

How Do We Do It?

Leverage State Agency Resources

With the urgency of change that is needed for our new Oklahoma economy, CTE will need a greater reliance on project teams to respond quickly to employer needs and demands. Using project-based teams with broad agency representation provides the flexibility required to create dynamic pathways for students. We must align learning standards in full-time high school courses, technology center courses, skills center programs, customized business and industry training or short-term courses. The delivery method should be driven by the knowledge and skill requirements industry demands and by the convenience of the learner. The Oklahoma Department of Career and Technology Education must lead by expecting the state program areas to create logical pathways within each Cluster and connect the knowledge and skills necessary to achieve state or national certification, licensure and degrees.

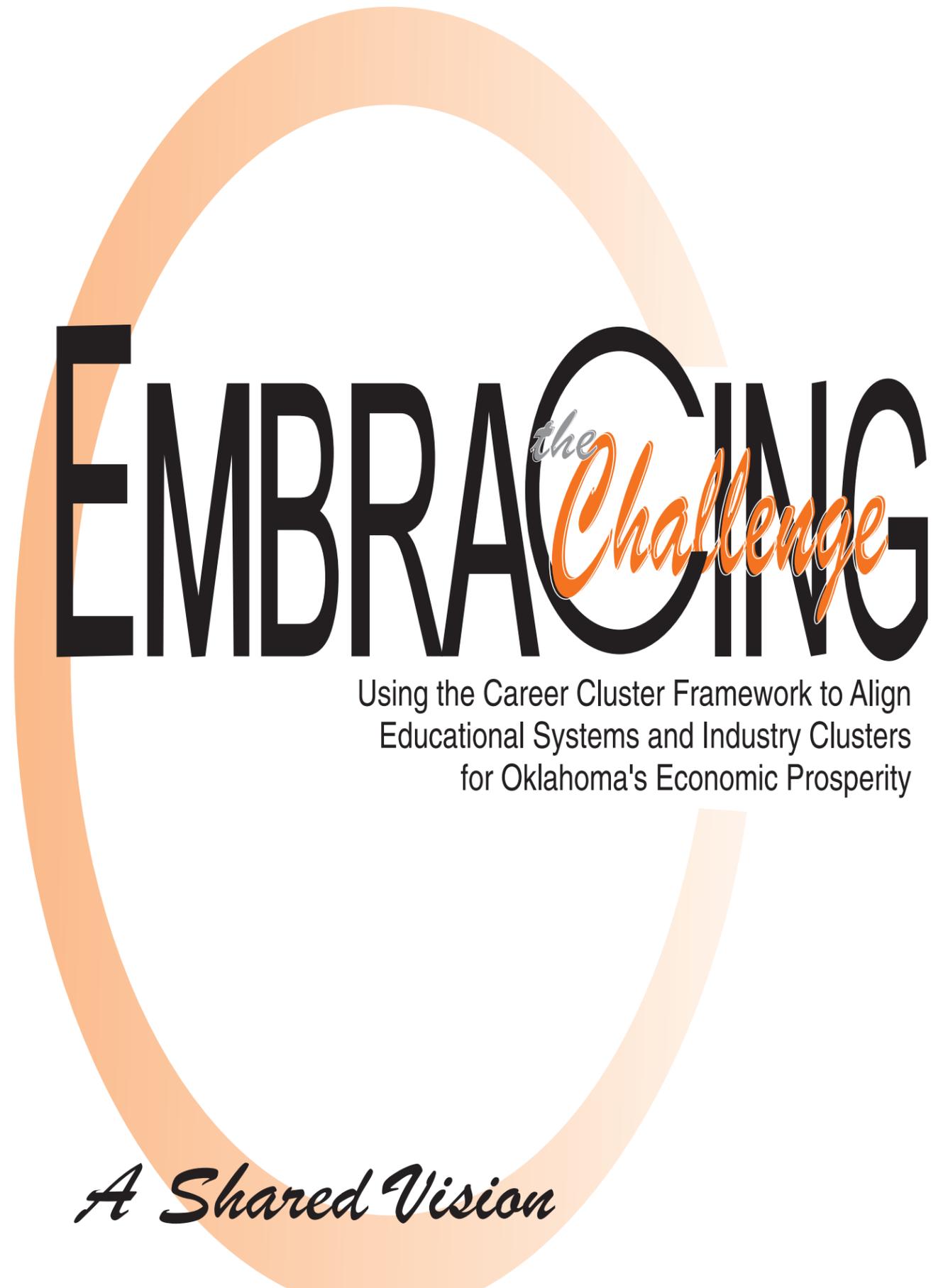
Within the structure of industry-endorsed Career Clusters, CTE should commit publicly to move forward and embrace these new structures and to strengthen our system of accountability for learner competency gains and instructional integrity. Technical assistance and professional development are critical for preparing our system to implement the new vision of CTE. We have technology centers committed to implementing these Cluster and pathway structures with great flexibility for students, but more and more often we are working to find ways around our structures rather than to innovate and utilize technology-based solutions to support such innovation. System guidance staff must facilitate the change by shifting emphasis from program recruitment to individualized education and career planning. We will utilize federal legislation and funding to move the system forward and rely on research and knowledge management to accelerate change and embrace innovation. Instruction should drive infrastructure and support, not the other way around.

