

THE NEGLECTED MAJORITY—REVISITED

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ABSTRACT

Career and Technical Education (CTE) is in a curious position as the nation moves into the 6th year of the No Child Left Behind (NCLB) school reform era. The demand for skilled labor in many occupational sectors is strong and growing. Studies have shown CTE helps increase students outcomes and achievements. This ought to be good news for CTE. However, due in large part to NCLB, secondary CTE is increasingly under pressure as schools try to address the perceived education gaps by adding more academic courses to the school day squeezing out time for electives and especially CTE.

How should CTE professionals best respond to these pressures? A possible road to success is to embrace change and position CTE as a means for helping achieve the goals of high school. In this paper, I examine how high quality CTE can benefit students directly and provide a framework for addressing larger school reform issues.

INTRODUCTION

The American high school, the object of much discussion and debate since the publication of *A Nation at Risk* (Gardner, 1983), is in a curious position today. Despite more than 20 years of reforms and increased graduation requirements, most notably in math and science, we arrive at the threshold of the 21st century with increasing drop out rates and stagnant achievement measures.

According to the Urban Institute's analysis of high school completion (Swanson, 2004), only 68% of young people successfully complete a regular high school credential. In fact, there has been a steady decline in this important measure since the late 1970s. Youth in urban schools fare much worse. Math and Reading scores for 17 year olds have remained flat since the mid 1980s or early 1990s, respectively (National Assessment of Education Progress or NAEP, 2005).

For those who do complete high school, slightly more than a third of white students, less than 20% of black students, and about 10% of Hispanic students will complete college (Hoffman, 2003; Venezia, Kirst, & Antonio, 2003). For those who complete college, their degrees are having less value in the market place—and they are exiting college with an

average of \$20,000 in college loan and credit card debt, an amount described as unmanageable (Public Interest Research Group, n.d.).

The intent of this paper is to provide a brief critique of the current state of education reform and present a case for a revitalized Career and Technical Education in American high schools.

WHITHER THE REST?

So, what happens to the other two-thirds of young people who successfully complete high school? Data suggest that most are inadequately prepared for the workplace or continued education although many will attempt college at some point. Fully 65% of recent high school graduates are in college within the first few years after high school according to some surveys. For this and other reasons, this has led to too many colleges chasing many marginal students according to some. Jerome Murphy of the Harvard University School of Education was quoted as saying, "If you have a high school diploma—and can walk and talk—you can graduate from college." "There are a lot of empty seats" (Rubenstein, 1998). However, the attrition rates and attendant costs of such behavior are high. According to Jim Rosenbaum at the University of Chicago, 31% of those who start exit their college experience having earned zero credits (Rosenbaum, 2002).

Indeed, one could make the case that the U.S. has too many college graduates, not too few. Recent projections from the Bureau of Labor Statistics suggest that the US economy will only require about 13% of its workforce to possess a baccalaureate and another approximately 8% to possess more than a baccalaureate (Bureau of Labor Statistics, 2005a). In the most recent U.S. Census (U.S. Census Bureau, 2000), approximately 26% of adults possess such credentials. Arguably, the United States has a 5% "surplus" in higher education, credentialed workers. In fact, the U.S. surpasses all other advanced nations in the proportion of workers with university degrees, according to the Organization for Economic Cooperation and Development. Apparently, our students need college just to reach achievement levels other nations expect of high school age students.

This pursuit of a college credential is driven by the belief that the high school degree holds little value to employers. The college degree has become a proxy for a host of basic qualities: good communication skills, analytic ability and the capacity to keep learning on the job—skills once thought to be the domain of a high school education. This view is supported by critics like Ron Bullock, chairman and chief executive of Bison Gear & Engineering Corporation who has been quoted as saying that high school graduates are not ready for employment in the modern manufacturing plant. His firm manufactures motorized gears and about one in seven of his employees has some kind of engineering degree. His company needs people who can be group leaders, show up for work reliably and exercise initiative. Bullock doesn't get what he needs from the public schools. But do college graduates get a good return on their investment?

A DIMINISHING RETURN TO THE COLLEGE DEGREE?

