was that I had access to an industrial kitchen. Through the use of the kitchen, we did catered events for just about any activity type. Through this SBE I was able to form supplier partners with several different foodservice brokers. It was also how I became acquainted with the local chapter of the American Culinary Federation (ACF). A student of mine had a father that was a Chef in the local area. We were introduced and formed a great relationship. Through him I became a formal member of the ACF and began to expand on building industry connections.

The next few years were about establishing a continuum of support to maintain running a quality CTE program. A major contributing factor was forming an Advisory Team. I assembled a team of educators, parents, students, postsecondary, administration and industry professionals. I held annual meetings at the school where we could overview the program and highlight the key points of success and identify areas for improvement. Through those meetings, Industry professionals were able to discuss their concerns. This, it helped to show administration what was needed to further enhance the program. This also helped me acquire new curriculum materials in the form of newer editions to ProStart the “Foundations” series of textbooks. Additionally, through these meetings we were able to establish workplace relationships for students to be able to complete their workplace experience checklists. The Advisory Team was paramount for the program as it really cemented the value of what we were accomplishing with students.

Through the Advisory Team we also formed relationships with Industry partners that helped support our program through in-kind and financial donations. When we were able to access those resources, it helped open up more opportunity for students to work with products that would not ordinarily fit in a school budget. We also received support through supplying food products for our students to use through practice for student competitions in FCCLA and ProStart. It was at this time we saw our first major success in the form of winning a state invitational in 2006. Through that win we were also sponsored by our Industry partners for the National Competition. As the years moved on

we continued down this successful pathway eventually earning our first National title in 2008.

Another area for opportunity is through professional development. The NRAEF offers teacher trainings throughout the summer around the country. I experienced my first one through a scholarship that I received to attend at no cost. I completed a total of four one-week trainings over several years; each with a certification exam at the end of the week. Through these opportunities I was able to gain great resources that related specifically to the ProStart curriculum and bring back to the classroom. I eventually earned my Certified Secondary Foodservice Educator (CSFE) certification by completing the program and earning worksite experience in the foodservice industry. I also over the years participated in a variety of similar one-time experiences through various colleges and universities that have culinary and hospitality programs. My involvement in the ACF local chapter afforded me opportunities to work in some of the area's best kitchens during summer to further hone my craft and bring back things to the classroom. For me Professional Development was highly important as I wanted to be on the cutting edge of what was happening in the Industry. All of these items presented were an integral part of my instructional success and building and maintaining my program.

### **Resources**

ProStart: [www.nraef.org](http://www.nraef.org)

ACF: [www.acfchefs.org](http://www.acfchefs.org)

Twitter @PrincipalTrons

Badger ProStart Facebook: <http://fb.me/BadgerProStart>

# **The Academies of Racine and Barriers to Partnerships**

Christopher R. Neff, Director of Career and Technical Education  
Racine Unified School District

Career academies are a high school education model providing cross-disciplinary career and technical education with academics, career development, and work-based learning programming incorporating contextualized experiences (Courtnage, Poulson, & Severson, 2012). Career academies may be designed and implemented as wall-to-wall, in which every student chooses an academy, or pocket, where students elect or apply to be a member of the academy (Kemple, 2001). Three elements are integral to the career academy model of education: students assigned to small learning communities as cohorts; themed courses aligned with core academic coursework leading to college and career readiness; and the involvement of employers, post-secondary education and training, and community members in the advisement of educational outcomes and involvement with work-based learning and contextualized experiences (Advance CTE, 2013; Kemple, 2008; National Career Academy Coalition, 2016). The involvement of employers is critical to the success of career academy implementation, providing rigorous and relevant curriculum objectives and experiences leading to career development, industry credentials, and college readiness.

The Racine Unified School District (RUSD) is the fifth largest school district in Wisconsin, located on the shores of Lake Michigan south of Milwaukee. Seven communities are served by RUSD: City of Racine, Villages of Caledonia, Elmwood Park, Mount Pleasant, North Bay, Sturtevant, and Wind Point. Approximately 20,000 PK-12 students are served by RUSD's 37 schools, including the three major high schools: J.I. Case, Washington Park, and William Horlick (RUSD, n.d.b). District-wide, 62 percent of students qualify for free and reduced lunch, with high schools ranging from 51 to 65 percent (RUSD, 2015). The North Star Vision guides the work of RUSD: All students will graduate college and/or career ready, supporting the Mission: Educate every child to succeed (RUSD, n.d.a).

In the fall of 2014, the RUSD community began discussing transforming the three major comprehensive high schools: Case, Horlick, and Park; to wall-to-wall career academies to increase student achievement, engagement, college and career readiness. These discussions resulted in study visits to Metro Nashville Public Schools' Academies of Nashville and Racine community organization partnerships with Higher Expectations for Racine County, Racine Area Manufacturers and Commerce (RAMAC), United Way of Racine County, Gateway Technical College and the University of Wisconsin-Parkside. In the summer of 2015, Ford Next Generation Learning (FNGL) worked with RUSD to develop a strategic plan to implement career academies, and in the fall of 2015, the Academies of Racine were born.

Regional labor market data and trends provided the launching point for the initial Career Pathways and Academies offered to RUSD high school students. Higher Expectations for Racine County worked with the Wisconsin Department of Workforce Development in identifying the high demand employment sectors. The Academies of Racine is providing every high school student a wall-to-wall career academy opportunity at Case, Horlick and Park leading to high impact work-based learning, in demand

industry certifications/credentials, and dual credit opportunities with regional post-secondary educational institutions.

Partnerships between education and employers are vital to the success of the Academies of Racine including relevant and rigorous CTE programming and work-based learning experiences as well as leading to meeting local employment needs (Bond & Navarra, 2012; Courtnage, et al., 2012; Stone III & Lewis, 2012). The “Opportunities to Engage” interactive theory explained manufacturing employer’s choice and interest in providing experiences for students and families to learn about the field, however struggle to execute due to identified barriers (Neff, 2017). These barriers prevented employers in high demand employment areas, such as health care and manufacturing in Racine County, to providing internship experiences to high school and college students (Hodek, Miezio, Sachse, & Winters, 2016). If the Academies of Racine are to accomplish their goal of providing contextual learning experiences for all academy students with an employer, barriers must be identified and strategized on how to overcome.

### **Recommendations**

Work-based learning experiences have been designed and developed for Academies of Racine students to participate. Employers in the community are presented the experiences and methods in which RUSD needs classroom and program connections. The challenges identified by manufacturing employers in RUSD boundaries, which make up 27 percent of employment, to engaging with the academies included resources, time, liability and insurance concerns (Hodek, et al., 2016; Neff, 2017). Identifying additional barriers within manufacturing and across other employment sectors aligned with the Academies of Racine will assist in the development of strategies to overcome such challenges. Barriers sharing a common theme should result in collective impact across employment sectors, such as insurance, to utilize resources effectively in overcoming the issue. As barriers are conquered, the information needs to be disseminated across the community and FNGL network for others to implement similar strategies resulting in higher student engagement with community employer partners.

