

CAREER AND TECHNICAL EDUCATION: A DRIVING FORCE IN SCHOOL IMPROVEMENT

MARCH 2012



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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.

Career and Technical Education: A Driving Force in School Improvement

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.

*The Career and Technical Education Technical Assistance Center (CTE TAC) of New York sheds light on this important trend by outlining 12 characteristics found in America's most successful schools, and then aligning these characteristics to the New York State Education Department (NYSED) CTE Program Approval Process. To help achieve the Board of Regents' goal of enhancing student achievement at all levels, a call is made for a renewed emphasis on defining characteristics that mirror model programs, ensuring that **all** students acquire the rigorous knowledge and skills needed to succeed as productive citizens in a global economy. Both the characteristics and the alignment to the CTE Program Approval Process provide foundation and structure for a CTE pathway to move forward.*

It has become apparent in recent years that most American high schools need some degree of reform, if they are to provide all students with a rigorous and relevant curriculum. This paper lays out 12 defining characteristics of urban, suburban, and rural schools that emerged as common themes in a five-year research study — characteristics that can serve as guides for fostering rigorous, relevant instruction that will provide all students with the knowledge and skills needed for success in today's complex, technologically oriented society. An alignment to the CTE Program Approval process developed by the NYSED presented later in this paper reflects how these defining characteristics are cornerstones of quality CTE program development across the country and in New York State, and as such can serve as a catalyst for efficient, effective implementation of a CTE delivery system.

Defining Characteristics of America's Most Successful High Schools: The Work Behind the Results

With the primary agenda of identifying sustainable, flexible, and powerful solutions to enable *all* students to complete an academically rigorous and relevant curriculum, representatives of the Successful Practices Network, the Council of Chief State School Officers, the International Center for Leadership in Education, and the Bill & Melinda Gates Foundation, sought to expand school quality measurement beyond traditional “state testing requirements” made all too prominent after NCLB was enacted in 2002. The resulting research grant, “Focused on Student Success: A Five-Year Research Study of Models, Networks, and Policies to Support and Sustain Rigor and Relevance for ALL Students” (Lucey, L., Silver, D., Corso, M., and Fox, K., 2009) investigated the critical factors that influenced the improvement on those measures over time. The Quaglia Institute joined this partnership to bring additional research expertise and experience in qualitative data collection and analysis.

Now more than ever, education leaders want proven, practical, and replicable models they can use not only to meet AYP requirements, but also to provide their students — especially those at risk — with the best possible learning environments to prepare them for success in college, the workplace, and adult life. Equally important, they can begin framing how to define multiple measures of school performance and communicate them to their community. The key drivers of this initiative take on an even greater significance as states become more aligned in their standards through the Common Core State Standards and the development of Next Generation, 21st century assessments for them.

The high schools included in the “Focused on Student Success: A Five-Year Research Study of Models, Networks, and Policies to Support and Sustain Rigor and Relevance for ALL Students” have provided great insight into how American high schools can help *all* students complete an academically rigorous and relevant curriculum.

Three questions drove this inquiry:

1. Using multiple measures that are balanced for state levels of proficiency, what factors contributed significantly to success?
2. What common experiences or opportunities exist across the highest performing schools?
3. What replicable cultural factors emerged that impact student performance?

Over time, comparisons to the many good high schools that will need to make further changes to be classified as great (*i.e.*, *all* students receiving a rigorous and relevant education and thereby achieving academic and career-ready success) will be especially insightful. Not surprisingly, many model CTE programs are already leading the way in fostering the characteristics of successful high schools. While there is no one formula for a successful high school, certain characteristics appear to be consistent across the 24 model high schools.

This work has the potential to benefit large numbers of New York State schools, educators, and students through the sharing of models of success that can be adapted for use to fit the needs of schools seeking new practices and structures.

Selection of Schools

A cross-section of 24 successful urban, suburban, and rural schools was selected. They were chosen on the basis of their ability to rise above the singular expectation of high performance on state tests and set an example for others on how to redefine “proficient” for all students. They are schools that, given their socioeconomic characteristics, are exhibiting exemplary academic growth and helping students to raise academic achievement through the use of a rigorous and relevant curriculum. All schools were recommended by state education leaders and national organizations involved in high school reform, including the chief state school officers in ten states, the National Association of Secondary School Principals, High Schools That Work, National Academy Foundation, Project Lead The Way, and the International Center for Leadership in Education. The socioeconomic status of the schools’ populations ranged from low wealth to average wealth. Care was taken to ensure the 24 schools reflected the ethnic diversity of the country. Evidence of hard work, high achievement, dedication, and a commitment to student learning was pervasive in all schools.