Income levels for the average college graduate have stagnated. After adjusting for inflation, the average income of college graduates holding full-time jobs rose by only 4.4% between 1979 and 1997, or at a minuscule annual rate of 0.2% and fell by more than 5% between 2000 and 2004 (Dew-Becker & Gordon, 2005). This figure becomes more abysmal if you exclude medical doctors and lawyers whose incomes have grown dramatically during this time. At the same time, workers with only high-school degrees saw their real income plummet by 15%. The conclusion: the much advertised college wage "premium" for the baccalaureate degree is due primarily to the fall in inflation-adjusted salaries of workers who have not been to college. This is true except for the very wealthy. Those whose earnings place them in the top 99th percentile (earning more than \$400,000 per year) saw their earnings rise 87% during this time period; those in the 99.9th percentile (earning more than \$1.6 million per year) enjoyed an increase of 181%; and those in the top 99.99th percentile (\$6 million per annum) enjoyed earnings growth of 497% (Krugman, 2006).

Many college graduates are finding that their college degree do not land them the high paying, quality job they are seeking. They find themselves in low-paying service jobs and other lines of work not traditionally associated with a college education—an issue highlighted by Hecker (1992). From this perspective, graduation no longer provides reasonable assurance of a "college-level job," e.g., a white-collar job in an organization that provides reasonable pay, good benefits, training opportunities, and the prospect of advancement at least to middle-management or mid-level professional status. In fact, if you don't go on to graduate school or are not among the top graduates at one of the nation's elite colleges, chances are the average of \$20,000 in college debt buys no economic advantage. Rubenstein (1998) has shown that the flood of graduates in recent decades has been so great that an increasing proportion have found themselves, within a few years, employed in "non-college jobs" such as those in the retail sales clerks, administrative support, service, precision production, craft or in other jobs that do not require a college degree. In 1995, approximately 40% of people with some college education—and 10% of those with a college degree—worked at jobs requiring only high-school skills. That was up from 30% and 6%, respectively, in 1971. Pryor and Schaffer (1997) found that the proportion of graduates saying that their job did not require college-level skills increased from 24% in 1976 to 44% in 1991 and remained at that level in 1994. Rosenbaum (2002) reported similar results. Of course, the data are subjective, but the fact that the question and the methods remained essentially the same over time provides some confidence that the graduates' opinions reflect real changes.

THE CURRENT AND LOOMING SKILL SHORTAGE

The diminishing returns to college come at a time of increasing need for genuinely skilled workers. The National Association of Manufacturers (2005) has recently reported that 81% of the manufacturers in the country have indicated they are currently facing a moderate to severe shortage of qualified workers—even though manufacturing is suffering serious layoffs. They identified three deficiency areas of public schools in

preparing students for the workplace: basic employability skills, math and science, and reading and comprehension. Meanwhile, many well-paid and rapidly increasing manufacturing jobs remain unfilled, including those requiring two- and four-year technical degrees or short-term skill certificates. Jobs in manufacturing are varied and averaged \$54,000 in total compensation in 2000, a salary level 20% higher than the average compensation for all American workers— while 83.7% of manufacturing employees receive health benefits from their employers, more than any other employment field.

Technology plays a key role in the shortage of skilled workers. The cars we drive today have more powerful computer technology than did the Apollo spacecraft that landed men on the moon. Modern auto manufacturing involves computer systems and global satellite positioning equipment. According to a report, Automotive Youth Education System (AYES), the job of an automotive technician today bears little resemblance to the auto mechanic of years past. Today's technician needs advanced technical training and the same kind of critical thinking skills as an electrical engineer. Today's experienced technician is well compensated, with typical income ranging from \$30,000 to \$50,000 a year and even \$100,000 in large metropolitan areas.

The U.S. Department of Labor projects that healthcare occupations will make up 12 of the 20 fastest growing occupations in the 2004-2014 period (Bureau of Labor Statistics, 2005b). The lack of skilled labor in this high growth area is becoming more apparent each year. In the state of California for example, 10,000 new registered nurses will be needed each of the next 10 years. California colleges are producing half that number. This labor shortage has driven salaries for nurses—a two-year degree program in most states—to \$70,000 per year in many urban communities and many hospitals are offering signing bonuses to attract employees. In addition to the nurse shortage, hospitals are having difficulty finding the technicians to do the lab work and run X-ray and ultrasound machines.

