

A VISION OF THE 21ST CENTURY

The new vision for the 21st century is reflected in ACTE's recent position paper on strengthening the American high school through career and technical education.

By Gene Bottoms

You cannot achieve both rigor and relevance in high school for most students without modern career and technical education. We must continue to raise students' academic achievements and their high school completion rates. But, the way the American high school is configured to ensure that CTE will help achieve those goals varies from community to community. Instead of a single model or strategy that fits all, I envision a portfolio of strategies in which CTE is one part of an overall strategy to ensure students are adequately prepared for the dual goals of work and postsecondary education.

One strategy in this portfolio is organizing large high schools around wall-to-wall, career-based small learning communities,

where students take a solid academic core. Some students will take more academic subjects, while others enter pathways leading to work and further studies. Within the small learning communities, there should be clear career pathways linking rigorous academics to career and technical studies and to postsecondary and work-site learning.

Another strategy that will fit some communities is growth in what I call choice technical high schools. There are more than 200 of those institutions in the country. As communities develop a portfolio of choices, one can envision a choice technical high school that teaches a college preparatory academic core—but with very high-quality career and technical studies—with a dual objective of work and further study.

The third strategy involves strengthening the career/technical curriculum in the high school. Students will complete a solid academic core in grades nine and 10, which will provide opportunities to explore various career and educational fields. In grades 11 and 12, students will choose an educational or career concentration. Here, I envision many high schools partnering with community colleges, other postsecondary institutions and employers with the goal of providing students access to high-quality career/technical studies.

A fourth strategy will concentrate on rural areas, where a vital part of the 21st century education strategy will be giving students access to career and technical centers. In this instance, I see students spending more time at these centers during their last two years of high school and having their academic lessons delivered through an applied instructional approach.

Finally, I expect continued growth in magnet and charter schools developed around career and technical themes. It's my prediction that there will be more schools offering CTE linked with demanding academic studies. Some schools will be theme based, and some will focus on occupation-specific programs leading to definite jobs and to advancing postsecondary studies.

Teaching for the 21st Century

Increasingly, in terms of career and technical teachers, there will be a strong emphasis on academic and career and technical integration in the 21st century. I see academic and CTE teachers planning together on projects linking academics and CTE courses and identifying themes that tie the curricula together. Organizing high schools to provide teams of teachers with common planning time will increase the emphasis on linking high-level academic content to real-world problems. In mathematics and science,



teachers will make greater use of the career and technical pedagogy of applied learning and using authentic real-world problems to engage students in challenging content.

On the career and technical side, more CTE teachers will use literacy strategies, not to teach students how to read, but to engage them in reading, talking and writing about the career fields they are studying. One requirement that employers have for high school career and technical graduates is that they are literate in the field they are studying. Employers want employees who can talk the language of the field, read and comprehend the current technical language, and write in the language of the field. Career and technical teachers will need training to adopt instructional pedagogy that engages students in becoming fluent in the technical language and competent with the technical materials. Then, their students will be more valuable to employers, because they will have mastered the skills necessary for continuous learning.

CTE teachers must be purposeful about giving assignments requiring students to use mathematics. They will have to change their instructional planning and assessment to achieve this. Historically, we do a lot of group, project-based learning in CTE, and that will continue. However, we frequently only evaluate students on the product or service produced. I see a shift occurring, where teachers will continue to evaluate the products or services on quality, but will expand their evaluation to determine if students have mastered the mathematics involved; and whether they can read and interpret the materials involved in completing their project. In the 21st century career and technical classroom, it is important that all students, not just one or two members of a project team, can understand the concepts involved, can interpret the materials and can do the mathematics involved.

Because of these requirements, the Project Lead the Way curriculum becomes a model for the 21st century high school curriculum. First, it is built around project-based learning. Second, teachers must have two weeks of training before they can teach each course. They must be able to demonstrate that they can do the mathematics and read material related to the course. Third, there is an end-of-course exam to determine if students can demonstrate comprehension of technical material and apply the mathematics procedural and reasoning skills essential to work-related problems.

I envision more of the 21st century career and technical courses adopting advanced placement characteristics. There will be a prepared curriculum, training for the teacher to implement that curriculum and an assessment to determine if students have mastered it.

The Value of Certification

Increasingly, youth who go directly into employment after high school will be in high school programs leading to employer certification. They may have to spend additional time in a postsecondary institution or in an apprenticeship before earn-

ing that certification. That view is consistent with the ACTE position paper, *Reinventing the American High School for the 21st Century*.

As more students finish high school, there will still be some who don't enroll in postsecondary education. We must make sure that they have access in high school to career and technical programs where they earn employer certification through an assessment that employers value. The assessment will test not only their technical knowledge, but whether they have the necessary academic skills to continue learning in the workplace.

The state of Kentucky is a good example. They have worked with employers to develop program exams in a number of fields and have been administering them for several years. As a result, the gap is closing between academic students and CTE students.