Defining Characteristics of America’s Most Successful High Schools: The Results

The researchers found **five key themes** in each of the 24 schools that emerged from the data analysis and were subsequently refined in the qualitative research:

1. **Leadership:** A clear sense of purpose that empowers staff to engage with students, colleagues, and community toward a clear purpose and common vision
2. **High expectations:** For both academic performance and student opportunities for both college and workforce readiness
3. **Relationships:** A school community that explicitly values, nurtures, and develops relationships as an integral part of their successful learning environment
4. **Student opportunities:** Successful schools had a myriad of academic and personal skill development opportunities for students
5. **Professional culture:** Teachers, administration, and staff work consistently collaborate toward goals with a clear focus on continuous improvement, often finding unexpected solutions to complex problems

Twelve defining characteristics of these urban, suburban, and rural schools emerged as common themes and are described as follows. It is important to note that the reviewers who conducted the site visits found evidence of the 12 characteristics in nearly *all* of the 24 schools visited. For each characteristic, an example of how either an academic or a CTE high school among the model schools applies the characteristic to its own situation is included. A strong academic and career emphasis already dominated most of these schools where they are aggressively applying high levels of cognitive knowledge to real-world unpredictable situations relevant to the needs of the 21st century.

A key outcome of the study was that almost all of these schools embodied the key tenets of strong CTE programs.

In its recent white paper on “Recommendations for Developing College and Career Ready Students” (New York State Association for Career and Technical Education, 2012), NYSACTE cites research by the National Longitudinal Study and ConnectED: The California Center for College and Career (Hagen, J., Sun Ho, P., and Hudis, P., 2010), which found that, “Student outcomes improve when CTE programs use a robust integrated curriculum aligning core academics and Career and Technical Education.” (NYSACTE, 2012, p. 7) The study cites **four positive correlations** when CTE programs utilize an integrated curriculum:

- Improved learning: students learned faster and retain concepts better when taught rigorous and relevant academic material in a context of real world application.
- Higher academic achievement: CTE students were found to have increased graduation rates and improved exit exam passing rates than students from the general population.
- Higher wage earning potential: postsecondary students who participated in high school CTE career pathways that combined integrated curriculum with work-based learning achieved higher wages compared to similar students who did not participate in CTE pathway programs.
- Lower dropout rates: risk of dropping out was four times higher when students took no CTE courses than when students completed three such courses for every four academic courses. (NYSACTE, pp. 7-8)

Hence, the following 12 defining characteristics from the study of 24 model schools (Lucey, L., Silver, D., Corso, M., and Fox, K., 2009) can serve as guides for ensuring rigorous, relevant instruction to help CTE programs, as well as all programs, build a strong foundation for success.

1. School Culture

High-performing schools believe that all students can and must achieve high standards. They have a few academic priorities and address them well. In their culture of academic excellence they recognize that NCLB, AYP, and state testing programs create the floor for what all students need to achieve. In other schools, this floor all too often becomes the ceiling: If the students have passed the state tests, they have achieved academic excellence. High-performing schools believe that passing the test is the minimum and is far from the definition of academic excellence. The tests are a point of departure, not the finish line.

The highly successful schools take the time upfront to create a clear understanding among students, parents, faculty, and the general public as to *why* high standards are essential for all students. Jobs for the unskilled are disappearing in this country. The human and economic consequences to individual students who have not mastered and are unable to apply rigorous academic standards in the society they live in are too severe for this nation to ignore. This message is reinforced constantly and leads to a passion in educators that all students must meet high standards. Since CTE programs tend to have stronger ties to business and industry than academic schools, this characteristic is particularly relevant to model CTE programs.

Simply obtaining admission to college — where a large percentage of students begin by taking remedial courses — is *not* a definition of excellence.

In addition, these educators believe that all students can learn, but they recognize that a wide variety of delivery and support systems must be put in place to enable students to achieve their potential. Given the support structures, they believe that students will achieve high standards.

To create a culture for success that improves student performance, the mission must be *the* driving factor in all that is said, done, and believed in the school and classroom. Without a clear and focused direction and a belief system to back up that direction, long-term improvement that is sustainable simply will not happen. The values we implement related to our students form the structure that determines success or failure. If we have a well-articulated set of beliefs about young people yet do not consciously create a structure, policies, etc., that support these beliefs, success will be fleeting at best.