High tech extends to even janitorial roles. Automatic flush toilets in public restrooms require maintenance of electronic systems. Janitors are confronted with machines that are more complicated and need basic math to dilute industrial chemicals properly and basic reading skills to ensure they are handled safely. The list of occupations requiring essential academic and technical skills grows by the day. Yet the one part of the high school program, career and technical education, where young people can engage in this kind of learning is diminishing.

THE ROLE OF A REVITALIZED CAREER AND TECHNICAL EDUCATION IN 21ST CENTURY AMERICA

School reform is a perennial issue in American education. At the turn of the 20th century, John Dewey (1900, 1916) described reasons to be concerned with educational improvement that are just as cogent in the early years of the 21st century: furthering democratic ideals through a broadly educated citizenry, and obtaining a viable economic future for all of our citizens. Ultimately, what is and isn't included in the high school

curriculum is a direct reflection of those skills and attitudes valued by the society (and therefore necessary for the economy) at any given time in history. As one listens to the current education debate, it is easy to conclude that the K-12 system primary role is to prepare youth to enter college. However, in other times there has been broad recognition of multiple roles of public education such as teaching youth how to get along in life and to perform major adult functions, including employment, family/parent, citizen, scholar, friend, intimate partner, financial manager and planner, and member of society. Still other scholars propose that one of the major roles of education is the transmission of democratic ideals.

In the context of technology changes and economic challenges, it appears to be the most important changes that need to be supported is to increase the academic skills of career and technical education (CTE) students, erase the stigma attached to vocational education, and see that all students meet appropriate academic and industry standards. The goal of CTE should be for all students to finish high school prepared either to enter the workplace (which had come to demand strong academic skills and other “new basic” skills) or to begin postsecondary education. This broader mission challenges vocational educators to teach beyond the confines of specific occupations and, instead, to prepare students for a more demanding world of work.

In moving beyond the traditional CTE approach, the new CTE programs can provide students with education about work, education for work, or education through work. That is, CTE can introduce youth to the workplace and help them develop generalizable workplace skills. CTE programs can prepare youth with occupation-specific workplace skills that provide documented economic benefits after high school. Finally, CTE provides a context through which critical academic skills needed for transition to the workplace or continuing education in math, science and reading can be enhanced.

Education About Work

Education about work, like education through work, is meant to be broad. The curriculum assumes that career and technical knowledge—knowledge about the world of work—is valid school content and belongs in the common core of knowledge that all students should possess. All students need to learn about social aspects of work, such as democratic rights in the workplace, safety, and the prospect of race or gender discrimination. They need to know about career ladders, labor markets, job-seeking skills, and job-keeping skills. They need to understand how to allocate resources effectively, acquire and use information, develop solid interpersonal skills, use and troubleshoot technology, and work with and modify systems used in business and industry.

Murnane and Levy (1996) identified nine “new basic skills” necessary for success in the workplace of the 21st century: reliability, positive attitude, willingness to work hard, ninth-grade-or-higher mathematics abilities, ninth-grade-or-higher reading abilities, the ability to solve semi-structured problems at levels much higher than today’s high school graduates, the ability to work in groups, the ability to make effective oral and written

presentations, and the ability to use personal computers to carry out simple tasks such as word processing.

Clearly these are valuable skills, both for preparing for postsecondary education and for the world of work. Murnane and Levy (1996) argued that the majority of these skills are not being taught to most U.S. high school students. A series of commission reports during the 1980s and early 1990s concurred, warning of the economic consequences of the growing shortcomings in the education of young Americans (Commission on the Skills of the American Workforce, 1990; *A Nation at Risk*, National Commission on Excellence in Education, Gardner, 1983; *The Forgotten Half*, William T. Grant Foundation, 1988).

Education Through Work

All students should have the opportunity to learn school subjects with work as the context of their learning. Dewey called this “education through occupations” (1916, p. 309). Stone (1995) described ways in which workplace learning could be harnessed to reduce the achievement gap, especially in urban locations. He pointed to opportunities in urban communities that had work or learning potential, such as rehabilitating homes and buildings and meeting the needs of children and the elderly. Communities abound with work and learning opportunities, and these have power to transform the entire curriculum.