### **References**

- Advance CTE. (2013). *Career academies: Investing in students, the workforce and career and technical education*. Retrieved from <https://careertech.org/sites/default/files/CareerAcademies-InvestinStudents-May2013.pdf>
- Bond, D., & Navarra, A. (2012). Teaching and learning. In Center for Occupational Research and Development & National Association of State Directors of Career Technical Education Consortium (Eds.), *The career pathways effect: Linking education and economic prosperity* (pp. 221-256). Waco, TX: CORD Communications.
- Courtnage, L., Poulson, R., & Severson, A. (2012). Course sequence and delivery systems. In Center for Occupational Research and Development & National Association of State Directors of Career Technical Education Consortium (Eds.), *The career pathways effect: Linking education and economic prosperity* (pp. 197-220). Waco, TX: CORD Communications.
- Hodek, S., Miezio, W., Sachse, J., & Winters, D. (2016). *2016 Racine County labor*

- market analysis*. Madison, WI. Retrieved from [http://higherexpectationsracinecounty.org/uploads/ckeditor/attachments/86/2016\\_Racine\\_Labor\\_Force\\_\\_Study.pdf](http://higherexpectationsracinecounty.org/uploads/ckeditor/attachments/86/2016_Racine_Labor_Force__Study.pdf)
- Kemple, J. J. (2001). *Career academies: Impacts on students' initial transitions to post-secondary education and employment*. Retrieved from [http://www.mdrc.org/sites/default/files/full\\_47.pdf](http://www.mdrc.org/sites/default/files/full_47.pdf)
- Kemple, J. J. (2008). *Career academies: Long-term impacts on labor market outcomes, educational attainment, and transitions to adulthood*. Retrieved from <http://www.mdrc.org/publication/career-academies-long-term-impacts-work-education-and-transitions-adulthood>
- National Career Academy Coalition (NCAC). (2016). *National Career Academy Coalition*. Retrieved from <http://www.ncacinc.com/>
- Neff, C.R. (2017). *Manufacturing employer engagement with high impact work-based learning programs of career academy high schools: A qualitative grounded theory study*. Manuscript submitted for publication, University of Wisconsin-Stout, Menomonie, WI.
- Racine Unified School District. (n.d.a). *North star vision*. Retrieved from <http://www.rusd.org/district/north-star-vision>
- Racine Unified School District. (n.d.b). *Our schools*. Retrieved from <http://www.rusd.org/district/our-schools>.
- Racine Unified School District. (2015). *Racine Unified School District Ford Next Generation Learning master plan*. Retrieved from <http://files.ctctcdn.com/87d6fed8001/12cda960-7593-4b23-8eb5-5d51597340e9.pdf?ver=1460726301000>
- Stone III, J. R., & Lewis, M. V. (2012). *College and career ready in the 21st century: Making high school matter*. New York: Teachers College Press.

# **How Utilizing a Living Lab Concept Can Transform Place-based Education, Engage Students Within the College, and Provide Necessary Budget Relief**

Joshua J. Gamer, Interim Vice President of Academics  
Western Technical College

## **Problem Statement**

Providing relevant, engaging, and meaningful learning opportunities is at the core of education. The first hint of how place-based or community-based education can help achieve this was brought forth by Dewey in 1915. Dewey described how engaging learners outside of the classroom and within the community was a positive strategy (as cited by Evans & Kilinc, 2013, p. 266). These meaningful and contextualized learning opportunities further help to engage students and solidify citizenship (Evans & Kilinc, 2013) and are adaptable to various curriculum offerings. Participating students also gain knowledge which is connected to real-world conditions and facilitated through specific linkages to desired academic outcomes (Pipatpen, 2015). Unfortunately, implementing community-based education models is reliant on continued support from leadership within industry and academics and can come with a cost not easily sustainable for all schools (A. Howley, M. Howley, Camper, & Perko, 2011). With school funding not necessarily connected to enrollment and costs rising (Teece, 2016) rethinking how we approach placed or community-based education seems critical if we are to expand it.

## **Living Labs as Solution**

One such strategy for improving a college's ability to offer otherwise costly learning opportunities may arise from looking within. Every institution of higher education has a business within a business; encompassing all functional areas as well as infrastructure necessary to run the institution. Although the academic literature surrounding living labs is limited, an exploration of various publications reveals several similarities in definition and deployment which can be highlighted. On a broad scale, the creation of a living lab is an attempt to merge academics and campus facilities (Cohen & Lovell, 2013). Using existing and future facilities not as just a place to study at but as an environment to study. A living lab then is a place where students and community members participate in the environment rather than act as a silent observer (Hawk, Bartle, & Romine, 2012). Often, the living lab concept is attached to sustainability efforts as a way to promote sustainability. It can however be framed in a plethora of ways dependent on the desired learning outcomes.

Living labs allow the user to construct new knowledge through the study of how the environment functions. The environment should not serve simply as an exhibition or a job shadow opportunity, rather it should serve to strengthen existing knowledge and build new. By this definition, it is an "open innovation environment, operating in reallife (sic) settings, where the active engagement of end-users allows the creation of paths of co-creation of new services, products, and social infrastructures (Corallo, Latino, & Neglia, 2013, pg. 1)". In relation specifically to academics, the living lab is a research methodology meant to involve the user in the creation of something new (knowledge and

understanding perhaps) within a real-life setting (Dell’Era & Landoni, 2014). The living lab concept can be viewed as the vehicle by which the learning can take place. In essence, it transforms the concept of community-based education from an external function to an internal one. Students partake in real functions and systems of the institution; marketing, HVACR, IT, energy, etc.

From the budget perspective, the living lab concept can provide much needed relief. When using the facility itself as a learning tool, redundancy of equipment is reduced. Construction curriculum for example is taught directly with existing or new construction plans for the institution, as well as through the examination of the existing building’s performance. What was once thought of as a piece of capital equipment or trainer becomes a shared resource for all students and academic areas with interest. From a teaching perspective, students are actively engaged with real-world equipment, applications, opportunities, and the institution.

From a facilities perspective, this would entail seeking input from students and faculty about the potential uses of facilities beyond the traditional uses. Dell’Era & Landoni, (2014) would advocate that when applying the living laboratory methodology to campus facilities, we must “facilitate a co-creation processes based on contextual factors and enrich their stakeholder interaction capabilities and interpretative capabilities to assess local settings (p. 3.)”.

While living labs can provide unique experiential learning opportunities, instructional leaders should make efforts to ensure that the philosophy is not abused. Simply utilizing students to perform tasks or undertake research efforts, without first identifying the learning objectives, should be avoided. Additionally, communicating the institution’s vision of what a living lab is meant to be will help provide a consistent framework for all to build upon.

## **Conclusions**

The value of providing relevant, engaging, and meaningful learning opportunities within academics is undebatable. By adopting the living lab model where appropriate, faculty can further provide cost effective and often collaborative education within the control of the institution. By viewing our physical places of work as places full of learning opportunities, we embrace the construction of new knowledge through the context of the students’ interactions within our institution. To accomplish this however, it is imperative that the institution carefully define their living lab philosophy and definition and consistently apply it throughout campus and across communications.