Total Cultural Transformation at Zebra New Tech High School

Rochester, Indiana

600 students, grades 9-12

In the past decade, the Rochester School Community Corporation faced many challenges, including a declining graduation rate, an unacceptable dropout rate, lower scores on standardized tests, students not engaged in their learning, and graduating students not prepared for success at work or in college. After an extensive needs assessment and examination of school reform models by a school and community task force, Rochester decided the New Tech model best suited its school, community, and student needs. Rochester High School is now breaking new ground as it transforms a traditional high school to Zebra New Tech High School. *Rochester was the first small rural school in the nation to undertake this bold whole school transformation.* As a result, the culture of the school has been transformed. Administrators collaborate at all levels to provide the resources and programs necessary for student success. Teachers collaborate with students to create a culture of trust and responsibility. Relevance, rigor, and respect have become a part of all New Tech classes. The school has become student-centered, with an emphasis on meeting the individual needs of students.

2. Foundation Learning

Achievement in the core subjects of English language arts, math science, and other areas identified by the school make up foundation learning. This characteristic looks at indicators of the school's fundamental academic strengths as measured by state tests, additional assessment results, graduation requirements, etc.

Note: Foundation Learning is the first of four dimensions that comprise the International Center's Learning Criteria to Support 21st Century Learners™. Working with a dozen national education groups representing many constituencies, the International Center's Learning Criteria is a comprehensive set of criteria to help schools turn their beliefs about education, students, and learning into priorities for school improvement by looking at the whole school and the whole student. Every school has its own unique situation, strengths, challenges, goals, personnel, leadership, demographics, history, and other variables. This makes up the school's DNA. School leaders use the Learning Criteria and the school's DNA to determine its success in preparing students for current assessments as well as for future roles and responsibilities.

Inquiry Approach at Newton-Conover Health Science High School

Hickory, North Carolina

150 students, grades 9-12

Beginning in the 9th grade, students at Newton-Conover Health Science High School are encouraged to view themselves as future college students and to prepare for admission to and success in college during their four years in high school. Instructional programs focus on intellectual, social, and emotional development. Through an inquiry approach to curriculum and instruction, the school concentrates on rigorous intellectual development by nurturing critical thinking skills and the habits of work necessary for rigorous intellectual productivity. Simultaneously, an emphasis on embedding literacy and numeracy in content areas across the curriculum ensures that students develop strong comprehension skills in all subject areas. Student achievement is assessed using multiple measures to ensure that the individual needs of diverse learners are met.

3. Stretch Learning

Stretch learning demonstrates rigorous and relevant learning beyond minimum requirements, such as participation and achievement in higher level courses, specialized courses, and so forth. This characteristic encourages a school to examine the degree to which all students are challenged to attempt rigorous coursework, push themselves to take specialized courses, and undertake interdisciplinary projects, for example. Stretch learning connects to basic beliefs about understanding and playing to the potential and strengths of learners. *(Note: This is the second of four dimensions that comprise the Learning Criteria to Support 21st Century Learners.)*

Expeditionary Learning At Casco Bay High School

Portland, Maine

250 students, grades 9-12

At Casco Bay High School a significant percentage of the learning does not take place in the school, but rather beyond the school's walls, connecting students to the real world. Students learn from fieldwork, experts, and service, in addition to learning from texts. They frequently work in the field during "expeditions." Some of the students have worked closely with scientists, writers, politicians, business people, graduate students, actors, documentary experts, and inventors. In addition to students conducting research outside the school, the teachers bring experts from the community into the classroom. These experiences maximize the students' motivation to learn and achieve. Expeditionary learning is all about stretching every student every day. Lessons and curriculum are aligned with current events and provide constant relevance to the students. Being able to choose topics and be part of the decision-making process for expeditions, the students are vested in all their classes. This approach allows the students to draw connections among subjects that they otherwise would not have seen in a traditional high school.

4. Learner Engagement

The extent to which learners are motivated and committed to learning; have a sense of belonging and accomplishment; and have relationships with adults, peers, and parents that support learning determines the level of learner engagement. Engagement is a critical aspect of the learning process, which results from connectedness, seeing value in learning, feeling safe and cared about, and being actively and purposefully part of a school community. The hands-on, work-based learning opportunities of CTE programs makes this characteristic an inherently strong element built into the foundation of all CTE programs. Student motivation leads to engagement, which then becomes a dominant precursor to achievement. One place for a school to begin measuring this characteristic is by surveying the students and staff as to their sense of satisfaction, belonging, security, and accomplishment. *(Note: This is the third dimension of the Learning Criteria to Support 21st Century Learners.)*