Another strategy for using the context of work to improve academic skills is through curriculum integration. While there are multiple interpretations of this concept and much disagreement about its value, the National Research Center for Career and Technical Education (NRCCTE) at the University of Minnesota recently completed a multi-replication, random assignment study where researchers tested the notion that high school students in a math-enhanced, CTE curriculum will develop a deeper and more sustained understanding of mathematical concepts than those students who participate in the traditional CTE curriculum, without affecting related technical skill development. Approximately 3,000 CTE students in eight states participated. The replications included business and marketing, auto technology, IT, health, and agriculture. Critical to this study was the theory-driven pedagogic model developed for the study and the intensive professional development provided to CTE-math teacher teams. Early findings from the study have shown positive gains in standardized measures of math achievement (Stone, Alfeld, Pearson, Lewis, & Jensen, 2005).

Education for Work

Education for jobs in the economy is a vital aspect of career and technical education. Although many argue that preparation for jobs should be concentrated primarily in the postsecondary phase of students’ lives (e.g., in community and technical colleges), many students are developmentally ready to prepare for occupations at earlier ages. If they are to prove beneficial to students, however, secondary CTE programs must provide rigorous academic development and rigorous career development. These programs must also be linked to postsecondary education and training opportunities. For most young people, secondary schools should provide high-quality career guidance and competence in

communication, numeracy, literacy, and computer abilities, all of which lead to more specific preparation at the postsecondary level.

To meet this goal, most of the traditional CTE areas need to more fully infuse new technologies—computerized diagnostics in auto repair, numerically controlled machines in machine shops, and sophisticated medical equipment in health occupations classes. For those changes to occur, staff will need professional development in the new technologies as well. High schools need to provide a more expansive academic and vocational curriculum premised on broad career clusters rather than on preparation for particular jobs. Such programs needed to become better linked to postsecondary occupational education, which, in turn, could provide greater specificity and more direct application to immediate employment. These programs could also point to further postsecondary education and workplace training opportunities over a lifetime.

CTE AS HIGH SCHOOL REFORM

The emergent secondary CTE programs that educate through, about, and for work will have the following features:

- a broader focus on all aspects of an industry as well as occupation-specific training where appropriate,
- attention to student achievement through some form of academic and vocational curriculum integration,
- strong linkages to workplaces while students are still in high school,
- learning activities that link experiences at those workplaces with school learning,
- smaller learning communities with a career focus to help engage students and keep them in school until graduation,
- connections to postsecondary institutions to encourage further education, and
- engagement of students in student organizations (CTSOs). A new study by the NRCCTE shows that participation in CTSOs increases student engagement in school (Alfeld, Stone, Hansen, Aragon, Zirkle, & Connors, forthcoming).

Academic and Vocational Curriculum Integration

The integration concept is not new in the vocational community; its proponents go back nearly a century to John Dewey (1916), who exhorted educators to contextualize learning in U.S. high schools. However, it took a more recent confluence of events to bring curriculum integration back into vogue primarily due to demands by the business community that high schools improve their preparation of students for the requirements of modern work.

The Secretary's Commission on Achieving Necessary Skills (SCANS) report (1991) supported the teaching of the required skills "in context." That support stemmed from a second event in the ascendance of curriculum integration: the emergence of research in

cognitive science suggesting that students learned better when learning was modeled after “real world” learning outside school (Brown, Collins, & Duguid, 1989).

Curriculum integration holds the promise of opportunity to change an entire high school. Teachers who collaborate with peers outside their discipline can provide students with engaging academic courses that are related to broader themes of adult life or careers. Pedagogy, too, can change, as academic courses presented students with applications of traditional bodies of knowledge and vocational teachers incorporated rigorous methods and deeper understanding of various technologies. Indeed, formal and informal tracks themselves could become obsolete, as students became oriented around career themes, regardless of their next step after high school (i.e., postsecondary education or work).

Strong Linkages to Workplaces

Cooperative, or co-op, education (Stone, 1995), school-based enterprises or SBE (Stern, Stone, Hopkins, McMillion, & Crain, 1994), and youth apprenticeships (Hamilton, 1990) are common ways of providing work-related learning. In co-op programs, students receive training in the context of a paid job. In SBEs, students are involved in either on-site or off-site work-related experiences such as running a store, producing goods or services for sale, or even building a house. Students enroll in related classes (e.g., business management or construction) and may decide how to re-invest the income generated by the enterprise, but usually they are not paid. In comparison with outside jobs, effective SBEs often provide more opportunities for students to perform a range of tasks and to work in teams. Through youth apprenticeships “schools provide integrated academic and vocational education that is linked to employer-provided paid work experience and training at a work site” (Corson & Silverberg, 1994, cited in Urquiola et al., 1997, p. 120).

