

By Charles Mojkowski and Elliot Washor

Seeding the Edge of Career and Technical

THE “COLLEGE READINESS” WALL NEEDS TO BE REPLACED BY A LIFELONG LEARNING AND WORK CONTINUUM, IN WHICH STUDENTS BUILD A DYNAMIC LIFELONG LEARNING PLAN FOR MOVING ALONG THAT CONTINUUM.

There is a story told about Albert Einstein when he was teaching at Princeton in the late 1930s. In reading Einstein’s final course exam, one of his colleagues observed that the questions were the same ones Einstein used for the course the previous year. “You are correct,” replied Einstein, “but the answers are different this year.” Einstein’s response says much about the state of theoretical physics in the pre-war period, and it says much about our current notions of career and technical education (CTE). While the questions about the what, why and how of CTE are seemingly perennial, the answers are indeed quite different this year and promise to be more so going forward. There is a resurging interest in CTE from business leaders, policymakers and educators who have discovered, and in some cases rediscovered, the benefits of authentic applied learning embedded in career pathways that combine a robust mixture of relationships, relevance and rigor.

Despite the growing interest, many policymakers, parents, employers and the community at large—even many educators—continue to view CTE as a second-tier program for those students who are not realizing success in the traditional, first-tier high school program. In our current work developing new program designs for CTE, however, we are trying to change that perception and create CTE programs that have substantial implications for all students in all high schools, and perhaps for those even in middle schools. We believe that our designs can contribute to a much needed re-branding of CTE as a first-tier program of choice, while also serving as a catalyst for fundamental secondary school redesign.

Our sense is that CTE’s potential will

best be realized by creating program designs that are a good deal “edgier” than prevailing practice and even some currently proposed innovations. We have some suggestions for specific innovations that are a good bit outside the CTE mainstream, innovations that we believe are absolutely essential if 21st century CTE programs are to serve a substantially larger number of students and help them achieve success as citizens, parents and workers.

1. Create comprehensive and coherent programs of applied study. The half-day programs of study that characterize many current CTE programs often confuse students and miss powerful opportunities to connect them to authentic, relevant and rigorous learning. Half of their schooling engages them in real-world rigorous work and workplaces. The other half confronts them with unauthentic, disconnected traditional instruction in discrete academic subjects driven by the assumed need that all learning standards must be addressed to all students. Truly edgy CTE designs will go beyond aligning the two sets of standards to seamlessly embedding relevant academics within the authentic experiences of the career path. Such a level of integration may require abandoning the traditional course structure as the organizing framework for a program of study, and challenging the notion that all of the standards in each of the subject areas are equally important for each student. CTE can lead the way in developing innovative ways of embedding 21st century skills and academics in career learning in ways that are unique and necessary for each student. Edgy CTE designs will have each student focusing deeply on those standards most relevant to his career pathway, even forgoing, at least temporarily, substantial attention to those standards

Charles Mojkowski

is an independent consultant and a senior associate at the Big Picture Company in Providence, Rhode Island. He can be contacted at cmojkowski@cox.net.

Elliot Washor

is co-founder of the Big Picture Company and of the Met School in Providence, Rhode Island. He can be reached at ewashor@bigpicture.org. Both Mojkowski and Washor are currently working on new program designs for career and technical education.

irrelevant to that pathway.

At the edge, we will need to recognize that the fixation on requiring that all students master all standards in the same scope and sequence is a major impediment to deeply engaging a substantial majority of high school students in rigorous learning and work. The “solid academic core” that Gene Bottoms identifies as essential in a 2006 *Techniques* article must address real-world professional standards. Moreover, increased attention to such a core should not be interpreted to mean a traditional structure of courses and subjects. And Bottoms’ recommendation that CTE courses take on the character of AP courses must surely be questioned, given the failure of so many of these courses to give sufficient attention to real-world applications, and their contribution to a course-taking arms race that is alarming many colleges and universities. From our perspective, such proposals should not constitute a vision of CTE’s future.

2. Personalize and customize student programs of study.

If it is true that most innovations are created across disciplines and career pathways, then it will be necessary to allow students to breach the traditional theme-based walls that characterize most career academies. Students will need opportunities to “think outside the boxes” of career pathways, themes, courses, grade levels and subjects. Cross and multiple pathways should be open to all students based on their productive interests. Simultaneously, school and program choice will need to be supplemented by customization within programs for individual students. By fitting the program to the learner rather than fitting the learner to the program, edgy CTE programs can build on and out from students’ interests and talents. A key enabler of such changes is redesigning the organizational structure and role of the teacher. Rather than students struggling to make sense of, and see purpose in, what teachers present, teachers will need to design “just right” and “just in time” instruction for not just all students, but each student.

