

**Human Resource Development and Career and Technical
Education in American Community Colleges**

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Abstract

With their open access admission policies, low tuition costs, and convenient locations, community colleges are designed to make college accessible to all. They strive to meet three main goals. The first is to teach marketable vocational skills, the second is to provide the first two years of a four-year bachelor's degree program, and the third is to provide continuing education and enrichment for community residents. This paper covers issues that are relevant to the community college mission of helping prepare a skilled workforce for jobs offering reasonable wages. After providing an overview about community colleges and their students, the paper discusses the types of remedial education programs that are most likely to provide the large number of underprepared students enrolled in community colleges with the skills to advance to college-level courses. It considers the growing phenomenon of dual enrollment that enables students to earn both high school and college credit for courses while still in high school. It addresses the ways that community colleges can support local labor markets and regional economic development and their efforts to build career pathways for workers. It describes the growing role of community colleges in online education, and it reviews the financing of community colleges. The paper also discusses issues related to community college persistence and completion, and it cites evidence of the market value of the education and credentials the colleges provide. Finally, it considers the usefulness of the American community college as a model for other countries seeking to develop institutions that serve similar functions.

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Introduction

The number of two-year public colleges in the United States grew rapidly beginning in the 1960s. Today, about a thousand community colleges are found in close proximity to most residential areas throughout the country. The colleges are designed to provide education for all. Because of their open access admission policies and low tuition costs, community colleges attract a higher proportion of low-income and minority students than four-year institutions. Community colleges aim to meet three main goals. The first is to teach marketable vocational skills, the second is to provide the first two years of a four-year bachelor's degree program, and the third is to provide continuing education and enrichment for community residents.

In this paper, we discuss a range of issues that are all relevant to the community college mission of helping prepare a skilled workforce for jobs offering reasonable wages. First, we provide an overview about the development of community colleges and their distinctive features and roles. We also provide information on the characteristics of students attending the colleges. Next we discuss the large number of underprepared students and what colleges are doing to address this problem. We then consider the growing phenomenon of dual enrollment, whereby students earn both high school and college credit for a course while still in high school, and in which community colleges are playing a major role. Next we address the role of community colleges in local labor markets and regional economic development, and the colleges' efforts to build career pathways for workers. We discuss the fairly new education delivery method of online education, which may be beneficial for students with limited ability to attend classes in person. We also review the financing of community colleges. We then consider issues surrounding persistence and completion in these institutions, and we cite evidence on the market value of the education and credentials they provide. Finally, we discuss the usefulness of the American community college as a model for other countries developing institutions that serve similar functions.

The Growth of Community Colleges and Their Multiple Missions

The first community college, Joliet Junior College in Illinois, was founded in 1901, but the community college movement in the United States did not gain momentum until much later. After World War II, the U.S. adopted the goal of making college accessible to all Americans at a relatively low cost, and beginning in the 1960s American higher education expanded greatly. The U.S. distinguished itself from many other countries where higher education remained largely an elite phenomenon. The number of community colleges doubled in the 1960s and continued to increase in the 1970s and 1980s. Only in recent decades have a large number of countries come to realize the social and economic advantages of providing higher education to a larger share of their populations.

Decentralized, virtually all higher education in the U.S. is made available by either the states, private (either non-profit or for-profit) entities, or, less frequently, (usually large) local units of government. Most of the nation's higher education expansion of the 1960s involved new campuses for four-year state colleges and universities and the creation of new community colleges. Since the turn of the twenty-first century, community colleges have taken on an even more prominent role in U.S. education policy.

Researchers, educators, and policymakers have become increasingly aware that while the country has made great strides in opening access to college for the majority of young people, many do not complete a degree or earn a postsecondary award (Bound, Lovenheim, & Turner, 2007). Thus, President Barack Obama has noted that the United States no longer leads the world in the share of its young adult population with some college-level credential. In order to regain the lead, and to strengthen the educational base of the country in general, the President has called on the community college system to graduate an additional five million students by 2020.