Work-related experience programs such as these are beneficial in the lives of young people because most high school students want or need to work. The effects on students of part-time work of less than 20 hours per week can be positive (Stone & Mortimer, 1998; Warren, LePore, & Mare, 2001). In addition, when work-related experiences are coordinated with school learning, students have the opportunity to learn from and contribute to authentic achievements in a work setting.

An additional advantage of providing work-related experiences to students is that it can engage students who are at risk of dropping out (Pauly, Kopp, & Haimson, 1994). Programs that begin before grade 11 are more likely to succeed in keeping young people engaged in high school, because many students begin to disengage from school in the middle school years. Beginning a program in grade 9 or 10 provides students with longer preparation time, so that their work-related experiences can make substantive contributions to the workplace rather than being mere busywork or observation.

Smaller Learning Communities

Career academies have existed since the 1970s, but their focus shifted in the late 1980s from a dropout prevention strategy to a high school reorganization model that prepares all students for both work and postsecondary education (Kemple & Snipes, 2000). In a study of career academies, Kemple and Snipes reported a 15-fold increase in the number of such academies during the decade of the 1990s, with many more planned. Most career academies incorporate the main elements of the new vocationalism: a broad career focus, links to postsecondary education and business, and curriculum integration (Benson, 1997). Kemple and Snipes defined a career academy as a program that (a) is organized as a school within a school, where students stay with a group of teachers for a period of 3 or 4 years; (b) offers students both academic and vocational curriculums, usually integrated around a career theme; and (c) has established partnerships with businesses to build connections between school and work.

Career Pathways

Some high schools have reorganized their curriculum around clusters of occupations that share similar skills and knowledge, although they may differ in the length of education and training required (Pucel, 2001). These career pathways or majors replace the traditional college preparatory, vocational, and general tracks. For example, a cluster such as Engineering, Manufacturing, and Industrial Technology can provide students with a broad introduction to many occupations, such as machinist or engineer.

Career pathways form the context for integrated activities such as senior projects and other interdisciplinary activities. Career pathways are also intended to provide a rigorous, coherent program of study that includes high-level academics in addition to technology applications and work-based learning. Schools that choose to develop career pathways must have strong connections with business, industry, and institutions of postsecondary education; such connections enable the school to provide internships and other applied experiences for their students.

The Office of Vocational and Adult Education (U.S. Department of Education, 2002) has identified 16 career clusters that high schools can choose from, depending on local labor market opportunities. Some states have developed their own clusters. Many districts and a few states have mandated that high schools incorporate pathways into their curriculum. To date, no studies on the effects of career pathways have been conducted, but several are under way that will provide more information in the near future.

The evidence from these career-themed high school organizational structures suggests that academies, and pathways are possibly productive ways for secondary CTE to position itself for the future. The research base, while mixed, shows positive outcomes in many measures of high school achievement and in reducing the need for remediation at the postsecondary level. The elements of these structures are pedagogically and theoretically sound. One possible reason for success might be the focus on all students, not simply those not deemed “college material.” Another reason is that career academies,

and pathways restructure the school. In the best of cases, students feel that their teachers care, their peers care, and they all share a common interest and goal. These affective factors are likely to increase student engagement and can improve achievement as well. Such reforms may also affect students' perceptions of their life chances.

How much of the improvement in student outcomes is attributable to caring relationships and how much to CTE? This is a difficult question to answer, because the two are confounded in the best examples of these schools. The students are not the only ones involved in positive relationships. Teachers, too, have developed professional communities around career themes and have become responsible to each other. It is useful to recall students' reports to Crain et al. (1999) that they found their high school experience (in career themed high schools) useful in developing a career identity and in becoming proficient at something. Non-career-related high school reorganization along the lines of academies or magnets would be unlikely to produce this result (cf. Ready, Lee, & LoGerfo, 2000).