## **References**

- Cohen, T., & Lovell, B. (2010). The Campus as a Living Laboratory. *SEED Center*, Retrieved from <http://www.theseedcenter.org/Resources/SEED-Toolkits/Campus-as-a-Living-Lab>
- Corallo, A., Latino, M., & Neglia, G. (2013). Methodology for User-Centered Innovation in Industrial Living Lab. *ISRN Industrial Engineering*, 2013, 1-8.
- Dell’Era, C., & Landoni, P. (2014). Living Lab: A Methodology between User-Centred Design and Participatory Design. *Creativity and Innovation Management*, 23(2), 137-154.

- Evans, R. T., & Kilinc, E. (2013). History of Place-based Education in the Social Studies Field. *Journal Of Social Sciences / Sosyal Bilimler Dergisi*, 6(14), 263-280.
- Hawk, N., Bartle, G., & Romine, M. (2012). The Living Labs: Innovation in Real-Life Settings. *Quarterly Review of Distance Education*, 13(4), 225-231.
- Howley, A., Howley, M., Camper, C., & Perko, H. (2011). Place-Based Education at Island Community School. *Journal Of Environmental Education*, 42(4), 216-236. doi:10.1080/00958964.2011.556682
- Pipatpen, M. (2015). A New Alternative for Community-Based Education: A Look at Education with a Postmodernism Paradigm. *International Journal Of Behavioral Science*, 10(1), 67-76.
- Teece, D. (2016). Universities must 'think like business leaders' in face of financial cuts. *Times Higher Education*, (2270), 34-35.

# **A Culturally Relevant Design; Reframing, Reimagining, and Reengineering the College Transition Process**

Lori Suddick, Vice President of Learning  
Northeast Wisconsin Technical College

The face of education is changing as the demographic composition of the United States' population is becoming more racially and ethnically diverse. It is projected the nation will make the demographic shift where minorities will comprise the majority of the population base by 2044 (Colby & Ortman, 2014). The 18 years and under subset of the population will make the shift at a faster rate with a crossover by 2020. The shift of the minority demographic brings immediacy to solving the historic patterns of disparate postsecondary educational attainment for minorities.

According to the Census Bureau, baccalaureate degree attainment for those 25 years and older increased across all racial groups from 1988 to 2015 (Colby & Ortman, 2014). Despite the progress, disparities exist in degree attainment across racial groups reflected in both the percentage of degree holders, and the unchanged gaps between groups. In 2015, 54 percent of Asians, 36 percent of Whites, 22 percent of Blacks, and 15 percent of Hispanics held a bachelor's degree.

The American economy is also experiencing a change in composition. The number of unskilled jobs has steadily decreased, while the number of skilled jobs requiring at least a sub-baccalaureate credential has increased (Pulley, 2012). Projections indicate that nearly two-thirds of jobs in the next decade will require talent with at least some post-secondary education (Carnevale, Rose, & Hanson, 2012). Lagging postsecondary transition and degree attainment rates of the minority population threatens the economic health of the nation, as the American economy is increasingly dependent on a skilled and educated workforce. The call for reformed practices addressing disparities in educational attainment of minorities is identified as an economic imperative to optimize the nation's human potential and ensure a sufficient skilled workforce supply (Bedolla, 2010; Carnevale, Rose, & Hanson, 2012). Finding solutions to fill the skilled labor demand is an economic imperative if United States is to remain a leading competitor of global market.

The demographic profile of the teacher workforce in the United States lacks diversity. The cultural competence of educators is identified as a gap in the nation's ability to deliver equitable education for minority students (Castro, 2013; Cochran-Smith, Davis, & Fries, 2003; Cooper & Liou, 2007; Gay, 2010; Hollins & Torres-Guzman, 2005; Liou, Antrop-Gonzalez, & Cooper, 2009; Ladson-Billings, 2006; Welton & Martinez, 2014; Zumwalt & Craig, 2005). In 2011-2012, 82% of public school teachers were White while the public-school student population was only 51% White (U.S. Department of Education, 2016). The mismatch between the homogenous teacher profile and the anticipated crossover of the minority population to a majority of the demographic by 2020 is identified as problematic to solving the achievement gap (Knight & Marciano, 2013; U.S. Department of Education, 2016). There is a need for consideration of the impact that predominantly White teachers have on minority youth as they navigate the college-going process within the context of the school environment.

To capitalize on the rich multiracial and multiethnic plurality of the nation's future population, three priorities emerge in the literature. The first priority is to create college-going cultures within secondary education that offer comprehensive college and career planning (Barnett, 2016; Berger, Turk-Bicakci, Garet, Knudson, & Hoshen, 2014; Valentine, Hirschy, bremer, Novillo, Castellano, & Banister, 2009; Vargas, 2014; Vargas & Venezia, 2015; Webb & Gerwin, 2014). The second priority is the development of multicultural competence in all educational professionals who engage with students in college and career readiness planning (Castro, 2013; Cochran-Smith, Davis, & Fries, 2003; Cooper & Liou, 2007; Gay, 2010; Hollins & Torres-Guzman, 2005; Liou, Antrop-Gonzalez, & Cooper, 2009; Ladson-Billings, 2006; Welton & Martinez, 2014; Zumwalt & Craig, 2005). Within this priority, emphasis is placed on the need for educators to reframe their conceptualization of minority students by viewing one's cultural background as an asset versus a deficit (Holcomb-McCoy, 2003; Howard, Solberg, Kantamneni, & Smothers, 2008; Knight & Marciano, 2013). Transitioning to an asset-based conceptualization of minority students requires educators to portray the tenets of culturally relevant pedagogy while shedding the Eurocentric tenets that have largely influenced current college and career readiness practice (Flores & Heppner, 2002; Kerka, 2003; Knight, 2010; Knight & Marciano, 2013). The third priority shifts the focus from organizational infrastructure and educator competence to the student. To create culturally relevant college and career readiness practices, education professionals must reframe their own perceptions of minority students by gaining insight through the perceptions of students (Flores & Heppner, 2002; Kerka, 2003; Knight, 2010; Knight & Marciano, 2013).

To overcome the disparity in postsecondary transition rates of minority students, transformation of traditional practices primarily designed for white, middle to upper class students is necessary. The lack of cultural identity is seen as a gap in traditional college-choice process for students of color (Bergerson, 2009; Cabrera & LaNasa, 2000; Castro, 2013; Dial, 2014; Gay, 2010; Hossler & Gallagher, 1987; Hossler, Schmit, & Vesper, 1999; Welton & Martinez, 2014). There is a call for educators to reform the educational ecosystem to be more socially just ensuring all students have the opportunity to succeed. With an increasing minority population, amidst prevalent achievement gaps in a nation with economic dependence on a sufficient supply of a college-educated workforce, it is imperative transition rates of minority students to postsecondary education are improved. Literature supports the application of a culturally relevant design in college and career planning practices to foster a cultural college-going identity that may improve the postsecondary transition outcomes of America's minority youth.