Project-Based Learning at Manor New Technology High School

Manor, Texas

300 students, grades 9-12

By changing the teaching and learning environment a new dynamic has emerged in the classrooms at Manor New Technology High School. Students are engaged in their learning through rigorous, standards-based project learning implemented in a one-to-one computer-student environment. While the technology provides access to tools that support each student's work, a team of students working collaboratively typically completes each project. Students rarely work in isolation and often are asked to present before their peers or authentic audiences. Manor teachers report that the most effective teams are those consisting of two or three students; occasionally more than three students might be involved as a team, but this is rare. Projects bring meaning and life to the academic content, while at the same time develop student empowerment and ownership of learning outcomes driven by team-based collaboration strategies. This complex system of instruction supports complete student growth. Total student engagement and ownership creates an environment conducive to success because students feel responsible for developing respect and trust. Students develop a strong work ethic, communication skills, and community service commitments. As a result, they are prepared for higher level education and the 21st century workforce, whether locally or internationally.

5. Personal Skill Development

This characteristic deals with development of positive character traits, good work habits, and social, service, and leadership skills that not only enhance learning, but also extend to the world beyond school. In high-performing schools, relationships are driven by guiding principles, which include respect, responsibility, honesty, trustworthiness, compassion, loyalty, optimism, adaptability, courage, contemplation, initiative, and perseverance. These schools recognized that students would not be able to benefit from a rigorous academic curriculum in a learning environment that did not embrace guiding principles. The guiding principles create a culture that permits learning to occur; they enable instruction to be more orderly, meaningful, and successful.

Highly successful schools make a deep commitment to creating personal relationships with students that will help nurture, motivate, and guide them. Teachers know their students, and often the families, well. This strong relationship helps create an environment that enables all students to achieve higher standards than in traditional schools. Students recognize that their teachers care about them and encourage them to achieve at high levels. The teachers develop a sense of commitment and pride in their students' accomplishments. If there is not a high level of positive relationships among teachers, parents, peers, and the community at large, students will not respond to higher expectations. The goal for all schools in preparing students for the future should be establishing rigor, relevance, and relationships. (*Note: This is the fourth dimension of the Learning Criteria to Support 21st Century Learners.*)

45-Day Career Preparation Period at SIATech Charter School

Gainesville, Florida

200 students, grades 9-12

Upon entry to SIATech Charter School, students participate in a web-driven new student orientation that discusses trainee expectations, submission of weekly goals, computer use, academic policy, and how to communicate needs to teachers. Before entering SIATech labs or classrooms, students must have also participated in a 45-day Career Preparation Period where they learn life management skills, basic computer skills, essential workplace skills, and participate in a shadowing experience in one of their selected areas of interest. Following the shadowing experience, students are assigned to a major area of interest or trade, and to a career counselor who follows up frequently with the student concerning progress and ways to cope with unexpected happenings.

6. Curriculum and Instruction

The 24 high schools have high-quality curriculum to guide instruction that focuses on rigor, relevance, relationships, and reflective thought. They have moved beyond curriculum to instruction by creating an instructional interdisciplinary framework for students to use in developing their skills and the application of those skills. Business and postsecondary partnerships exist with the high school community, enriching instruction. In addition, teachers across disciplines know, respect, and interact with each other on an ongoing basis. In many of these schools, students are given time to think reflectively about the knowledge they are gaining and the applications of that knowledge they are trying to utilize. In addition, teachers are given time for reflective thought, using good data, to make decisions about what and how to teach.

Schools and BOCES using NYSED's CTE Program Approval Process are required to document their *complete curriculum*, including the academic and technical content that will be delivered, as well as both postsecondary and work-based learning components.

Interdisciplinary Framework at Manor New Technology High School

Manor, Texas

300 students, grades 9-12

Interdisciplinary courses at Manor New Technology High School are team-taught in English language arts and social studies in grades 9-11. In addition, Algebra II/Physics, Pre-calculus/Scientific Research and Design, Statistics/Environmental Science, and Algebra I/Geometry are also team-taught. Project- and problem-based learning is not confined to the core or team-taught classes. Students in physical education, health, language, technology, and

engineering are involved in designing effective fitness programs, analyzing nutritional content of meals, making connections and comparisons among cultures, devising ad campaigns, and creating the newspaper, yearbook, or engineering designs. In each instance, the casual observer will find it difficult to identify the subject area specialist as projects are carefully selected, devised, introduced, and implemented. Students work easily with teachers, and technical content-specific questions are answered by the subject specialist when necessary. Almost all projects now utilize writing, math, oral presentation, technology skills, and technical reading.