CTE can be a corner post in this state's future if we are bold enough to move forward now. The future of our system, as well as the economic vitality of our state, depends upon a new, bold vision for Oklahoma's system of Career and Technology Education.

Career Clusters and pathways are powerful tools that can be used to quickly innovate our programs. The focus is not to merely implement Career Clusters but to use the framework of national research and skill validation as a springboard to move our system forward at lightning speed. Without these changes to the current structure, the innovative system of CTE will stagnate, and this will reduce our ability to help create the pipeline of highly skilled Oklahomans required to create a vibrant economy in new areas.

Our actions in the next few months must ensure that the use of Career Clusters is one of our most powerful strategies in implementing the CTE strategic plan. Our actions will determine if we have a system that moves at the speed of business. The choice is ours . . . we can embrace a new vision of CTE that builds upon the best of our strong heritage or manage our decline. The future belongs to a technically prepared workforce. CTE

can be a corner post in this state's future if we are bold enough to move forward now. The future of our system, as well as the economic vitality of our state, depends upon a new, bold vision for Oklahoma's system of Career and Technology Education.



EMBRACING *the* Challenge

Using the Career Cluster Framework to Align Educational Systems and Industry Clusters for Oklahoma's Economic Prosperity

A Shared Vision

Why Career and Technology Education Is Being Impacted by Change

The Oklahoma Career and Technology Education (CTE) system was called upon to be bold in the 1960s in creating a new educational approach to meet the demands of a more technological society. That call is being heard again in the 21st Century. This system must continue to provide unique educational options and continue to evolve as a catalyst for enhancing attainment of nationally validated knowledge and skills required for employment in a knowledge-based economy. Career and Technology Education must assume a leadership role in forging a new knowledge-based economy for our state.

A highly educated workforce is the key to successful wealth creation and economic prosperity in Oklahoma. Technically skilled and highly educated workers are needed at all levels, and they must have the capacity for lifelong learning that is demanded by business and industry. If Oklahoma is to be successful in educating the workforce for the future, all parties involved—government, education and business—must forge a unified vision of a prosperous, thriving and internationally competitive state.

Strategies for Economic Prosperity Are Changing

The newly formed Governor’s Council for Workforce and Economic Development has adopted the national framework of 16 Career Clusters upon which to base its work to connect career development from middle school through college and to connect industry clusters for economic development and employment opportunities. The Governor’s Economic Development Action Plan (EDGE) states, “Industry clusters, such as aerospace, agriculture, biotechnology and biomedicine, construction, energy, manufacturing, telecommunications and nanotechnology, all benefit from innovations in products and services and from sharing knowledge.” The U.S. Department of Labor’s High-Growth, High-Wage Initiative has also identified a focus on industry clusters including advanced manufacturing, automotive construction, energy, financial services, health care, hospitality, information technology, retail and transportation.

The Council is identifying those state industries that are at-risk, new and emerging, those that

must be sustained statewide, and those that must be grown to benefit rural and urban Oklahoma. The process will also include priority pathways that will enhance the economic growth of our state. In response, Oklahoma CTE programs, embracing business and workforce demand, will evolve to look very different from the model we have today.

