

**THE CONVERGENCE IMPERATIVE:
UNIFYING ACADEMICS AND
CAREER AND TECHNICAL EDUCATION**

AUGUST 2012



CTE | Technical
Assistance
Center of NY

1585 Rt. 146
Rexford, NY 12148
518-723-2137
Fax: 518-723-2140

ctetac@spnet.us

CTE Technical Assistance Center of New York: Mission and Purpose

The Career and Technical Education Technical Assistance Center (CTE TAC) of New York assists the New York State Education Department (NYSED) in carrying out its mission of improving the quality, access, and delivery of Career and Technical Education (CTE) through research-based methods and strategies resulting in broader CTE opportunities for all students.

The CTE TAC operates as part of the Successful Practices Network (SPN) under a contract with the NYSED. The CTE TAC increases the capacity of the NYSED to serve, support, and expand CTE across the state.

CTE TAC services are provided to teachers and students in:

- Local education agencies
- BOCES
- High needs school districts
- CTE professional organizations
- CTE student leadership organizations

CTE TAC Work Plan

- CTE data collection and communications
- Networking to strengthen CTE
- Integration of the Common Core State Standards
- CTE program and student leadership expansion
- CTE program approval process
- Best practices in CTE

The Career and Technical Education Technical Assistance Center of NY has made every effort to ensure the accuracy and reliability of the information contained in this white paper. The views expressed are theirs alone and do not necessarily represent the position of the NYS Board of Regents or the NYS Department of Education.

The Convergence Imperative: Unifying Academics and Career and Technical Education

*The evolution of **convergence** nationwide and worldwide has prompted education leaders to once again address the persistent gaps and inconsistencies in education. The downward spiral of the achievement levels of U.S. students continues. If the United States is to maintain its prominence in the global marketplace, a convergence of rigorous academic and relevant career and technical education (CTE) skills required by business and industry needs to manifest itself in new ways.*

Teaching for both academic rigor and CTE relevance is a win/win experience for all education stakeholders. The resulting convergence helps students improve their performance and assists in the transition to postsecondary education and careers. However, while model CTE programs are already embracing their role in delivering academic skills and knowledge, academic programs have been slower to embrace career-technical learning to improve student achievement.

*The Career and Technical Education Technical Assistance Center (CTE TAC) of New York calls upon CTE and academic leadership to step forward and seize the school-improvement potential of a convergent curriculum. By so doing, education leaders can help achieve the New York Board of Regents' goal of enhancing student achievement at **all** levels. At the crossroads of the implementation of the Common Core State Standards (CCSS) and Next Generation Assessments, CTE contributes a rich and valuable vehicle to develop college and career readiness.*

Global Connectivity Is the New Norm

Convergence is real. The 21st century global community and the nationwide and worldwide trend toward connectivity require strong academic and technical knowledge and skill. One does not have to look far to see scientific, societal, political, and economic trends that point to increasing convergence. For example:

- **National economies are converging into one global economy.** Economies on every continent lean more heavily on international markets for survival and growth. Emerging economies such as China, India, and Brazil are projected to grow significantly as they look to other economies as markets for products and services. The European financial crisis, for example, impacts not only global imports and exports, but also the economic stability of countries an ocean away. The U.S. stock market can rise or fall with changes in Greece's national debt. Each country builds its own GNP only by recognizing the realities of global economic and financial interdependency.
- **Diverse communication technologies are converging into digital "appliances."** Communications technologies are converging at an unprecedented pace. Digital hand-held appliances now provide many of the same functions that only a decade ago were performed only by separate stand-alone tools such as telephones, laptop and desktop computers, clocks and watches, video game consoles, FAX machines, pocket planners, and even cameras.

Moreover, the ability to communicate with almost anyone, anywhere, anytime — and at the speed of light — has become the norm. Connectivity is "converging" societies, institutions, organizations, relationships and, yes, people.

Education Is *Not* Converging

By comparison, there has been less "convergence" in public education. While the world outside of school has changed dramatically, education often seems to be averse to change. The impending launch of the Common Core State Standards (CCSS) and Next Generation Assessments stand out as an encouraging sign of bringing closer

together at least one aspect of education — that of creating connections between college and career readiness. However, gaps in education still abound and purposeful alignment remains the exception. Conversations about forging connections between academic and CTE occur every day, but few meaningful, sustainable, and productive changes occur.

Gaps and disconnects remain.