In a recent survey of over 500 eighth grade students on culturally relevant college and career planning in a large, diverse urban Midwestern school district, 73% percent stated their goal after high school was to go to college or university. Approximately, 17% of the students were undecided with less than 4% planning to go directly to the workforce. Additionally, their mean average response to the statement "I believe students like me can go to college" was 8.26 on a 0 to 10-point scale. Of the survey participants, 63% self-identified as minority. These minority students hold the belief and the goal to achieve postsecondary transition. Yet, the school district's postsecondary enrollment rate for first fall semester after graduation in 2014-2015 was 58.7% with

White students transitioning to college at a higher rate than all other race and ethnicity groups. The need to reframe, reimagine, and reengineer the existing educational ecosystem for the growing minority population to improve postsecondary transition is clear. Designing the blueprint to insure students of color obtain postsecondary credentials at the same pace as their non-minority peers is less so. According to many experts in the field, the answers lie within the minds of minority students. Will we take the time to listen?

### References

- Barnett, E. (2016). *Building Student Momentum from High School into College. Ready or Not: It's Time to Rethink the 12th Grade*. Jobs For the Future.
- Bedolla, L. G. (2010) Good ideas are not enough: Considering the politics underlying students' postsecondary transitions. *Journal of Education for Students Placed at Risk*, 15(1), 9 – 26.
- Berger, A., Turk-Bicakci, L., Garet, M., Knudson, J., & Hoshen, G. (2014). *Early college, continued success: Early college high school initiative impact study*. Washington, DC: American Institutes for Research.
- Bergerson, A. A. (2009). College choice processes for students of color. *ASHE Higher Education Report*, 35(4), 63-83. Retrieved from <http://ezproxy.nwtc.edu:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ofs&AN=47276198&site=eds-live&scope=site>.
- Cabrera, A. F., & LaNasa, S. M. (2000). Three critical tasks America's disadvantaged face on their path to college. In A. F. Cabrera & S. M. LaNasa (Eds.), *Understanding the college choice of disadvantaged* (Vol. 107). San Francisco: Jossey-Bass Inc.
- Carnevale, A., Rose, S., & Hanson, A. (2012). *Certificates: Gateway to gainful employment and college degrees*. Center on Education and the Workforce, Georgetown University.
- Castro, E.L. (2013). Racialized readiness for college and career: Toward an equity grounded social science of intervention programming. *Community College Review* (in press).
- Cochran-Smith, M., Davis, D., Fries, M.K. (2003). Multicultural teacher education: Research, practice and policy. In J. Banks (Ed.), *Handbook of research on multicultural education* (2<sup>nd</sup> ed., pp. 747 – 759). San Francisco: Jossey-Bass.
- Colby, S. & Ortman, J. (2014). *Projections of the size and composition of the U.S. population: 2014 to 2060*. Current Population Reports. U.S. Census Bureau. Washington, DC.
- Cooper, R., & Liou, D. D. (2007). The structure and culture of information pathways: Rethinking opportunity to learn in urban high schools during the ninth grade transition. *The High School Journal*, 91(1), 43-56.
- Dial, M. G. (2014). Factors that affect the decision-making process of African American students. Retrieved from <http://cornerstone.lib.mnsu.edu/cgi/viewcontent.cgi?article=1292&context=etds> [See chapter 4]
- Flores, L. Y., & Heppner, M. J. (2002). Multicultural career counseling: Ten essentials for training. *Journal of Career Development*, 28(3), 181-202.

- Gay, G. (2010). *Culturally responsive teaching: Theory, research, & practice*. New York: Teachers College Press.
- Holcomb-McCoy, C. (2003). Multicultural competence. *Transforming the school counseling profession*, 317-330.
- Hollins, E. & Torres-Guzman, M.E. (2005). Research on preparing teachers for diverse populations. In M. K. Cochran-Smith & K. Zeichner (Eds.), *Studying teacher education: The report of the AERA Panel on Research and Teacher Education* (pp. 477-448). Mahwah, NJ: Lawrence Erlbaum Associates.
- Hossler, D., & Gallagher, K. S. (1987). Studying student college choice: A three phase model and the implications for policymakers. *College and University*, 62(3), 207 – 221.
- Hossler, D., Schmit, J., & Vesper, N. (1999). *Going to college: How social, economic and educational factors influence the decisions students make*. Baltimore, MD: The Johns Hopkins University Press.
- Howard, K. A., Solberg, V. S. H., Kantamneni, N. E. E. T. A., & Smothers, M. K. (2008). Designing culturally responsive school counseling career development programming for youth. *Handbook of school counseling*, 269-289.
- Kerka, S. (2003). Career development of diverse populations. ERIC Digest. Columbus, OH: ERIC Clearinghouse on Adult and Career Vocational Education. ERIC Identifier ED482536.
- Knight, M. (2010). Enacting care, preparing for college and increasing access for Black youth. *Journal of Students Placed at Risk*, 15(2), 158-172.
- Knight, M., & Marciano, J. (2013). *College ready: Preparing Black and Latina/o youth for higher education a culturally relevant approach*, New York, NY: Teachers College Press.
- Ladson-Billings, G. (2006). From the achievement gap to the education debt: Understanding achievement in U.S. schools. *Educational Researcher*, 35(7), 3 – 12.
- Liou, D.D., Antrop-González, R., & Cooper, R. (2009). Unveiling the promise of community cultural wealth to sustaining Latina/o students' college-going information networks. *Educational Studies*, 45, 534-555.
- Pulley, J. (2012). *Working credentials: Sub-baccalaureate degrees, certificates are paying off for students and employers*. Indianapolis: IN. Lumina Foundation. Focus, Fall 2012.
- United States. Department of Education. (2016). Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service, *The state of racial diversity in the educator workforce*, Washington, D.C.
- Valentine, J.C., Hirschy, A.S., Bremer, C.D., Novillo, W., Castellano, M., Banister, A. (2009). *Systematic reviews of research: Postsecondary transitions identifying effective models and practices*. University of Louisville, Louisville: KY. National Research Center for Career and Technical Education.
- Vargas, J. (2014). *Sharing responsibility for college success: A model partnership moves students to diplomas and degrees*. Boston, MA: Jobs for the Future.
- Vargas, J., & Venezia, A. (2015). *Co-design, co-delivery, and co-validation: Creating high school and college partnerships to increase postsecondary success*.

Retrieved from Washington, DC. <http://www.jff.org/initiatives/early-college-designs/ready-or-not-its-time-rethink-12th-grade>.

- Webb, M., & Gerwin, C. (2014). *Early college expansion: Propelling students to postsecondary success, at a school near you*. Boston, MA: Jobs for the Future.
- Welton, A. D., & Martinez, M. A. (2014). Coloring the college pathway: A more culturally responsive approach to college readiness and access for students of color in secondary schools. *The Urban Review*, 46(2), 197–223.
- Zumwalt, K., & Craig, E. (2005). Teachers' characteristics: Research on the demographic profile. *Studying teacher education: The report of the AERA panel on research and teacher education*, pp.111-156. Mahwah, NJ: Lawrence Erlbaum Associates.

# Recommendations

Following the final panel, participants moved into breakout groups and were asked to reflect on the following questions:

1. What role can you play as part of the larger collaborative system of career and technical/workforce education to prepare students for the ever-changing workplace? And who else needs to be engaged in making these changes?
2. What opportunities do you see for moving forward collectively to prepare students for an evolving, ever-changing workforce that will be different in 2027 than it is today?

The following recommendations reflect participants' reactions to panelists' remarks.