3. Strengthen real-world learning.

Connecting to students’ interests and talents provides a strong motivation for learning, particularly for students who are



not well served by traditional academic programs. We have argued elsewhere that authentic rigor emerges over time in a student’s learning as a consequence of deeply engaging the student in learning within her interests. From this perspective, rigorous and challenging learning does exist external to the student, but emerges when the student chooses to dedicate himself to the challenge and reward of authentic, engaged and productive learning. This vision of rigor is consistent with books written by Mike Rose and Robert J. Sternberg asserting that the 21st century world demands multiple ways of being smart and creative. Rigor is found less in the quantity of courses, readings and assignments than in specific essential student behaviors, such as:

- Addressing problems that are messy and complex.
- Undertaking projects that go deep as well as broad.
- Addressing multiple disciplines and investigating their interdisciplinary connections to the core topic or problem.
- Deeply engaging the work, emotionally as well as intellectually, over extended periods of time.
- Working with expert practitioners who are doing similar work to their own.
- Continually revising both the process and the product of their learning and work.
- Demonstrating their learning and work through real-world exhibitions and performances for teacher, expert, peer and

public review.

- Discovering new questions and challenges that lead to new problems and projects.

While traditional academic programs are striving to bring more relevance to their curriculum, cutting edge CTE programs will bring much strengthened academics to their already relevant curriculum. The Ford PAS (Partnership for Advanced Studies) curriculum is one example of how traditional student learning standards can be embedded within an innovative CTE program. More work, however, needs to be done to address real-world professional standards for a much broader range of skills and values, whether they are taught in the workplace or at school. Again, such changes have substantial implications for teachers and their role in the learning process.

4. Viewing the CTE system as a seamless pathway from high school to college.

The nine-14, perhaps even the seven-16, grade span should be viewed as one developmental continuum, with students progressing through levels of proficiency—without artificial barriers or benchmarks—leading to diplomas, degrees, certificates and licenses. The “college readiness” wall needs to be replaced by a lifelong learning and work continuum in which students build a dynamic lifelong learning plan for moving along that

should allow students to continue their learning in two- and four-year college programs as well as other traditional and nontraditional learning environments. This continuum should also prepare students to obtain additional certifications and licenses efficiently without having to start from the beginning every time they reenter the post-secondary system.

The traditional education pathway of four years of college immediately following high school graduation may be inappropriate for the majority of students. For some, a combination of work and schooling—even travel and/or a gap year—over a more extended period (six to eight years) may be more suitable. Indeed, for a substantial portion of high school students who currently do not attend college, an income and opportunities for maturation may be essential contributors to college attendance and success. Rather than directing or misdirecting students toward a singular and one-size-fits-all outcome, CTE programs will need to aggressively support a much more diverse set of life-long learning pathways.

5. Expand the range of options for engaging students in real-world learning and work.

Such options should include internships and apprenticeships for those students who demonstrate readiness to make contributions in the workplace. For many students who struggle to see the relevance of isolated academics, learning by doing at the side of an accomplished professional holds the key to unlocking the value, purposes and benefits of learning. For many students who need to support themselves, and sometimes their families as well, a paid internship may be the only option for continuing to learn. For many students who do not have access to postsecondary options and connections, internships, apprenticeships and other work-based learning experi-



ences may be the jump-start they need. Also important are reconstituted and revitalized mentoring programs, with substantial investments from employers in mentor training and support. Edgy CTE programs will incorporate certifications and licenses that can be earned starting in grades 11 and 12 and lead to postsecondary learning and careers.

Additionally, edgy CTE programs will need to incorporate as standard components in their design and structure delivery mechanisms that are rarely used. For example:

- Engaging students in authentic projects within a business in order to address a real problem.
- Locating entire CTE programs within a business or non-school organization.
- Connecting learners and mentors, experts and expert practitioners via video conferencing and related online networks.
- Teachers working with students over several years in order to know them well as individuals and as learners.
- Teachers following students into post secondary learning and the workplace to provide ongoing support.

Such uncommon practices not only expand our notions of what kind of work students can do, but challenge us to think about new kinds of situations,

contexts and relationships that can be created to facilitate authentically rigorous learning and work.

6. Employ performance demonstrations for assessing student mastery of the integrated program of study. Even seamlessly embedding academics within relevant workplace and career pathway skills will not be sufficient without simultaneously raising the scope and quality of performance assessments applied to the newly integrated whole.

Without such improved assessments, it will be impossible to provide students with opportunities to practice, demonstrate and recognize the importance of what they are learning. Although raising the scope and quality of such assessments is very challenging work, it provides an opportunity for CTE to establish the gold standard for how performance assessments can and should be applied.