- At-risk populations continue to lag in achieving proficiency goals.
- The funding crisis in education has widened the gap between have and have-not districts and schools. The long-lamented achievement gap remains also an opportunity gap.
- Many are questioning the cost and return on investment of a bachelor’s degree. A study conducted by PayScale for *Bloomberg BusinessWeek* suggests that the ROI of a four-year college degree may be highly overstated, with value depending greatly on the school attended. Across all schools surveyed, only 17 reported that graduates would be able to recover the cost of their education and out-earn a high school graduate by \$1.2 million in their working years. For most other schools, the ROI “gap” — not to mention college debt — is much greater.
(http://www.businessweek.com/interactive_reports/bs_collegeROI_0621.html)
- Although many U.S. employers are frustrated by a shortage of career-ready applicants with in-demand technical skills, education pathways leading to two-year degrees, industry certifications, apprenticeships, and other postsecondary credentials are still considered second-best by many administrators, guidance counselors, students and their parents.
- Academic/general education and CTE are still taught as separate programs of study in the vast majority of U.S. high schools. Although learning for most students needs to be both rigorous AND relevant; and although far too many of today’s students are disengaged from their classroom learning, little has changed in curriculum and program structures since the 1950s.

This ongoing disconnect — between academic education and CTE — is both inefficient and ineffective, but is also readily addressable. The impetus being provided by the CCSS promotes curriculums that focus equally on college and career readiness. Yet many states appear to be missing this opportunity to bring greater convergence to their standards and curriculums. In fact, only approximately half of the states that have adopted CCSS even have CTE representation on their CCSS implementation teams, despite the obvious advantages of CTE leaders taking a more active role. (Meeder, et al., 2012)

Why Focus on Academic and CTE Convergence?

If the national conversation and public policy are ever to reshape the vision of college and career readiness, it is now.

- Since 2008, high unemployment and higher underemployment rates are highlighting mismatches between the skills that graduates have and skills and training that employers want.
- America’s economic competitiveness is in decline. America has lost much of the manufacturing industry that kept it the leader among global exporters. The United States has the highest unemployment rate since 1983. Students are not challenged and empowered by world-class education standards and yet both high school and college graduates often lack the requisite skills to be successful in entry-level jobs. Business and industry are losing confidence in the American education system.

The CTE TAC of New York influences policy and practices to bridge the divide in delivering academic concepts and CTE applications by offering guidance on creating a new vision of “inter-connectedness” between academics and CTE.

Decades of Reform Have Only Perpetuated the Status Quo

Studies and initiatives released over several decades have provided clear warnings that were designed to bring about changes in public education:

- 1983: *A Nation at Risk* warned that students were under-prepared for the future.
- 1991: *Secretary's Commission on Achieving Necessary Skills (SCANS)* was created when the Secretary of Labor convened a panel to identify the essential knowledge and skills required for all entry-level workers. The resulting report outlined industry expectations of graduates and listed critical "generic" competencies that should be taught in U.S. education programs.
- 1994: *Goals 2000: Educate America Act*. In 1989, President George H.W. Bush and 50 governors announced six education goals for the nation. Following the governors' lead under the Clinton Administration, the legislation was passed in 1994.
- 2002: *No Child Left Behind Act of 2001 (NCLB)*. The re-authorization of the 1965 ESEA, titled NCLB, was designed to create school accountability for measurable student achievement and addressing performance gaps.
- 2006: *Carl D. Perkins Career and Technical Education Improvement Act*. Consistent with NCLB, Congress sought increased accountability for CTE students' academic achievement and encouraged the concept of career pathways as a means to provide rigorous academics for students in CTE programs. Perkins' reauthorization in 2012 was in keeping with the spirit of integration of college and career preparation.

Despite *all* the evidence that public education needs re-thinking and improvement, too few education leaders have heeded that cry. Despite evidence that most students would benefit from pursuing a career pathway program of studies through secondary into postsecondary education, the public image of CTE as "OK for other peoples' kids" remains entrenched. In addition, many academic programs focus on teaching content and not on developing transferable abilities to apply knowledge. CTE programs often focus only on technical skills and not on academic college-preparedness.

In its continuing analysis of the nation's highest performing and most rapidly improving schools, the International Center for Leadership in Education has found that the distinction between where academics and CTE begin and end is truly blurred. Students in these schools tend to perform at higher levels on high-stakes tests and can use and apply knowledge to solve challenging problems with unpredictable solutions.