***A collaborative effort is needed to address pressing issues involved in the advancement of the status of career and technical education and in the preparation of students for the ever-changing workplace.***

Career and technical educators and their stakeholders envision their role in the promotion of career and technical education. This includes the need to recruit and prepare teachers who model best practices while being attentive to the unique needs of under-served and under-represented populations.

## **Build Awareness and Promote CTE**

***Educators, stakeholders, partners and students all have a role in promoting in building awareness and promoting CTE.***

To better promote career and technical education the profession must examine the role of career and technical education and consider the stakeholders' needs and values. Our message should be collaboratively developed with input from and targeted for parents, students, professional organizations, employers and legislative bodies. The rationale for career and technical will be stronger if it represents a consistent message that showcases high achieving students benefiting from exemplary practice supported by strong partnerships. For success, advocacy must be a collaborative effort.

## **Implement and Model Best Practices**

***Career and technical educators have an obligation to provide relevant and quality academic instruction.***

The fast pace of technological change requires career and technical educators to constantly monitor changes in occupations, advancement in teaching practices, and community needs to provide students with up-to-date curriculum that address these changes and innovations. This will involve fostering higher order-thinking, facilitate experiential learning levels, apply academic skills and concepts, emphasize academic and career planning, and capitalize on student organizations. Finally, the profession needs to

recognize excellence and quality instruction to provide stakeholders with exemplars that can inspire growth within career and technical education.

### **Engage Stakeholders**

***To effectively deliver career and technical education, thus preparing tomorrow's workforce, will require the involvement and support of a broad base of stakeholders***

Educators, as well as business and industry leaders, recognize the positive impact of collaboration across sectors in both the planning and delivery of career and technical education. While the educational system may be well prepared in the methods of instructional delivery, business and industry can play a vital role in focusing the system on current needs and future trends. Professional organizations can provide standards that need to be achieved during instruction. Parents and community organizations are positioned to support and encourage youth preparing for their future. Together these partners can work in collaboration to increase and enrich student experiences in career and technical education.

### ***Address under-served and under-represented populations***

Career and technical education is for all students; yet, some students are more represented in our programs and places of employment than others. Consequently, more emphasis needs to be placed on creating welcoming communities of practice that embrace the cultural values of diverse populations, minimize barriers to success, and ensure culturally appropriate curriculum and instruction. Addressing this need will require recognizing different populations bring different assets and perspectives to the enterprise. Members of these populations tend to thrive when educators recognize and value relationships with people more than the institution, share work and responsibility within a community united by a common purpose, conform to norms and honor family through achievement with humility, and pursue harmony and balance by recognizing relationships within and among all things. All students benefit from role models, mentors, inclusive language and imagery, access to resources, and respect for traditions that acknowledge one's identity, past experiences, values and goals. In contrast to the deficiencies that emerge when traditional measures are applied to diverse populations, under-served and under-represented populations bring unique aptitudes, points of view, and ways of doing that can enrich the teaching and learning process for all students as well as the world of work.

### ***Recruit, prepare, and retain CTE teachers***

The concept "It takes a village..." can be applied to recruiting, preparing, and retaining career and technical education teachers. According to this ancient African proverb, it takes the combined efforts of a community to properly prepare a child for adult life because the work is simply too challenging and important to rest on the shoulders of the parents. The same can be said for the matriculation, education, induction, and professional development of CTE teachers. To ensure the growth and development of the profession, all members of the CTE community need to identify talent within our ranks,

guide them to further education, render support as needed, mentor them into the profession, and provide professional development by sharing expertise.

# Analysis of Participants' Vision for CTE

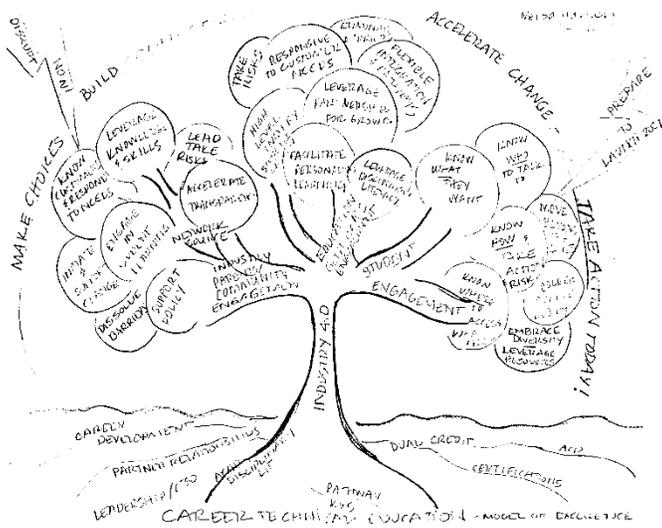
As attendees progressed across three breakout sessions, they were asked to reflect on the questions asked and facilitated discussions, then were prompted to visually illustrate their thinking through a picture.

The resulting pictures were later analyzed to uncover meaning. A three-stage reduction technique was employed in analyzing drawings. In stage one all breakout session facilitators completed a cursory review of the drawings looking for major themes and ideas in the drawings. During stage two, two of the session facilitators reviewed the drawings independent of one another. The two session leaders in stage three discussed and analyzed the drawings. Collectively the two reviewers noted a prominence of themes that were overtly stated, or implied, as well as ideas that were totally absent. During the process they compared and contrasted their analysis, resulting in consensus of major themes evident in each of the drawings. Finally, the drawing analysis was returned to the larger group of CTE faculty facilitators for final review of the emerging models and themes.

Three types of models emerged from the drawing analysis of what CTE would look like in ten years. These included a growth model, a cycle model, and a culturally contextual model. An exploration of the recurrent themes from the models follow.

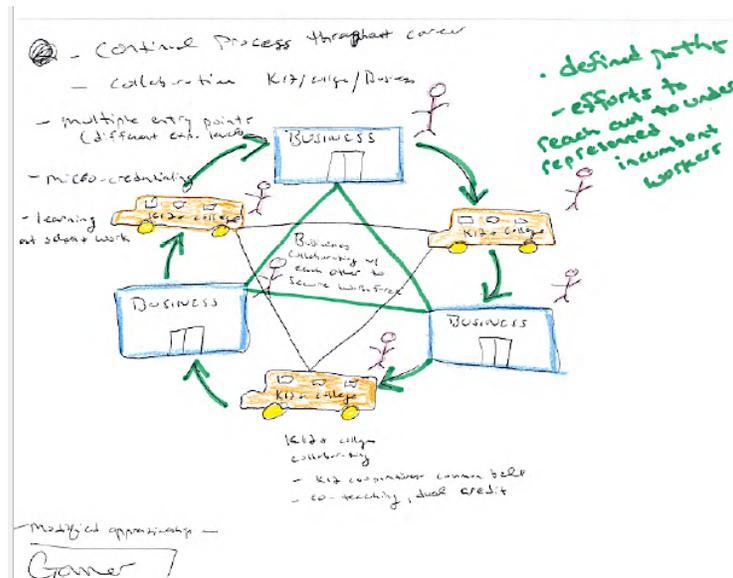
## **Growth Models**

Growth models included symbols that indicated growth over time. Examples, shown below, used tree, plants and rising stair steps to show this growth. The models frequently tied elements of a larger system into the drawing indicating growth by both the individual and the larger system. The drawings were tied to assumptions of the American economy and the assumption that economic growth is necessary and sustainable. The mindset reflects the current tenor of American culture and assumptions based on capitalistic societies. However, it is not clear if continual economic growth can be sustained over long periods of time. The underlying assumption that growth is good, and that growth is sustainable reflects our capitalistic society and socio-political times. There was some indication that CTE leaders and facilitators should be looking long-term and not focusing on short term goals only.