Dr. Willard Daggett, International Center for Leadership in Education, stated recently that nationwide, “Career and Technical Education has two choices: we can manage change or manage our decline.” If the Oklahoma CTE system does not fully embrace this economic development structure to adequately align and prioritize resources and make maximum impact on the current and future workforce of our state, then the system will be choosing to manage its decline.

“Career and Technical Education has two choices: we can manage change or we can manage our decline.”

Dr. Willard Daggett
International Center for Leadership in Education

Career Knowledge and Skill Requirements Are Changing

The key to Oklahoma’s future growth lies in preparing our current and next generation employees with skills that are in demand by the most technically advanced employers. This will be the key to the future of Oklahoma’s growth.

Futurists believe that jobs of the future will require higher-level skills. While we cannot know which technical skills will be most in demand, we must concur that those skills will include technical reading and writing; problem-solving; mathematical calculation; accessing, evaluating and synthesizing information; manipulating technology; and project-based teamwork. In fact, Dr. Daggett states that entry-level blue-collar jobs will require a higher reading level than managerial white-collar jobs. We must commit to developing lifelong learners within the context of a technological society.

How Do We Do It?

Leverage Our Strategic Plan to Link With the State’s Economic Vision

Huge changes in the way Oklahoma views workforce and economic development are represented by “The Power of E³.” This is a strategy that links Economic Development, Education and Employment. The beginning was signaled by Governor Brad Henry’s EDGE project and the creation of the Governor’s Council for Workforce and Economic Development. Why does this impact our system? The Oklahoma Department of Career and Technology Education works closely with these entities at both the state and local levels. If we do not share a common language and are not able to articulate a strategy congruent with the Governor’s vision, we will be excluded from the innovation and development of the new Oklahoma economy and the future funding that will drive these strategies. We can and should use the new Oklahoma CTE strategic plan to drive the innovation we seek. The strategic plan is tied to our system funding and should drive our progress forward.

We must teach skills ahead of the curve to provide a reliable pipeline of workers for Oklahoma’s economy.

Our unique approach to learning must embrace a wider range of career options serving industry’s needs for future workers. We must teach skills ahead of the curve to provide a reliable pipeline of workers for Oklahoma’s

economy. If we base programs on industry-recognized standards and drive the quality of our programs to be officially endorsed and valued by the businesses that hire our graduates, we will be more accountable. It is critical that we continue to evaluate and enhance our student information and finance system infrastructures to encourage our schools to innovate and offer a more flexible delivery of unique career pathways and course combinations.

Leverage Our Strengths to Lead Educational Reform for Every Learner

CTE is poised to provide energy and expertise to help revolutionize the way we look at high school and adult education. We know from research that the highest performing high schools in the U.S. have a career focus and reinforce math, science and reading concepts in the context of the career. The most

effective teaching strategies require rigor, relevance and relationships. CTE can be an important answer to keeping students in school until graduation, preparing students to require less remediation in college and improving the literacy level of high school students and adults. This can be done only if we are bold in focusing our vision and have the courage to expect all CTE programs to perform and meet the expectations of industry, for today and for tomorrow. This vision will require in-depth professional development for teachers, counselors and administrators, utilizing current research-based practices that yield proven results for student learning.

We can offer students a remarkable educational experience that has high expectations; applies reading, mathematics and science concepts in a real-world context; and is delivered according to national industry standards. Research tells us that high performing schools provide a rigorous and relevant education to both adults and high school students. We must teach our instructors methods for teaching technical literacy effectively so that our students leave CTE programs ready to read and compute, use the language of their technical field, and ready to continue learning.

Leverage the Building Blocks of CTE Delivery, Instructional Materials and Assessment

CTE state program administrators and classroom teachers must have a shared vision and knowledge base that effectively uses the Career Clusters knowledge and skills. Once Cluster-specific implementation strategies are developed, it will be important to review existing state curriculum. We must work with targeted business and industry experts to identify national curriculum that will meet industry standards to broaden and deepen the knowledge and skills within each Cluster. In addition, the current system of testing/assessment must continue to embrace state competency tests, third-party testing, and state and national certifications to recognize students for their accomplishments and to provide an industry-endorsed indicator of competency. Professional development must be focused toward these building blocks for the next three years for all CTE teachers, counselors and administrators. These efforts should be undertaken in partnership with the Governor’s Council for Workforce and Economic Development.