7. Use of Data

More schools today are recognizing the importance of data-driven decisions. District data should be timely and reflect areas of student achievement in which teams can dig deeply to identify both curriculum that students have yet to master, and students who may need additional intervention. The community should be careful not to base decisions on single indicators of student achievement, but instead consider multiple measures, which provide additional points of view in identifying achievement. Perhaps the most important aspect that has come from the recent federal accountability requirements is the expectation to disaggregate data. Rather than looking at whole school averages, subgroups are analyzed to learn how well students are performing. It is also important to look at trends in data and the achievement of students over time, not just at a single point in time.

A laser-like focus on data at the classroom level is needed to make daily instructional decisions for individual students. Excellent schools have data that assists teachers in making decisions about instruction. They use a wide variety of data sources, such as the Lexile Framework[®] for Reading, to analyze where students' present performance levels are, how those performance levels compare to the instructional materials students use in the classroom, and the performance levels required of students as they graduate from high school. Only essential data is collected. It is then used in making instructional decisions and is communicated to students, parents, and other stakeholders on an ongoing basis. In New York State, for example, information is collected on a variety of parameters, *e.g.*, the number of students in approved programs who take and pass technical assessments, and receive technical endorsements on their diplomas; those who earn three to five units of credit in CTE programs; and those who enter postsecondary education. Academic performance data on CTE students is also collected.

Data Analysis Team at LaGrange High School

Lake Charles, Louisiana

1,202 students, grades 9-12

The Data Analysis Team at LaGrange High School is charged with the responsibility of highlighting where the school is succeeding and where it needs to change. The team compiles state test results, achievement data, and other data to evaluate programs, curriculum, and achievement. The parish staff also provide comparative data for building use. Strengths and needs are identified, and a course of action is determined in the form of school improvement goals. Data is of critical importance to the operation and vision of this school. The use of data is continued at the department level where revisions in curriculum, course offerings, and instructional techniques are determined. Teachers regularly review mid- and end-of-term assessment results to ensure rigorous and relevant instruction within each discipline. Most teachers provide pre-testing of student skills to establish the starting point for instruction.

8. Transitions

An extraordinary commitment of resources and attention to transitions as students change grades and schools are paramount in high-performing schools. Successful schools make a great effort to measure and address academic and personal skills to allow for a smooth transition to high school and improve performance where warranted. School leaders recognize the often-fragile nature of incoming students and the importance of transitional support for these students. At the end of their years at their present school, these students have typically made dramatic improvements in their basic skills, enabling them to complete the curriculum.

A small learning community approach may have enhanced the transitions where a thematic area of interest to the student may be a part of an enrichment program. The thematic program might be in the arts, environmental science, construction, and so forth. The students take intensive reading, writing, and mathematics courses that use the thematic area as the content for developing students' skills. Academies may also be used to design an

academic program built around a thematic approach that meets the students’ interests, learning styles, and aptitudes.

Mentors may have modeled expected behavior, provided ongoing guidance, and offered tutoring. Upper class students serve as mentors to 9th grade students. These upper class students model expected behavior, provide ongoing guidance to the freshmen, and in many cases tutor struggling students. Students have been indoctrinated into the culture of high expectations and caring adults.

9 th Grade Transition	12 th Grade Transition
<p>Ninth grade in many of these schools looks dramatically different from 9th grade in other schools. Students’ academic levels are analyzed as they enter 9th grade. If they do not have adequate academic skills to succeed in the high school curriculum, they are enrolled in an enrichment program. <i>Enrichment is used rather than remediation.</i></p>	<p>For students who entered 9th grade with adequate academic preparation for high school, the four-year program may be collapsed into three years. These students complete the normal high school curriculum by the end of grade 11. They then use grade 12 for internships and/or an Advanced Placement year. Through strong articulation with higher education, students are then able to earn up to 30 college credits by the time they graduate from high school.</p>

Transitions Team at Butler Technology and Career Development Schools

Fairfield Township, Ohio 14,250 students, grades 9-12

The Transitions Team at Butler Technology and Career Development Schools, comprised of members from all divisions of the organization, guides all transition activities. These include: informative brochures, open houses, tours, career days, new student orientations, a Spring Celebration for new students, an August Kick-off Festival, and career labs. All are designed to heighten student awareness, comfort level, and fit. Beginning in 8th grade, each student in the associate schools creates an online personal career portfolio. Students create four-, six-, or eight-year education plans, build professional resumes, explore and compare occupations, find a major and research college options, learn how to pay for college, and develop a repository for all career research and related experiences. Interest assessments, as well as personal skills and values assessments, help students identify a career cluster they might want to pursue. This information is available to career-technical teachers and administrators and can be used for recruiting students into their programs.