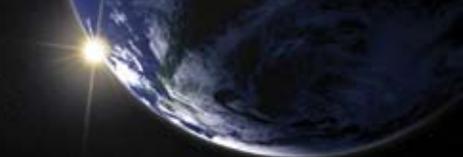
In Virginia, about 6,000 students a year graduate from high school and pass employer certification exams. But, before a student can qualify to take the exam, they must be taught by a high school career and technical teacher who has passed those exams.

It is my view that, in the future, high school CTE teachers will need to demonstrate mastery of the academic content required of their students. CTE teachers will have to demonstrate that they know how to integrate academic and technical studies, and they will be required to have a credential verifying they have mastered the broad career field in which they are teaching.

More high schools will adopt a school improvement design similar to High Schools That Work (HSTW)—a design that advocates a solid academic core blended with high-quality career and technical studies, and that links its academic core and career focus with other key practices that make students successful in high school. This will be coupled with efforts to create better links between high schools and two- and four-year postsecondary institutions.

I envision more students in grades 11 and 12 enrolled in CTE courses taught to postsecondary standards. Those students will leave high school with accrued postsecondary cred-

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its—particularly those students who have met the academic prerequisites in language arts/reading and mathematics—for entering credit-bearing courses at the postsecondary level.

My vision for the 21st century is that the advisory committees for high school CTE studies will broaden beyond employers to include representatives of two- and four-year colleges, and planning will include more high school CTE programs that have a vertical reach. Students will see different places for exiting—at the end of high school, or at the end of two years, or at the end of four years.

We'll begin to think about career/technical curriculum not as being terminal at the end of high school, but in the context of being dual in nature. That means benchmarking high school CTE courses, as well as academics, to the prerequisites for further study. There is no reason that a 17- or 18-year-old cannot master materials to the same depth and level as a 19- or 20-year-old. More and more youth are going to leave high school carrying credit that will be accepted at a local college.

Failure Is Not An Option

For those CTE students planning to enter postsecondary education, but who reach their senior year without the necessary mathematics and language arts prerequisites, I see the senior year being revamped, so that they can take special classes to meet the necessary requirements.

CTE must be coupled with broader high school reform efforts. We must have a solid guidance and advisement system beginning in the middle grades. By the end of grade eight, every student should have a goal beyond high school and a plan for achieving that goal—and the parents must be involved. The plan should be reviewed annually in a one-hour meeting with the student, the adviser and the parents. Having one person who is a student's adviser for all four years of high school and who is the connection between the student and the student's family is fundamental to reforming and to linking career and technical programs to a solid academic core.

Another factor for success is providing extra help when necessary. We need a system to reduce the number of students entering grade nine unprepared and one that will bring them up to grade level standards, so that they can be successful in a variety of career fields.

Ninth grade is crucial, especially for students at risk of dropping out of high school. It is important that, as we catch them up in academics such as mathematics and language arts/reading, we provide them with some type of career exploratory opportunity. There are a number of ways of accomplishing that, but students should have an opportunity in grade nine to explore CTE, postsecondary education, and a variety of career pathways. They need opportunities to see a path through high school to a good job. On their way to preparing for a better job, many will discover other goals.

Failure cannot be an option in high school. This does not mean lowering standards in either academic or career and

technical classrooms. It means having systems in place to help students meet standards. You have to do this in a manner that lets students know you care about them, and lets them know that what you are asking them to learn is important to their future. If they believe those two things, nine out of 10 students will respond positively.

The last issue to consider is the transition of students from high school to further studies. Many students who go on to postsecondary education spend their first year learning what they should have learned in high school. As a consequence, they never get a postsecondary credential, which is the hallmark for achieving higher earnings. That is why it is important for students who enter their senior year unprepared for postsecondary education to be involved in a mathematics program designed to give them what they need—from arithmetic to algebra to geometry—and that they have an English course that engages them in interpreting a wide range of materials through both written assignments and oral conversations.

Leading for the Future

You must have high school leaders who understand the power of high-quality career and technical studies as a motivational tool for students—a way to make mathematics and science come alive. They must understand what quality programs look like. You must have school principals who view CTE not as a place where you send students for an easy credit, but as a place that adds relevance and meaning to the total high school curriculum and as a method to engage students in a different approach to learning. This is a challenge for those who prepare school leaders and for those who select school leaders.

Based on the last 20 years of research and in working with more than 1,100 high schools across the country, this is the bottom line of what we've learned at the Southern Regional Education Board. There are positive results when adults in high schools change their behavior and implement a rigorous curriculum; high-quality career and technical studies; high standards in both academic and career and technical classes; and a strong support and advisement system. Effective school leaders are those who engage their faculty in continuous improvement, and who teach students to see connections between their academic studies and their lives.

In high schools where adults change their behaviors to reflect the spirit of ACTE's *Reinventing the American High School for the 21st Century*, students change their behaviors in a more positive way. More of them see high school as linked to their future. They come to class better prepared. They are more engaged in their studies. Their grades and achievement improve. If ACTE's message is taken to heart in high schools across America, it can transform how students view their high school experiences.

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