The message of lifelong learning and personal growth were found in both the growth model (left) and the cyclical model (below). Participants indicated that growth, both personal and institutional, will occur over a long period of time. For individuals, this includes their lifetime. The diagrams suggest a need to rethink educational delivery models and partnerships that include multiple access points to the education enterprises. Digital access has changed learning in that learning can be distributed asynchronously

as well as synchronously. The learning and educational enterprise are morphing as a result. Instruction is being transitioned from an expert teacher guiding learners in group experiences to Just in Time (JIT), personalized instruction. Instruction based on experience, instead of age, will require change in instructional methods that blend elements of andragogy and pedagogy based on the needs of individual learners.

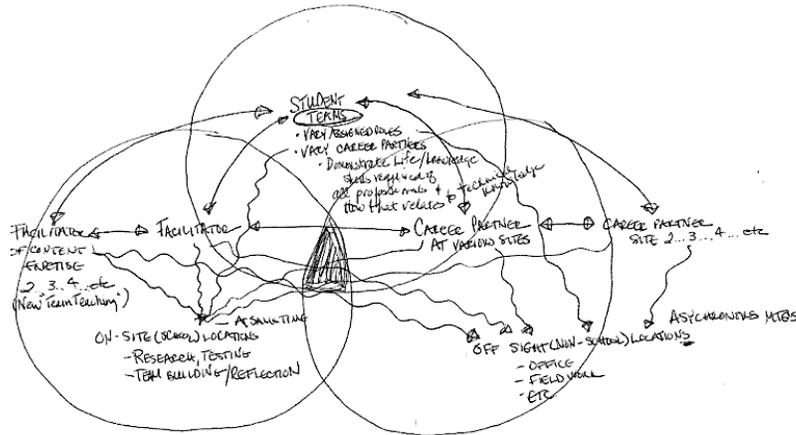


### Cyclical Learning Models

Cyclical learning models start with a variety of inputs that involve skills, aptitudes and attitudes. These skills are influenced by both formal and informal means and a larger community context. As learners develop within their personal and professional lives they need to learn, and this starts the cycle anew. The models include multiple entry points to the education and training needs of the individual learner. Partnerships between schools and business/industry help meet the needs and interests of the individual as they move through a lifetime of continuous learning and skill development.

## Cultural Models

Cultural models reflect the idea that CTE is part of a larger whole occurring within a



cultural context. Waves were used to indicate an ever-expanding sphere of influence that CTE initiatives might have. Wheels indicated the interdependence of cultural, social, and political agents that impact CTE experiences that revolve around the individual learner as a central hub.

There is an implication that all elements of the culture, the educational institutions, legislators, parents, business/industry, economic factors, i.e. “the culture”, need to work as a unified whole or the wheel goes flat and doesn’t function the way it was intended.

## Overarching Themes

Several themes ran through the drawings regardless of which model was referenced. It is helpful to look at these themes within the context of the CTE enterprise. The major themes addressed include:

- Tension between Trades and Industry (T & I) and Career and Technical Education (CTE)
- Innovation and risk
- Relationships

Tensions between CTE and T&I exist relative to community needs, government regulation, and individual learner interests. There is a call for foundational shifts in the way that CTE interfaces with the local community and partners with stakeholders. Additionally, the images illustrated an overt absence of specific industry or industry-based skills. Participants viewed CTE as becoming the change agent to offer local opportunities. Twenty-first century skills, core competencies, and legislative requirements were often referenced in the drawings. Tension between CTE and T&I paradigms were also reflected. Equity between the needs of small and larger communities were important to consider. The needs of the community and the resources brought to bear on workforce development are quite different from rural to urban areas. CTE embeds academic skills enabling “college and career ready” individuals with core competencies and foundational skills for students looking at a broad range of opportunities. This is further highlighted as an evolution of enduring core abilities, skills and dispositions that all learners need to merge into their learning and earning journey across their life-span. T&I includes the foundational skills needed to do a job supporting a local economy. The opportunities that are available within a local community will

impact how stakeholders envision what CTE “looks like.” There is not a unified vision of what that is or should be.

Innovation in course delivery and career awareness became a theme. Closely associated with the idea of innovation was the recognition of the need for risk taking. If CTE is to become innovative in its practices, then risk taking is necessary to disrupt current education practices and strategies. Many folks are looking for alternatives to the current system of education including moving away from siloed courses and more authentic learning contexts. Career awareness needs to start at the middle school level according to some. Additionally, the drawings recognized a need for advancing curriculum and methods/strategies responsive to hyper knowledge, as well as skills and dispositions life-cycles that span across both informal and formal business and industry education and training.

Entrepreneurship was mentioned frequently. This ties into several factors found in society today. First, Fab Labs are being funded and is a buzz word in Wisconsin. Participants may be triggering off of this idea. Also, there is currently a cultural shift in the way individuals are employed, with an increase in part-time work opportunities. Smaller communities don't have the resources or a way to prepare students for a world of work under the 1950s – 1970s paradigm of larger corporations and corporate loyalty for life. Innovation and entrepreneurship appear to be tied to the idea of growth and/or lifelong learning. This captures the mindset of today's educators which may reflect social change.

Learner – centered instruction was a theme evident in many of the drawings. They indicated that the interests and aptitudes of the learner should be accounted for. Learning occurs in a larger “community” context with positive relationships between stakeholders. Sometimes the drawings reflect a school-only community. Other times drawings reflected a larger community context. A theme running through many of the drawings was the idea that the responsibility of learning should be released to the learner as they decide when, where and how they will improve their work-related skills and ideas. Implicit in this idea is the need to integrate pedagogical and andragogic approaches based on students' experience. Interconnected life, learning, and earning systems were illuminated through the drawings and text, intertwined with technical, conceptual and problem-solving skills development that advance through an interconnected yet distributed education and training system. Drawings represented a system that includes a multitude of learning and skill development access points, with formal and informal learning across education and business and industry settings. These drawings closely resemble Bronfenbrenner's Bioecological model of development (see <https://www.youtube.com/watch?v=5htRhvm4iyI>)

Relationships was the final overarching theme addressed in the drawings. Evidence of relationship building was evident in artists' depictions of all stakeholders working together. This included non-siloed instruction, stakeholder partnerships, and CTE being a part of a system. Relationships were also evident in the learner's relationship to their education and their taking ownership of their life-long personal development.

## Appendix A: Speaker Biographies

**Dr. Bryan Albrecht** serves as President and CEO for Gateway Technical College. He received his Bachelors, Masters and Education Specialist Degrees from UW-Stout and a Doctorate in Education from the University of Minnesota. Dr. Albrecht is widely known in the education and workforce and economic development communities through his service to numerous national associations, including as President of the American Technical Education Association and a member of the Executive Board for American Association of Community Colleges.