What Needs to Be Done?

Use Career Clusters to Connect With Continued Learning

As an example of change in CTE, seven technology centers have moved quickly to embrace the Pre-Engineering pathway within the Science, Technology, Engineering and Mathematics Cluster. Some say this is not our mission; it is said that Pre-Engineering is not “occupational.” However, an increase in enrollment and interest by partnering high schools, colleges, universities and employers indicates a different opinion.

Courses and career academies in geospatial technology, biotechnology, value-added and precision agriculture and nanotechnologies are natural next

steps for CTE. Career Clusters are viable tools to provide a connecting framework and common language that allow economic development, education, workforce development and business to embrace change and energize our vision. Career Clusters also provide unprecedented flexibility by combining knowledge and skills in unique

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ways to quickly respond to industry needs. We have already done this with short-term training and must aspire to build expectations and a clear roadmap for continued learning. In the new world of rapid change, foundation knowledge and skills must be taught not only for today’s economy but also for the anticipated economy.

Continued learning is critical to assist the growth of Oklahoma’s economic health. According to Carnevale and Desrochers (*Standards for What, 2003*), 83 percent of workers with associate degrees earn the same as workers with bachelor’s degrees. According to the 2003 National Assessment of Vocational Education (NAVE), women with postsecondary CTE certificates earn 16 percent more than high school graduates and those earning a CTE-related associate degree earn 47 percent more.

Use Career Clusters to Connect With Business and Industry

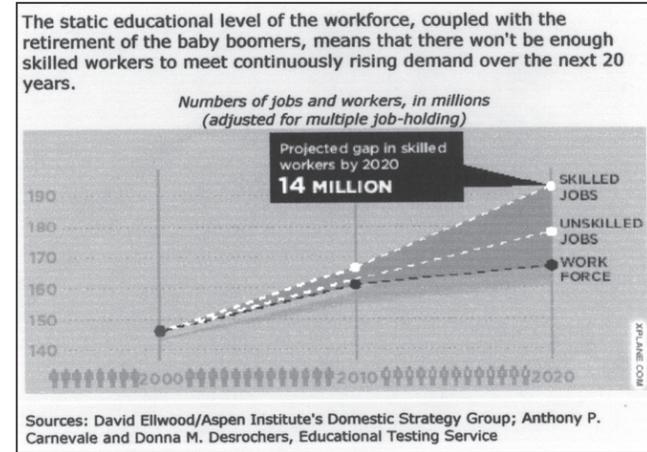
CTE professionals must interact with business in a more intentional and frequent way than ever before. Employers must be invited into the depths of our curriculum at the high school as well as the technology center and skills center. Employers must also provide advice concerning the value of credentials and endorse the credentials we offer. If they do not value our current credentials, we must adopt those that are valued and disinvest in those that do not matter to business.

CTE can be an exemplary educational entity that offers variety, quality, customization, convenience, consistency, speed, continuous innovation and social responsibility in high-demand careers. We can improve our acumen by structuring experiences for students that apply advanced academic skills, technical skills and workplace-readiness instruction because these are the new skills required for success in a knowledge-based economy.

EMBRACING the Challenge

A Shared Vision

Why Career and Technology Education Is Being Impacted by Change



Source: “Grow Faster Together or Grow Slowly Apart,” a report of the Aspen Institute Domestic Strategy Group in Washington, D.C. (2002).

The National Commission on the High School Senior Year in its report, *The Lost Opportunity of the Senior Year*, indicates that the proportion of professional jobs is about the same as 50 years ago (about 20 percent), although the proportion of skilled jobs has nearly tripled. The report states, “For democracy to flourish in this new age, all Americans must possess high levels of literacy and logic with the capacity to think critically.” This means that everyone will need to be comfortable with the scientific method, quantitative tools and technology.