9. Leadership/Systems Approach

Solid and dedicated leadership is key in the most successful high schools. And strong leadership — leadership that is future-focused, persistent, and distributed throughout the organization — is at the center of successful and sustainable school improvement. In rapidly improving schools, leadership styles have subtle differences. Certainly each leader in these schools has an impact on the school culture, and the school community would identify the leader’s encouragement and support as integral to success. But while some of these leaders seem to possess endless stores of energy and be involved in any and all activities, others serve more in a delegation role, with assistant principals, team leaders, and school staff assuming greater responsibility in decision making, problem solving, and taking action. Both types of leaders are successful; however, simply trying to replicate either or both styles is less likely to result in long-term and sustainable school improvement.

Schools need leaders with solid skills, who are well focused and stay in the position long enough to sustain change within the school. Yet there is not a rigid prescription of practices, skills, or behaviors that will create effective school leadership; rather, it is situational and adaptive, based on complex system interactions. School principals and other administrative leaders must work effectively over time with staff and students to build organizational leadership that reflects high levels of collaboration, empowerment, and vision.

Shared Decision-Making Model at Delano High School

Delano, Minnesota

350 students, grades 9-12

The leadership at Delano High School has developed a clear and concise mission that reflects the values of the community and the world in which students will live. The principal believes in establishing foundational relationships and empowering staff to provide diverse and collaborative input and meaningful decision making. A “we can make it happen” approach coupled with hard work and an intense focus has made for significant and lasting school improvement. The Shared Decision-Making Model is credited with having made more difference in the school than any other single change. Myriad stakeholders at all levels not only provide information to the staff regarding decisions, they actually make the decisions. A culture of shared responsibility, trust, and “our,” not “administrative” decisions permeate all levels, and as a result, a better school emerges.

10. Professional Learning Communities

Sustained and supported professional learning communities are guided by the same principles as quality education for students. Professional development can be characterized as teacher-centered, rigorous, relevant, collaborative, supported, and sustained. A staff that functions as a professional learning community comes together for learning within a supportive environment. Participants interact, test their ideas, challenge one another’s ideas and interpretations, and process new information gleaned from these exchanges. Typically, teachers unite to focus on the topics of their choice that are related to instruction, student achievement, and assessment. The professional learning community is characterized by supportive and shared leadership, values, and vision; collective learning and the application of that learning; and conditions that enable the group to meet regularly to solve problems and make decisions.

Peer Teaching at Saunders Trades and Technical High School

Yonkers, New York

1,202 students, grades 9-12

Positive peer pressure at Saunders Trades and Technical High School helps teachers to do the best job they can, and they work together to make this happen. To better understand each other, the vocational, technical, and occupational teachers held workshops for academic teachers to learn more about their specific programs. This event resulted in academic teachers making soup in the culinary program, wading in streams for the environmental magnet, and taking photos with the graphics department. Teachers collaborate on a regular basis with other departments and magnets to align the curriculum areas and to create interdisciplinary units, as well as collaborate with their departments to vertically align the curriculum and skills, and plan for short- and long-term goals.

11. Struggling Learners

One of the most confounding issues for districts is increasing the performance of students receiving special education services, especially at the secondary level. With the increased focus on raising the rigor of CTE programs in New York State, this is especially true. Helping administrators and teachers deal with the issues of equity and access is very important. National performance data for these students consistently shows a significant drop off when students enter the middle grades, and that trend continues throughout the high school years. Yet, a growing number of high schools have helped these students achieve success through a persistent, long-term, strategic approach to improving their instructional opportunities.

Ensuring that every student succeeds frequently requires intervention in order to provide personalized and timely alternative instruction. The actual intervention may take many different forms. It may simply mean making adjustments to better engage a student or allowing more time for an alternative learning approach. Additional teachers or an alternative program may also sometimes be the most effective intervention.

Students receiving special education services are gaining increased attention in high school as the accountability for their academic performance increases. High schools that have established a track record of success have broken away from the traditional models used for these students and the low expectation that often accompanies

their education programs. They have sparked new ways of thinking about how to serve these students effectively, and how to implement strategies that have been identified as consistently in place in highly effective high schools.