Among his many accomplishments, Bryan has been an invited speaker at the White House, testified before the U.S. Congress and represented U.S. community colleges at the United Nations. His travels have taken him throughout the world advocating for career and technical education as a pathway of hope, dignity and opportunity. He is most proud of his strong relationship with UW-Stout and the graduate students he continues to work with through the Ed.D. Program. This is Bryan's 33rd year as a career and technical educator.

### **Dr. David Hay**

Dr. David Hay serves as the Director of Organizational Effectiveness to School Chancellor Carmen Farina who leads the New York City Department of Education. In his role as Director of Organizational Effectiveness, Dr. Hay leads a comprehensive organizational effectiveness and change management strategy. He works with the senior leadership team to align the Department's work to the Chancellor's vision of Equity and Excellence for All. He is responsible for developing, coordinating and institutionalizing strategies to increase individual and operational coherence, change management, and internal communications capabilities to support the achievement of strategic goals.

David received his Doctor of Education Leadership (Ed.L.D.) from the Harvard University Graduate School of Education. He received his Bachelor of Science in Marketing Education from the University of Wisconsin-Stout, and his Master of Science in Administrative Leadership from the University of Wisconsin-Milwaukee. Most recently Hay served as principal of Tomah High School in western Wisconsin, where he led an aggressive turnaround that resulted in the closing of a 17-percentage point gap in mathematics in just three years.

Hay previously served as high School Principal and Director of Research & Development for the School District of Kettle Moraine in Wales, Wisconsin – a suburb of Milwaukee. He led the development of two high performing charter high schools that operate within the traditional high school building, that blur the lines of traditional subjects through the lens of the arts, and global leadership respectively. Both schools have been recognized by the US Department of Education, in addition to local and national media, for their work focused on schools designed for the future.

**Dr. Jay W. Rojewski** is a professor of Workforce Education in the Department of Career and Information Studies at the University of Georgia. He received his Ph.D. in Education Administration, Curriculum and Instruction from the University of Nebraska-Lincoln. Dr. Rojewski has received numerous teaching and research awards. His research focuses on career aspirations, career preparation and development, and career behavior of adolescents and young adults in the process of transition from school to work and adult life.

**Dr. Kyle Hartung** is Program Director for Pathways to Prosperity at Jobs for the Future (JFF). Kyle guides the network and related Pathways initiatives in the design, development, and ongoing improvement of college and career pathways. He also contributes to JFF's systems-level regional and state education policies and partnerships supporting the transition of credentialed young people into the labor market.

Dr. Hartung brings to JFF 18 years of experience as a teacher, leader, consultant, and researcher in public K-12 and higher education settings, where he has worked to advance innovations in education that can transform our conceptions of the what, how, when, where, and why of learning, in all its forms. His areas of expertise include deeper learning, college and career readiness, performance- and competency-based assessment, workplace learning, project- and problem-based pedagogy, school design/redesign, adult learning, and mixed-methods research.

Dr. Hartung holds a bachelor's of fine arts in performance studies from the University of Illinois-Urbana, master's degrees in education from The New School and Harvard University, and a doctor of education in educational leadership, policy, and practice from Harvard University.

**Sharon Wendt** has been with the Department of Public Instruction (DPI) since 1994. In the fall of 2007, Sharon began her role as Director of Career and Technical Education. As director of CTE, Sharon assists in the development and implementation of program policy and budget affecting career and technical education programs and services in Wisconsin PK-12 public schools. Prior to becoming director, Sharon served as a DPI Agriculture Education Consultant and a School Administration Consultant for Charter Schools.

In her leadership role, Sharon works with state and federal legislation, grants administration, and provides leadership support for district-wide collaboration, as well as for developing partnerships with employers and other community groups to better prepare students for all post-high school opportunities. Sharon serves as State Superintendent Tony Evers' designee to the Wisconsin Technical College System Board, the Governor's Council on Workforce Investment, and the Wisconsin Agriculture Education and Workforce Development Council.

Sharon earned her Bachelor's degree in Agricultural Education from the University of Wisconsin-River Falls and her Master's Degree in Educational Leadership from Cardinal Stritch University.

**Dr. Bob Meyer** is currently the Chancellor at the University of Wisconsin-Stout, where he previously served as Assistant to the Chancellor for State and Federal Relations; Dean of the College of Technology, Engineering, and Management (CTEM); Northwest Wisconsin Manufacturing Outreach Center Director (NWMOC), a NIST/MEP affiliated center; and Manufacturing Engineering Program Director. Immediately prior to returning to UW-Stout as Chancellor, Dr. Meyer was President of Wisconsin Indianhead Technical College. Dr. Meyer is also a proud graduate of UW-Stout, earning a BS in Industrial Education and an MS in Manufacturing Management. He earned his Ph.D. in Industrial Engineering at the University of Minnesota.

Dr. Meyer has broad experiences in technical education prior to moving into higher education, working as a Technology Education Instructor in the River Falls School District; a General Machinist at Johnson Brass and Foundry (Saukville, WI); and as a General Machinist at Badger Dynamics (Port Washington, WI). Throughout his career he has also participated in and served on the boards of numerous manufacturing, engineering, and workforce education organizations across the region and state.

**Jim Morgan** is Vice President of Member Experience at MRA, a management company in Waukesha, WI. Prior to this he was Executive Director of Wisconsin Manufacturers and Commerce. Jim has facilitated strategic planning sessions for businesses, chambers of commerce, and economic development groups, primarily around developing a talent pipeline for employers. He has also coordinated a statewide initiative to address Wisconsin's talent shortage, facilitated local business and education partnerships designed to attract and maintain talent, and conducted focus groups and surveys designed to identify Wisconsin's strengths and weaknesses as a place to live, work, and play. He has provided keynote presentations for groups from 50 to over 1000. CEOs, policymakers, educators, and students have enjoyed his mix of data, experiences, research, stories, and humor.

Jim holds a master's degree in education and a bachelor's degree in education from the University of Wisconsin-Madison.

**Dr. Morna K. Foy** is president of the Wisconsin Technical College System (WTCS), which includes 16 technical colleges that serve more than 300,000 students each year. She has more than 25 years of experience in higher education policy development and leadership, and served as executive assistant and vice president of policy and government relations prior to becoming president. Dr. Foy believes in the power of technical education to enrich lives and strengthen Wisconsin's economy. The result is a sharp focus

on the innovation necessary to deliver relevant, valuable learning opportunities for students at every stage of their lives and careers, and a reliable talent pipeline for employers in every sector and region of the state.

Dr. Foy holds a BA in Economics and Political Science from the University of Wisconsin (UW)-Madison, an MPA in Finance and Policy from Indiana University, and a doctorate in Education Leadership and Policy Analysis from UW-Madison.