According to Betsy Brand in *Rigor and Relevance: A New Vision for Career and Technical Education*, changes in the economy, work and society demand

that every high school student be prepared—both for careers and postsecondary education. The past division between preparation for college and preparation for work has become a false dichotomy. Rigor and relevance are the necessary elements to create meaningful learning experiences and to motivate today’s students to learn the content needed for tomorrow’s economy.

Dr. Daggett depicts a “rigor and relevance framework for teaching curriculum” (Figure 1) that is based on Bloom’s Knowledge Taxonomy and Application Model.

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Betsy Brand
Rigor and Relevance: A New Vision for Career and Technical Education

CTE is in an excellent position to embrace this model to effectively teach skills needed for the new economy. We must consistently teach in the “D Quadrant” of the graphic below to propel CTE as the new century model for learning. In states where the content of academic and CTE tests has been reviewed, 62 percent of the questions reside at levels 1-2 on both the knowledge and application taxonomies. It is crucial that CTE integrate into the curriculum the application of knowledge and analysis of the application to consistently deliver instruction at that “D Quadrant” (levels 4-5).

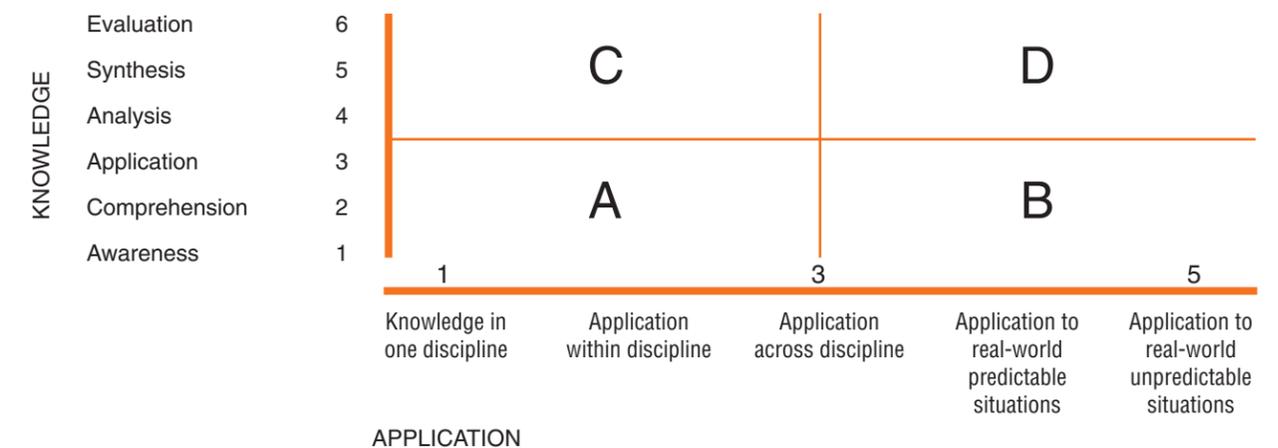


Figure 1. Rigor and Relevance Framework
Source: Dr. Willard Daggett, International Center for Leadership in Education

Why Career and Technology Education Is Being Impacted by Change

Career and Technology Education Is Changing

Many still see the Oklahoma CTE system as “vo-tech.” Often, the recruitment strategies and program titles traditionally used are not attractive to today’s students, parents and employers. In order for the CTE system to manage change efficiently, we must master use of the Career Cluster framework as a tool to clearly and uniformly connect programs to industry clusters for postsecondary education/ economic development and to guide the delivery of our course and program content. If we master this fluid system, we will quickly be a preferred system of choice for all students and a conduit for high-wage, vibrant, future-oriented careers. We must be the system that economic developers will look to first for innovation and results.

The challenge for the Oklahoma CTE system is to create more career entrepreneurs who can be

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high-skill, high-wage employees who know how to combine skills to navigate the new economy. CTE must look to the future and develop sound strategies that will prepare Oklahoma students for tomorrow’s leading-edge industries and emerging careers. We must examine our current programs and courses on the basis of their contribution to regional and state wealth creation grounded in current research regarding self-sustainable wages for regions of our state. A concerted effort must be made to build on new and existing relationships to strengthen our system and to become the conduit for technical training, offering seamless pathways to degrees and high-skill, high-wage careers.