Finally, what "career and technical education" is called apparently has little impact on existing biases and preconceptions. Over several decades, labels have changed to reflect more emphasis on the application of higher level academic skills and knowledge — from vocational education to occupational education to CTE. In spite of name changes, too many CTE programs generally remain isolated from academic education. The mindset that CTE is for students who cannot succeed academically is perpetuated by policies and practices across the country.

In short, little has changed, and yet, the world for which these programs prepare young people has changed dramatically.

New Initiatives, New Opportunities

The new CCSS and Next Generation Assessments offer both academic and CTE educators opportunities to provide students with enhanced - and more "convergent"- rigorous *and* relevant learning. CTE can become an integral partner in strengthening core literacy and mathematics skills across all disciplines. According to Meeder, et al. (2012), the opportunity for both greater convergence and a leadership role for CTE is now:

Because of the significant changes to ELA and math expectations, CTE educators are beginning to view the CCSS as an opportunity to build upon the foundational work called for in the Perkins Act. In particular, many state CTE directors and local administrators actively are establishing CTE as an integral partner in strengthening core literacy and math skills, while continuing to play a valuable role in fostering student career aspirations and providing practical career preparation for high school-age youths. While some states and districts have already embraced the implementation of the CCSS as an opportunity to better integrate academic and technical knowledge and skills in their K-12 systems, many others have yet to take on this challenge and are focusing more intently on implementing the CCSS in the core academic areas at this time. (p. 6)

Benefits of Academic and CTE Convergence to General Education, CTE, and America’s Future

To effectively meet the needs of 21st century learners effectively and also address an increasingly challenging labor market, academic and CTE convergence provides students with the knowledge, skills, and credentials to achieve success. But new pathways are needed to achieve that goal.

Many of the best high schools in America are creating stronger blueprints for success through the use of career and technical education (CTE) concepts and applications: model CTE programs are already embracing their role in delivering academic skills and knowledge; likewise model academic high schools are already embracing traditional CTE program components to improve student achievement

Tim Ott, President & CEO
Successful Practices Network

1. With thoughtful pathways and postsecondary linkages to apprenticeships, certificate programs, the military, corporate training, and 2 and 4-year colleges, CTE can help put people into - as well as back to - work in high-wage, high-demand occupations.
2. A growing body of evidence suggests that the engaging learning provided in CTE courses can result in higher graduation rates; greater academic success and access to postsecondary experiences in college, apprenticeships, and business and industry training; and increased earning power (Stone, 2011; Bishop and Mane, 2004; Pathways to Prosperity, 2011). Helping education leaders to understand the positive impact that CTE programs can have on student success is imperative.
3. CTE provides students with the relevance that is so often lacking in academic classrooms. CTE educators can uncover rigorous academic standards embedded in their course content to enhance both academic and CTE achievement.
4. The human brain processes information by making connections, so when academic and CTE content are integrated, the brain more readily retains that information. (Caine, R.N. and Caine, G., 1991) Students will achieve at higher levels when knowledge and skills are relevant, applied, and interconnected.
5. Both knowledge and skills are converging in the 21st century. The National Research Council’s *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century* (2012) reports that 21st century competencies will require deeper learning i.e., the process of learning for transfer. “Transference” enables an individual to take what was learned in one situation and apply it to new situations — both content knowledge and procedural knowledge.
6. Postsecondary learning for its own sake should not be the goal, but rather how to help students make successful transitions to adult life and careers by completing college, not just attending college. (Pathways to Prosperity, 2011)
7. All educators need to be ever-mindful of the fact that, “CTE provides a context for improving the rigor of knowledge and skills in public education; but it also provides opportunities for students in all segments of the population to explore their interests and successfully transition to postsecondary education [and careers].” (International Center for Leadership in Education, 2011, p. 22)

Barriers to Academic and CTE Convergence

Barriers to successful academic and CTE convergence are many. Within a school or school system, they can be related to organizational and instructional leadership as well as to teaching — and can be examined through the lens of the International Center for Leadership in Education’s Daggett System for Effective Instruction (DSEI). See <http://www.leadered.com/dsei.html>