**Russ Tronsen** is currently the Principal at Badger High School in Lake Geneva, Wisconsin. Prior to entering into administration Tronsen worked in the Foodservice and Hospitality Industry performing many roles from prep cook, kitchen supervisor, executive chef and consultant. During those years, Tronsen earned his Bachelor of Science in Family and Consumer Sciences Education from the University of Wisconsin Stout. Tronsen took his skills and degree and began his formal teaching career at Badger High School in 2000. He developed a culinary and hospitality program that grew into one of the most highly recognized programs in the state of Wisconsin and the nation. Tronsen's program has earned several accolades over the years, including 9 State Championships in ProStart Culinary and 4 State Championships in Management. Badger is the only school in Wisconsin to have won the National ProStart Student Invitational in Culinary (2008) and Management (2013).

In addition to his Bachelor of Science degree, Tronsen earned a Master's Degree in Educational Technology from Marian University and Educational Leadership certification from Concordia University. Tronsen left the classroom to become Principal of Badger High School in 2016. Tronsen is still active in the foodservice and hospitality industry through his work with the Wisconsin Restaurant Association Education Foundation where he is serving as Chairman of the Board.

**Dr. Christopher Neff** has been the Director of Career and Technical Education with the Racine Unified School District (RUSD) since May of 2015. As part of the Office of Secondary Transformation led by Dan Thielen, Dr. Neff assists in the implementation of wall-to-wall career academies at the three major high schools in RUSD: Case, Horlick and Park. His responsibilities include CTE programming, CTE curriculum, work-based learning, employer and community partnerships, CTE-related grants (i.e. Carl Perkins, WI CTE Incentive), CTE data collection, dual credits with Gateway Technical College, industry certification implementation, and teacher professional development related to the Academies.

Dr. Neff completed his Ed.D. in CTE from UW-Stout in 2017, with the support and guidance of his family, the program faculty and director (Dr. Urs Haltinner), the Pioneer Cohort, colleagues, his research chair (Dr. Carol Mooney) and committee (Dr. Deanna Schultz and Dr. Bryan Albrecht) culminating in completing his dissertation topic: manufacturing employer engagement with career academy high schools.

**Dr. Josh Gamer** is Dean of the Integrated Technology Division at Western Technical College in LaCrosse, WI. His career began like many students in the Wisconsin Technical College System (WTCS). Upon graduating high school, he immediately secured work within industry rather than pursue post-secondary education. After finding initial success in the manufacturing sector, he then opted to begin his educational journey as a non-traditional student, taking classes in the evening while working the production floor during the day. While a student, Josh held roles ranging from production laborer, lead, supervisor, continuous improvement coordinator, and eventually, director of operations. His increased roles of responsibility coincided with each degree he completed. Josh's first degree was an Associates Degree in Supervisory Management, followed by a Bachelors in Business, and a Masters in Business Administration. A poor economy in 2009 eventually caused Josh to switch industry sectors and he found himself in academics.

Josh began his academic career as a fulltime instructor in the Supervisory Management program at Western Technical College. There, he taught primarily online and blended classes to working adults. During this time, he also delivered over 60 seminars to local businesses in the areas of quality management, leadership, manufacturing skills, team building and problem solving, and change management. Josh went on to become the Associate Dean of Business and eventually, the Dean of the Integrated Technology Division at Western. In 2017, he completed his Ed.D in Career and Technical Education at UW-Stout.

**Dr. Lori Suddick** is the Vice President of Learning and Chief Academic Officer for Northeast Wisconsin Technical College, a designated Leader College of Achieve the Dream. Lori values the opportunity and privilege to work with the innovative, collaborative, and talented team of faculty and staff at NWTC. Her previous positions included Associate Dean of Allied Health and faculty member. Lori served as lead for the College's engagement in the national AACC Guided Pathways project and iPASS2, as well as co-lead for the Frontier Set Network. She also engaged in several strategic teams, committees, and grant projects at the College. Lori was a 2016-2017 Aspen Presidential Fellow and received her Ed.D. in Career & Technical Education from the University of Wisconsin-Stout in 2017. In 2018, Dr. Suddick became president of the College of Lake County in Grayslake, Illinois.

## Appendix B: Participant List

Bryan Albrecht  
Gateway Technical College

Robert DeLain  
Kimberly School District

Maria Alm  
UW-Stout

Kevin Dietsche  
UW-Stout

Sara Baird  
Department of Public Instruction

Shaun Dudek  
UW-Stout

Jeff Ballentine  
Altoona School District

Mark Eckmann  
Belvidere North High School

Carolyn Barnhart  
American Association of Family and  
Consumer Sciences

Allan Erickson  
Milwaukee Public Schools

Barb Bauer  
UW-Stout

Stacy Eslick  
WI School Counselor Association

Rachel Bausman  
Blaine High School

Tim Fandek  
Department of Public Instruction

Mark Beise  
Northern Lakes Regional Academy

Morna Foy  
Wisconsin Technical College System

Phillip Bickelhaupt  
Wisconsin Rapids Public Schools

Julie Furst-Bowe  
Chippewa Valley Technical College

Chuck Bomar  
UW-Stout

Josh Gamer  
Western Technical College

Kathy Brock  
UW-Stout

John Goodman  
CESA 10

Tim Buttles  
UW-River Falls

Urs Haltinner  
UW-Stout

Melisa Hansen  
Hudson School District

Bob Meyer  
UW-Stout

Dale Hanson  
Appleton School District

Christina Mitchell  
Wisconsin Rapids Public Schools

Kyle Hartung  
Jobs For the Future

Carol Mooney  
UW-Stout Professor Emeritus

David Hay  
New York City Public Schools

Bob Morehead  
Chetek/Weyerhaeuser School District

Lisa Hickman  
Northeast Wisconsin Technical College

Jim Morgan  
MRA

Samantha Hoyt  
Menomonie High School

Chris Neff  
Racine Unified School District

Ginelle Hussin  
Boldt Company

Gindy Neidermyer  
UW-Stout

Steve Jahn  
Momentum West

Ben Niehaus  
School District of Florence

Matthew Janisin  
Gateway Technical College

Annette Ohern  
LaCrosse Area School District

Barb Jascor  
Mid-State Technical College

Mark Parsons  
UW-Stout

Diane Klemme  
UW-Stout

Dana Pavelsky  
UW-Stout

Cheryl Kothe  
Kenosha Unified School District

Maxine Peterson  
MN Department of Education

Cindy Quilling  
Wisconsin Association of FCS

David Thomas  
Department of Public Instruction

Laura Reisinger  
UW-Stout

Sylvia Tiala  
UW-Stout

Jay Rojewski  
University of Georgia

Russ Tronsen  
Badger High School

Diane Ryberg  
Department of Public Instruction

Mark Tyler  
OEM

Deanna Schultz  
UW-Stout

Gene Welhoefer  
Three Lakes School District

Lee Smalley  
UW-Stout Professor Emeritus

Ken Welty  
UW-Stout

Damon Smith  
School District of Cadott

Sharon Wendt  
Department of Public Instruction

Debbie Stanislawski  
UW-Stout

Steve Yahr  
Three Lakes School District

Ryan Sterry  
Menomonie High School

Linda Young  
UW-Stout

Danielle Stiebs  
Oak Creek High School

Josh Zalewski  
Antigo High School

Lori Suddick  
Northeast WI Technical College

Jeff Sullivan  
Chippewa Valley Technical College