Students entering the workforce at minimum wage must have the knowledge and skills that enable them to quickly add to these basic work-ready skills within the myriad of career ladders and lattices in an industry cluster and continue to grow in industry credentials, salaries and wages.

What Needs to Be Done?

For Oklahoma’s Career and Technology Education (CTE) system to thrive, we must link with other entities and look at career pathways. Pathways that provide additional education and career advancement are critical to the preparation of the workforce and for the future of CTE.

Use Career Clusters for Making the Critical Career Connections

The National Governor’s Association has stated that CTE in the U.S. spends too much time talking about the need for today’s skills and not enough time delivering the skills we know are critical for tomorrow. The business and industry representatives on Oklahoma CTE’s Business Advisory Committee recently stated that it is no longer sufficient to prepare future employees with only certifications and job placements. Our system must now provide workplace readiness skills such as teamwork, communications, literacy and use of calculations. We must also provide career-appropriate academic skills as well as a clear option to move to a degree through identified pathways

of knowledge and skills progression. We must move from teaching occupational skills exclusively to teaching skills and knowledge encompassing foundations for future career flexibility and continued learning.

By organizing the knowledge and skills demanded by business into Career Clusters and pathways and by connecting K-12, career and technology education, and higher education to careers and industry clusters, it will be easier for our business and higher education partners, parents and students to understand the crucial role CTE plays in creating lifelong opportunities for today’s students. These pathways must have a component that applies academic content in a realistic manner as well as a clearly identified link with college and postsecondary education. These pathways must provide avenues for learners to acquire increasingly more sophisticated credentials recognized by business and industry to meet the requirements of the new workplace basics of technical, academic and “soft” skills.

What Needs to Be Done?

Our CTE career guidance efforts must be refocused on individualized planning, pathway navigation and transition services with less emphasis on recruiting for current programs as a primary function. If we are truly providing individualized and effective student services and assuring we have students in the right courses to attain their career plans, then recruitment efforts will be answered by satisfied parents, students and employers. We must focus guidance and counseling on advising students to select pathways for the best career outcome and provide support for students to attain academic skills as well as technical proficiency and links to lifelong learning options. The National Commission on the High School Senior Year, *The Lost Opportunity of the Senior Year*, stressed the critical importance of a written, formal learning plan for each student. The learning plan would outline what the student hopes to accomplish in young adulthood with the education, work and service experiences that can best help the student attain these goals.

Use Career Clusters to Connect With Emerging and Existing Industries

Using the Career Cluster framework, we will provide a technical workforce for new and emerging

industries such as biotechnology, precision agriculture, information technology and merging technologies such as mechatronics. These industries are transforming Career Clusters such as Transportation, Distribution and Logistics and pathways such as Equipment and Vehicle Maintenance. Foundation knowledge and skills that are transferable will help employees bridge current jobs to those emerging that we cannot name today.

Using the Career Cluster framework, we will also refresh and renew existing CTE programs that have skillfully served existing industries for years. Existing programs will now have a tool to *connect* “the depth of the occupational knowledge and skills traditionally provided” to:

- the breadth of all aspects of the industry, and
- the related academic and employability knowledge and skills.

CTE programs can make these connections by identifying linkages within program instruction. CTE programs can also partner with middle school courses, 9th-10th grade courses, academic faculty, career development processes and postsecondary institutions to develop rigorous and relevant sequences of courses.

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Career and Technology Education of the Past	Career and Technology Education of the Future
Technical Skills Training in isolation	Technical Career Preparation supported by rigorous academic and employability skills
Technical Skills Training in depth for one job	Career Preparation (in depth and in breadth) for lifelong career mobility and advancement
Education/Career Preparation for those who can’t make it in college	Education/Career Preparation of choice for the diversity of all students
Program-focused, instruction-centered, compliance-driven	Industry-focused, student-centered, and performance-driven
Traditional focus on today’s entry-level job preparation	Customized packaging of instruction into sequences of courses blending with science and math applications, creating new pathways for career advancement and continuing education for both emerging and existing careers over the lifespan