Organization Leadership

- The academic community, parents, students, and the community at large often misunderstand CTE. They do not see the impact it can make across the entire curriculum in engaging students and raising student achievement, especially when CTE courses incorporate academic rigor.
- District and school leadership often does not fully understand the transition New York State has made from vocational education to CTE and the more recent mandates to integrate the CCSS into CTE programs.
- Many educators fail to see the potential of convergence because organizational structures do not encourage active and collaborative relationships among CTE leadership and school and district organizational and instructional leadership.
- CTE educator professional organizations are loosely associated. Although excellent national and state groups such as ACTE, NTYSACTE, and ACTEA provide advocacy for all of CTE, program-specific educator professional organizations have historically focused their marketing efforts primarily on their own career areas, which diffuses advocacy for CTE as a whole.
- While the intent of the CTE program review/approval/re-approval process is sound, the burden to gain approval is placed on individual CTE programs, which often have limited staff to carry out this time and resource-consuming process.
- Districts, BOCES, and high schools can be frustrated by the lack of existing models and exemplars of convergence-based programs.
- The fiscal restraints facing schools and a misunderstanding of the value of CTE in school improvement have placed many existing CTE programs at risk. Facing such challenges, many CTE educators and leaders may be — unfortunately and perhaps shortsightedly — unwilling to change or expand existing programs to embrace convergence.

Instructional Leadership

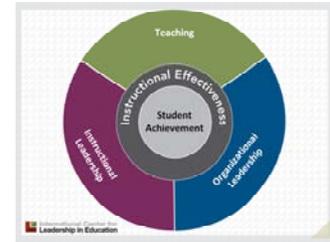
- Academic teachers and principals often value BOCES as a convenient and efficient way to provide students with CTE options. Yet comprehensive high schools are by their nature logical venues for “convergent” innovations such as career academies, early college programs, and others. Physically separating the locations for delivery of academic and CTE programs may impede convergence initiatives.
- “High-quality teacher” requirements also can provide a challenge. CTE educators, unless dual certified in their technical area and an academic area, cannot assume full responsibility for teaching an academic subject.
- “Most CTE certification programs do not have academic-focused course or competency-based requirements.” (Meeder, et al., 2012, p. 23)

Teaching

- CTE teachers often view themselves as teaching only technical skills and perceive core academics as the domain of academics teachers. This perception works against the implementation of the CCSS and convergence.
- Teacher unions, core subject teachers, department chairs, etc., are frequently ambivalent about integrated academics and the convergence of CTE and academics.
- English language arts, mathematics, and science teachers typically have limited experience enhancing their subject through horizontal alignment with other content areas, including CTE.
- CTE teachers typically have limited experience with the focused integration of English, math, and science into their CTE content areas.
- CTE teachers may not view instruction in English, math, and science as a step toward greater student success in CTE.

Opportunities for Convergence through Organizational Leadership, Instructional Leadership, and Teaching

Where there are barriers, there are also opportunities. The Daggett System for Effective Instruction (DSEI) can serve as a unifying framework to help state, district, and school leadership build, maintain, and enhance the convergence process.



The DSEI model is based on the premise that an aligned and coordinated focus on all three levels of the education organization (**Organizational Leadership, Instructional Leadership, and Teaching**) is required to make convergence sustainable and scalable for student achievement across an entire education system. The elements within each of the three domains can be used to help educators devise and plan strategies that will lead to academic and CTE convergence.

<p style="text-align: center;">Elements of Organizational Leadership</p> <ul style="list-style-type: none"> ✓ Create a culture of high expectations ✓ Create a shared vision ✓ Build leadership capacity ✓ Align organizational structures and systems to vision ✓ Align teacher/administrator selection, support, and evaluation ✓ Support decision making with data systems
<p style="text-align: center;">Elements of Instructional Leadership</p> <ul style="list-style-type: none"> ✓ Use research to establish urgency for higher expectations ✓ Align curriculum to standards ✓ Integrate literacy and math across all content areas ✓ Facilitate data-driven decision making to inform instruction ✓ Provide opportunities for focused professional collaboration and growth
<p style="text-align: center;">Elements of Teaching</p> <ul style="list-style-type: none"> ✓ Embrace rigorous and relevant expectations for all students ✓ Build strong relationships with students ✓ Possess depth of content knowledge and make it relevant to students ✓ Facilitate rigorous and relevant instruction based on how students learn ✓ Demonstrate expertise in use of instructional strategies, technology, and best practices ✓ Use assessments to guide and differentiate instruction

Organizational Leadership

- Develop a common vision of “college and career ready.” Many New York State school leaders may understand the college-ready concept, but need to reflect on what “career-readiness” means. A coherent single definition of “college and career ready” would assist districts and schools in developing a culture and set of expectations leading to a vision consistent with the goal. The CTE TAC of New York provides the following definition for reflection and consideration:

To become college and career ready, students in New York should have preparation in *three major skill areas*: core academic skills, employability skills, and technical, job specific skills, which allow them to transition seamlessly to an entry level position and/or a postsecondary credentialing program (e.g., apprenticeship, licensure, community, or college). In order to make this happen students should:

- develop individual college and career plans with academic core requirements and course choices appropriate to their plans
- explore and understand the academic and skill requirements for their selected career cluster

- possess the specific academic skills appropriate for, and which are foundational to, the career they wish to pursue
- be able to apply academic skills to situations in an increasingly sophisticated workplace and society

- Raise the perceived value of the technical endorsement on the Regents diploma and diploma with advance designation with core content administrators, coordinators and teachers, colleges, apprentice programs, and the business community. Including this information on school report cards would be a positive step in signaling the importance of this enhanced diploma and would serve the dual purpose of indicating the number of students who have passed a technical assessment. When information on CTE participation and results is made transparent, there is a significant opportunity to improve the profile and importance of CTE.
- Take advantage of the changes in graduation requirements proposed by the Board of Regents with the potential for greater flexibility in meeting academic requirements through rigorous CTE programs and substitution of a technical assessment for a Regents examination.
- Strengthen the knowledge base of administrators who may become CTE leaders. This is an important but neglected effort. Potential administrative leaders should be tapped from among CTE teacher leaders and leaders of CTE professional associations. In addition, information about the relevance of CTE programs should be included in all leadership programs.
- Create career pathways in which an articulated sequence of rigorous academic and CTE courses leads to a two- or four-year degree or a certificate/license that is recognized by business and industry. These pathways meet all academic standards and testing requirements, as well as postsecondary entry requirements. Students get a head start in learning foundation knowledge and industry-recognized skills in their chosen career fields and may be able to earn college credit through dual enrollment or articulation agreements. A collaboration among Harvard University's Pathways to Prosperity Project, Jobs for the Future, and six states has begun to build career pathways systems for high school students by deeply engaging both educators and employers.
- Build STEM education to reinforce today's high-tech, high-skill global economy. STEM students engage in activities, projects, and problem-based learning, which provide them with a foundation and path to college and career success, along with mentorships and workplace experiences. The Project Lead The Way (PLTW) and Engineering by Design curriculums in middle and high schools are founded in the fundamental problem-solving and critical-thinking skills taught in traditional CTE, while integrating academic and technical learning standards and STEM principles.
- Use the CTE Program Approval Process developed by the NYSED (New York State Career and Technical Education, Board of Regents, 2001) to encourage and support the transition in CTE programs. NYSED uses this process to ensure the quality of local CTE programs in meeting the needs of all students. The CTE TAC of New York recommends that more schools use this process as a way to expand opportunities for students to be college *and* career ready when receiving a high school diploma, thereby helping to achieve the Board of Regents' goal of enhancing student achievement at all levels. The process is currently being used by the CTE TAC of New York to drive reform efforts in selected schools across the state.

U.S. Secretary of Education Arne Duncan calls STEM one of the "great models of the new CTE succeeding all across the country."

Instructional Leadership

- Provide tools and professional development to assist CTE teachers to enhance their instructional focus on English language arts, mathematics, and science.
- Ensure that any CCSS and Next Generation Assessments planning includes cross-disciplinary teams of both academic and CTE teachers.
- Provide information and training on CCSS curriculum mapping strategies/tools and lesson planning, as well as the time to complete them. Provide methods to crosswalk current standards to the CCSS.

- Help CTE educators acquire the skill sets to develop student learning and performance tasks (formative and summative) at the level that will be required in New York State’s new assessment program and also in compliance with the NYSED guidance on Student Learning Objectives (SLOs).
- Seek Smaller Learning Communities (SLC) program awards, i.e., federal discretionary grants to local education agencies support the implementation or expansion of SLCs and activities to improve student academic achievement in large public high schools. Improvements in curriculum and instruction include structures such as freshman academies, multi-grade academies organized around career interests or other themes, "houses" in which small groups of students remain together throughout high school, and autonomous schools-within-a-school, all of which are conducive to academic and CTE convergence.
- Foster CTE and academic collaboration by helping both CTE teachers and academic teachers to take leadership positions in developing professional learning communities. These communities can help all teachers to unite around common goals, sustain a passion for teaching, and co-promote instructional excellence among peers.

Teaching

- Investigate opportunities for shared instruction and planning with peers across the academic-CTE “divide.”
- Use and encourage other teachers to use a “flipped classroom” approach, one in which teachers become learning facilitators, coaches, and tutors rather than presenters of content. “Let the students work while the teacher observes, instead of vice versa. “
- Employ more technology, project-based learning, and student collaboration to deliver academic skills and knowledge.
- Identify and cultivate professional relationships and collaborations with administrators, peers, and mentors who are receptive to greater convergence.
- Become aware of academic standards that readily lend themselves to incorporation and integration into CTE programs. Encourage academic teachers to apply relevant career competencies that can engage students in core classes.