Connecting to Postsecondary

One of the more intriguing efforts of the early 1990s to connect young people to post high school technical education was called Tech Prep. Tech Prep represents a vertical integration of curriculum (different than the horizontal integration described earlier) that links the final two years of secondary education with the first two years of postsecondary education (or apprenticeships), leading to a degree or certificate. A common core of required proficiency in math, science, and communications is presented in the context of technical preparation in specified occupational fields, and job placement is often included.

The goal of Tech Prep is to attract students by eliminating repetition between high school and community college courses and by showing students a clear path to postsecondary education and technical occupations. Tech Prep also allows community colleges to teach the more advanced courses thought to be necessary for highly technical occupations, on the assumption that students had taken the foundation courses in high school.

Other efforts to encourage youth to continue their formal learning beyond high school include dual or concurrent credit by identifying or creating courses that carry both high school and college credit. The state of Washington has been a leader in this effort since the early 1990s. Some states have backed off these efforts, unable to negotiate the tricky finances of such arrangements. Another model is the middle college high school initially started as a strategy to keep high ability but high risk students in school. In this model, a high school was physically located on a community college campus putting youth into a more adult environment.

IMPLEMENTING THE NEW CTE

Elements of all of these reform efforts exist across the United States. In some schools, all are present and functioning. The challenge in any high school reform is bringing it to

scale. The following are four, modest recommendations for accomplishing this important task.

1. Make Connections

The first connection is within schools through collaboration across departments and especially with traditional academic areas. High school CTE teachers have a programmatic and arguably a moral obligation to ensure their students are adequately prepared to engage the world of work and the world of continuing education. This means their students must exit high school in command of basic skills and knowledge in math, science and communications. Ensuring this can only be accomplished by cross-disciplinary teams. It is essentially impossible for CTE teachers, regardless of how hard-working or well intended to improve basic skills and scores on their own. By contrast, whole schools, working in coordinated fashion, have an excellent chance of achieving this goal.

The high school programs must connect to their postsecondary counterparts. Students need to see clear pathways to continued occupational development. High school CTE teachers must work with community college instructors to coordinate curriculum, business partnerships, and even the joint use of labs or shops where appropriate.

The high school CTE must be connected to the world outside of school. If it is a health pathway, a health academy, or an LPN program, the school personnel and the programs must create and maintain deep connections with the occupational arena that provides the content and context for a meaningful education.

2. Provide Joint Professional Development

Most secondary school teachers, whether in CTE or the academic track, are not prepared to work with students on improving basic skills. Nor do many high school teachers have training in team teaching and the development of integrated curriculum. Opportunities for shared professional development need to be provided for both CTE and academic teachers. This is an excellent way to introduce faculty members to each other and to the many similar goals and challenges they face. Joint professional development also furthers cross-departmental communication and collaboration.

3. Provide Pre-Professional Training

Although joint professional development will help to address the immediate problem, an important component of the long-term solution lies in how we prepare teachers for the complex, integrated curriculum of reformed high schools. Teacher education programs are the first opportunity to create the ways of thinking necessary to make these reforms work. Building skills in team teaching, curriculum integration, and contextual teaching and learning will assure a future teacher workforce that will be capable of implementing these promising reforms.

4. Incorporate Career-Based Learning into More Secondary Schools

Academies, magnets, and pathways, as well as some of the reform designs reviewed here, provide students with opportunities for education through, about, and for work. Educators are learning to integrate careers with academic subjects as a hook to retain students in school, to improve their academic skills, and to help them make the transition to college. All schools should consider this means of helping students to meet the higher standards expected and to identify their own goals for adult life.

FINAL THOUGHT

While it is clear that today's labor market entices students with the promise of economic rewards for obtaining a college degree, not all high school students possess the crucial skills, abilities or desire to succeed in academic coursework at the college level. Not only are some students unlikely to profit from a college experience, but the belief that they can compensate for poor performance and lack of adequate preparation in high school by attending college may result in a failure to make the proper back-up plans and obtain the necessary training for entering a career (Rosenbaum, 2002). For the majority of all high school graduates who will not earn a college degree, unrealistic hopes can result in the needless wasting of valuable time and resources. A better strategy for this group of students is to receive training and preparation during high school for entrance into careers with decent wages and opportunities for advancement, a role for work-based education.

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