A recent event may help to crystallize our sense of such assessments. Sitting on a panel critiquing a student's exhibition of her design work done at Sweat Equity Enterprises, a youth development program in Manhattan, designer Marc Ecko, CEO of Ecko Industries (an international manufacturer of youth fashion), commented, "This student demonstrates the skills that most Parsons and Rhode Island School of Design graduates take two years to acquire. I would hire her right now and expect that she would make significant contributions in my design shop." Such assessments help to authenticate students' accomplishments and help them validate who they are in ways that traditional school measures cannot.

Authentic performance assessments are a distinguishing characteristic of high-quality CTE programs, particularly when such assessments are aligned with the overall program design and stress real-world performances and applications that assess 21st century skills. As

the recent report by the National Center on Education and the Economy “Tough Choices or Tough Times” argues, “moving from America’s tests to the kinds of examinations and assessments that will capture these and other qualities at the level of accomplishment required will entail a major overhaul of the American testing industry.” The goal should be not only to change the assessments, but what is assessed, addressing not only what the student knows but his know-how and even know-why.

Futurists tell us that the future is already here; it’s just not evenly distributed. We see the truth of that insight in selected innovative programs around the country, many of which are not even part of the current CTE system. Like the old Polaroid pictures, these innovations are only now emerging, are far from fully developed, and far from fully scaled. We have learned much from collaborating with innovators in these organizations about the possibilities for pushing the edge of CTE.

- **Big Picture Schools** employ customized and individualized learning plans that address student interests, a single teacher who works with a student for all four high school years, a comprehensive performance assessment system, and a high school to postsecondary and work place transition system (www.bigpicture.org).
- **Sweat Equity Enterprises** uses strong collaborations with the fashion industry to address professional industry standards and develop appropriate certifications (www.sweatequityenterprises.com).
- **Ford PAS**, a Ford Motor Company Fund program, uses customizable real-world learning modules that are being piloted at the community college level with participants accruing college credit (www.fordpas.com).
- **The Met School** (www.metcenter.org) is working in partnership with the National Foundation for Teaching Entrepreneurship (www.nfte.com) to support a group of students who have

created and marketed a new soft drink (www.pbs.org/merrow/tv/newshour/teachingentrepreneurship.html).

- **ACME Animation** provides online mentoring to graphic arts students by expert professionals working in industry-leading corporations (www.acmeanimation.com).
- **The Henry Ford Academy** has developed strategies for using museums and other cultural centers as real-world learning contexts (www.hfacademy.org).
- **New Tech High** is using an online system for developing student projects connected to the real world and addressed to state standards (www.newtechhigh.com).

These examples are indicative of the many other programs throughout the country that are developing components that can contribute to a re-branding of CTE and to the breadth and depth of results we need. CTE must move from pockets of exemplary practices to fully integrated and scalable systemic program designs. Such new designs will likely require that the prevailing CTE paradigm itself be challenged. Drawing again from Einstein, who reminded us that problems and challenges cannot be understood or addressed at the level at which they were created, we need to seed the next wave of innovations by embracing the larger context in which CTE as we now know it is developing. That context includes not only the comprehensive secondary school system but, for example, postsecondary education and youth development as well.

Raymond Loewy, called by some the father of industrial design, coined in the mid-1900s the useful acronym MAYA—Most Advanced, Yet Acceptable—in challenging engineers to simultaneously work at the edge of their discipline while recognizing their obligation to serve their customers and society. Similarly and more contemporary, Clayton Christiansen, Harvard Business School professor and author, calls for developing disruptive and catalytic

innovations that seed the edge of practice. For CTE to lead the way, it will need to move to the edge, to MAYA, to recognize the limits of the prevailing design, and be willing to challenge prevailing traditional systems.

Based on Einstein’s theories, physics came of age with the harnessing of the atom for energy, by an unparalleled change in practice. CTE can come of age by converting the edgy components into a true system in order to achieve a similar unparalleled change in practice and to create different answers that we need. ■

References

- Bottoms, G. (2006). “A Vision of the 21st Century.” *Techniques* 81(5), 14-17.
- Hunter-Quartz, K., & Washor, E. (2007). Small Schools as Multiple Pathways to College, Career, and Civic Participation: Can They Balance the Individual and Collective Aims of Schooling? In “Multiple Perspectives on Multiple Pathways: Preparing California’s Youth for College, Career, and Civic Responsibility.” Retrieved January 24, 2007, from
- National Center on Education and the Economy. (2006). “Tough Times for Tough Choices.”
- Pappano, L. (2007, January 7). “The Incredibles.” *New York Times*.
- Rose, M. (2004). *The Mind at Work: Valuing the Intelligence of the American Worker*. Viking.
- Sternberg, R. (2003). *Wisdom, Intelligence and Creativity Synthesized*. Cambridge University Press.
- Washor, E., & Mojkowski, C. (2006). “What do you mean by rigor?” *Educational Leadership* 64(4), 84-87.