CTE’s Convergence Imperative

Public education and the opportunity for convergence as a driver of school improvement are at a crossroads. While connectivity is sweeping the globe, convergence in academics and CTE is stalled, at the same time education leadership is struggling to provide students with the skills and knowledge for success in a global, ever-changing, high-tech economy. More of the same-old same-old will not suffice. Convergence between academic and CTE learning is a powerful, innovative tool to transform education for the future well-being of students, the U.S. economy, and the nation as a whole.

Relevance (CTE) makes rigor (academics) possible.

To this end, the CTE TAC of New York is influencing state and local policy and practices that promote innovative and transformative directions such as convergence. Its goal is to implement a new definition of college and career readiness, which is especially timely because the new standards and assessments are facilitating — and necessitating — convergence. The vision is to support *all* students in acquiring the rigorous knowledge and relevant skills needed to succeed as productive citizens in a global economy.

The NYSED Office of Career and Technical Education and the CTE TAC of New York are actively working to provide more information, research, advocacy, and professional development to CTE and academic educators through concerted and dedicated leadership and stewardship, forethought at the policy and program levels, and education for decision makers about the power of CTE for school improvement and student success. As a result, they are helping all educators to capitalize on intersecting forces and strategies that can dramatically impact a student’s achievement and future success.

The CTE TAC of New York welcomes the opportunity to assist all educators in this endeavor. Please use the contact information on the cover.

References

- Bishop, J. and Mane, F. (August 2004). [The Impacts of Career-Technical Education on High School Labor Market Success](#), *Economics of Education Review*, Vol. 23, Issue 4.
- Bloomberg Businessweek. *What's Your College Degree Worth?* Retrieved from http://www.businessweek.com/interactive_reports/bs_collegeROI_0621.html
- Brand, B. (May 2008). Supporting High Quality Career and Technical Education through Federal and State Policy. American Youth Policy Forum. Retrieved from <http://www.aypf.org/documents/CTEMeetingPaper.pdf>
- Caine, R. N. and Caine, G. (1991). *Making connections: Teaching and the human brain*. Alexandria, VA: Association for Supervision and Curriculum Development
- Career and Technical Education Technical Assistance Center of New York. (2012). *Challenges to CTE Programming Success in NY State*. Rexford, NY: Career and Technical Education Technical Assistance Center of New York
- Humes, K., Jones, N.A., and Ramirez, R. R. (March 2011) Overview of Race and Hispanic Origin: 2010. Washington, DC: U.S. Census Bureau, U.S. Department of Commerce, Economics and Statistics Administration. Retrieved from <http://www.census.gov/prod/cen2010/briefs/c2010br-02.pdf>
- International Center for Leadership in Education. (2011). *Career and Technical Education for College and Career Readiness — Convergence of Academics and CTE*. Rexford, NY: International Center for Leadership in Education
- International Center for Leadership in Education. Daggett System for Effective Instruction. Retrieved from <http://www.leadered.com/dsei.html>
- Meeder, H., Suddreth, T., the Association for Career and Technical Education, and the National Association of State Directors of Career Technical Education Consortium. (2012). *Common Core State Standards & Career and Technical Education: Bridging the Divide between College and Career Readiness*. Washington, DC: Achieve, Inc.
- National Association of State Directors of Career and Technical Education Consortium. (2010). Up to the Challenge — The Role of Career and Technical Education and 21st Century Skills in College and Career Readiness. Partnership for 21st Century Skills, Association for Career and Technical Education
- National Research Council. (2012). *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century*. Retrieved from http://www7.national-academies.org/bota/Deeper_Learning_Report_Homepage2.html
- New York State Career and Technical Education, Board of Regents. (2001). *Implementation Guide for CTE Program Approval*. Albany, NY: New York State Education Department. Retrieved from www.p12.nysed.gov/cte/ctepolicy/guide.html
- Pathways to Prosperity: Meeting the Challenge of Preparing Americas Youth for the 21st Century*. (February 2011). Cambridge, MA: Harvard Graduate School of Education, Harvard University
- Stone, J. (2011). College and Career Ready: A Conceptual Framework for Increasing Engagement, Achievement and Transition. National Resource Center on Career and Technical Education, unpublished manuscript