Common Planning Time at A.J. Moore Academy

Waco, Texas

700 students, grades 9-12

At A.J. Moore Academy, grade level team meetings are conducted on a weekly basis with representatives from each core academic and career area. Special education teachers are included in these team meetings so that all staff can collaborate and use the same curricular objectives and scope and sequence. Special education teachers modify instruction through the use of alternate instructional strategies, pacing, and tutorials to help students manage their learning disabilities. This common planning time is credited with being one of the most valuable tools helping general education and special education provide grade level instruction with supports to help special education students reach high levels of performance. Furthermore, during these planning sessions, teachers can request to convene a “staffing” on any student having consistent academic or behavioral difficulty in their class. These meetings are set up with the student, parents, and all teachers of the student to discuss intervention strategies. It is an eye-opening experience for all parties involved when everyone is able to communicate all aspects of the student’s performance.

12. Effective and Efficient Practices

The decline in available resources for improving student performance calls into question the usability of education’s various support systems, organizational structures, and strategies, including CTE programs. High-performing schools are taking responsibility to find new and innovative ways to improve student performance with increasingly fewer resources. Innovative and highly successful strategies have emerged from these schools that we can learn from.

To help evaluate how schools have improved student performance and reduced costs, the International Center created the Effectiveness and Efficiency Framework. To analyze and communicate these strategies and practices effectively, as well as develop new ones, the Framework helps educators determine cost (efficiency), how to define student performance (effectiveness), and how to compare cost to performance. Using these analytical strategies, schools can begin to develop a repertoire of cost-efficient and effective practices and procedures that can substantially improve student performance.

Technology Funding at A.J. Moore Academy

Waco, Texas

700 students, grades 9-12

Utilizing technology funding at A.J. Moore Academy has significantly impacted student achievement. Funding is channeled continuously to update the school’s technology. Each core subject area has wireless computer carts to support web-based programs. In English classes, MY Access!, a web-based program, uses artificial intelligence to give students immediate feedback on their writing assignments as well as illustrate changes that need to be made to increase their scores. Recently, English language arts state test scores for all students and all sub-groups were well over 90%. Much of the score has been attributed to the increased proficiency in the writing portions of the test. The most recent addition to high-quality technology-based curriculum is the I CAN Learn® Math Lab, a self-paced algebra system designed to provide practical applications for students while they learn critical algebra skills.

Each teacher has a laptop and projector system to increase integration of technology in the curriculum. A major investment was providing each student with a TI 84+ graphing calculator for home use. The calculators are checked out much like a library book and used throughout the school year. Having the ability to use this specialized technological resource, students receive much-needed reinforcement of mathematics and science concepts each night in homework assignments. Microscopes have assisted teachers in enhancing biology instruction. Students recognize the importance of technology because they realize that they have current technology and powerful tools.

The New York State CTE Program Approval Process: A Model for Leadership and Change

The process of improving student performance goes by many different names. It has been referred to as school improvement, school reform, school reinvention, and school restructuring. No matter what it is called, it comes down to the single goal of raising student achievement through change.

In schools across the country that are making concerted efforts at school change, the following principles appear to be true:

- Change must be revolutionary in spirit and evolutionary in time.
- Each school community is unique and has its own DNA; what works in one does not necessarily translate to another.
- Schools are unique systems that tend to maintain the status quo and often produce unintended consequences in response to change.
- Schools as systems produce the results they are designed to produce. If different results are desired, the focus must be on changing the system, not simply demanding the system work better.
- School change can occur when guided by leadership, driven by data, and supported through continuous professional learning.

New York State's CTE Program Approval Process (New York State Career and Technical Education, Board of Regents, 2001) is the way the State Education Department ensures that local CTE programs are high quality and meet the needs of all students. More important, the process is well aligned with the change principles cited earlier and can easily be used to implement the characteristics of high-performing schools throughout a program and a school.

The *Implementation Guide for CTE Program Approval* developed by the NYSED (2001) is a valuable resource for local program approval self-study and external review teams. It is an aid in: (1) assessing program quality and (2) ensuring students are acquiring high-level academic skills and knowledge to be prepared for college and careers.

The Program Approval Process is currently being used by the CTE TAC of New York to drive reform efforts in selected schools across the state. It provides an ideal structure to bring an entire school community together to transform existing programs. It helps to create a common vision within a school and a culture of high expectations for all students.

Schools completing the Program Approval Process move through systematic development, clearly demonstrating that their programs meet the following criteria:

- comprehensive curriculum offering rigorous content which is non-duplicative and provides the student with a coherent sequential program of study
- curriculum that is aligned to both state and national learning standards
- secondary curriculum that is aligned with postsecondary education
- state-certified faculty with the appropriate academic and/or technical certification
- a technical assessment that meets current industry standards
- articulation agreements that are constructed to provide students with direct benefit
- work-based learning opportunities for all students
- a data reporting infrastructure that reports student performance in order to evaluate success on Regent's examinations, approved alternatives, technical assessments, and placement in higher education, employment, or the military

The CTE TAC of New York undertook the following alignment of the defining characteristics of America's most successful schools to the CTE Program Approval Process. The results reflect how these characteristics can serve as

cornerstones of quality CTE program development in New York State, providing the structure for a CTE pathway to move forward and as such becoming a catalyst for efficient, effective implementation of a CTE delivery system.

Alignment of Defining Characteristics of Successful Schools to NYSED CTE Program Approval Process

Defining Characteristics of America's Most Successful High Schools	Components of NYSED CTE Program Approval Process
1. School Culture	The self-study and the external review help create broad-based approval and support for programs across the entire school community.
2. Foundation Learning	Reviewers confirm that CTE program content aligns with state CDOS (Career Development and Occupational Studies) standards, relevant state academic standards, and related business and industry standards.
3. Stretch Learning	The school district or BOCES selects an appropriate industry standard technical assessment to measure student proficiency in the technical field for the program. The school district or BOCES may select a New York State licensing examination as the technical assessment.
4. Learner Engagement	Work-based learning (WBL) experiences make school-based learning more relevant by providing students with the opportunity to apply knowledge and skills learned in the classroom to real-world situations. These experiences focus on assisting students to develop broad, transferable skills for postsecondary education and the workplace.
5. Personal Skill Development	An employability profile provides a record of student achievement including the attainment of technical knowledge, work-related skills, work experience, and performance on core academic Regent's examinations. WBL activities collaboratively engage employers and schools in providing structured learning experiences for students.
6. Curriculum and Instruction	A thorough curriculum review ensures the curriculum and course content meets NYSED regulations, contributes to achievement of state and industry standards, and prepares students for successful completion of a technical assessment. Approved curriculum content is non-duplicative, challenging, organized along a continuum of difficulty, and free of bias.
7. Use of Data	The data system that is developed as part of the approved program provides extensive data on student progress and performance.
8. Transitions	The self-study team reviews the postsecondary articulation agreement for the program seeking approval. Postsecondary articulation agreements help students prepare for the transition from high school to advanced study in a particular career area. Articulation agreements provide direct benefits to students such as dual credits, college credits, advanced standing, or reduced tuition at a postsecondary institution.
9. Leadership/Systems Approach	Guidance is provided on each element required for CTE program approval. Aggregated statewide student and program data assist the NYSED in assessing the overall impact of the CTE policy, making modifications to procedural aspects of the policy, and determining re-certification of approved CTE programs. Reporting of data also guide future program improvements.
10. Professional Learning Communities	Reviewers confirm that professional development opportunities exist within the school district or BOCES for instructional, paraprofessional, and support staff to acquire and improve skills and knowledge related to

	instructional enhancement of the CTE program.
11. Struggling Learners	The school district or BOCES must comply with existing laws and regulations related to administration of technical assessments to students with disabling conditions and provide appropriate testing modifications. Membership of the self-study team may include a representative/advocate for students with disabling conditions.
12. Efficient and Effective Practices	The school district or BOCES retains records and reports created during the self-study phase. The collaboration among secondary, postsecondary, and business and industry has the potential to produce innovative, state-of-the-art programs.

Where Do We Go From Here?

The 24 model high schools in this five-year study have provided great insight into how American high schools can help *all* students complete an academically rigorous and relevant curriculum. While there is no one formula for a successful high school, certain characteristics appear to be consistent across the model schools. The findings indicate that model CTE programs are helping to lead the way in fostering the characteristics of successful high schools and thus they are becoming a driving force in school improvement.

Over time, comparisons to the many good academic high schools and CTE programs that will need to make further changes to be classified as great (*i.e.*, *all* students equipped with a rigorous and relevant education and thereby achieving academic and career-ready success) will be especially insightful.

It is the recommendation of the CTE TAC of New York that more schools use the CTE Program Approval Process as a way to integrate the 12 characteristics of America’s most successful high schools, thus expanding the opportunities for students to be college *and* career ready upon receiving a New York State high school diploma, and thereby helping to achieve the Board of Regents’ goal of enhancing student achievement at all levels. Model CTE programs can embrace their role in delivering academic skills and knowledge to improve student achievement, and model academic high schools can likewise embrace their role in career preparation. The CTE TAC of New York is presently engaged in identifying high-quality New York Approved Programs with significant models of integrated academics.

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