Overwhelmingly, U.S. community colleges offer associate degrees as their most advanced degree, although a few have started to offer bachelor's degrees as well. According to the *Digest of Education Statistics 2008* (U.S. Department of Education, 2008a), the colleges annually confer about 700,000 associate degrees, which usually

require two years of full-time study. They also grant about 400,000 shorter-term credentials, known as certificates.

In 2008, there were about 6.7 million students enrolled in degree-granting programs at over 1,000 community colleges in the U.S., representing about 44 percent of all undergraduates enrolled over the course of the year in colleges and universities (American Association of Community Colleges [AACCC], 2010). Significantly, low-income, first-generation, and immigrant college students are all overrepresented in community colleges with respect to their enrollment in higher education.

Generally, a community college is the lowest cost higher education option in the area where it operates, and it tends to serve mainly local students. As the name “community college” implies, these institutions are designed to provide more than a college education to traditional-age students. Indeed, they offer a variety of educational and cultural services to the communities in which they are located.

Thus the community college has traditionally undertaken several missions, which sometimes complement each other and sometimes compete for attention. One role might be broadly thought of as vocational: training workers in practical occupations. Some of the occupations are blue collar (for example, welding), others are white collar (for example, business bookkeeping). Often students in a vocational program will earn a certificate or a two-year associate degree in their occupational major. Community colleges also often take a leading role in retraining workers. For example, a community college in Michigan may enroll a laid-off auto worker and retrain him or her as a medical technologist. The certificates granted by community colleges are usually in occupational areas. Over the last 10 or 15 years, community colleges have become particularly important in training health and medical workers. For example, almost two thirds of registered nurses receive their nursing degrees from community colleges (AACCC, 2010).

Community colleges play another important role in providing the first two years of a college education for students who plan to transfer to a four-year college and complete a bachelor’s degree. These students often take traditional academic subjects, such as mathematics, history, or economics. Increasingly, however, many students in occupational courses, such as nursing or computer science, also plan to transfer and earn a bachelor’s degree in those areas. For example, a recent internal (unpublished) survey of

information technology students at Macomb Community College in Michigan found that 89 percent wanted to go on and obtain a bachelor's degree. The U.S. Bureau of Labor Statistics' Occupational Outlook Handbook's entry on registered nurses writes that "many RNs [registered nurses] with an ADN [associate degree in nursing] or diploma later enter bachelor's degree programs to prepare for a broader scope of nursing practice" (Bureau of Labor Statistics, 2009). (Note that ADN-level nurses are trained at community colleges, while bachelor's-level nurses are trained in four-year colleges or universities; nurses who earn a diploma are trained directly in hospitals.) During recessions and economic downturns, community colleges become increasingly attractive as a relatively low-cost route to the four-year degree for the student who is able to persist and transfer.

A third role that community colleges play is providing continuing education and enrichment to the residents of their communities. For example, a computer programmer may attend a community college to learn about a new technology, or a community member may take art or French for enrichment. A nurse may enroll in a course to fulfill a continuing education requirement needed to maintain his or her licensing. Many of these courses are noncredit and can comprise a substantial share of the activity at a college as well as a significant source of income for the institution. Thus, in addition to the approximately seven million credit students, community colleges enroll about five million noncredit students (AACC, 2010).

Noncredit courses do not count toward a degree or certificate. It is important to note that some of these courses are targeted toward industry certifications, which many workers find useful for career development. Certifications are obtained by passing an examination rather than simply by successfully completing a set of courses, and they are particularly common in the information technology and healthcare fields (Van Noy, Jacobs, Korey, Bailey, & Hughes, 2008).

An important overarching goal of community colleges is to provide "open-door" access to college for low-income, immigrant, and first-generation college students. The average tuition in 2007 was about \$2,500 a year, less than half the average tuition for public four-year institutions (AACC, 2010). Many studies have shown that lower tuition increases college enrollment (Long, 2008). Proximity also promotes access. Many states have therefore tried to situate their community colleges so that the large majority of their

residents lives within commuting distance of at least one of the colleges. Community colleges also offer classes at night and during the weekends to accommodate the schedules of working students. And, as we shall see below, the colleges even welcome students with academic skills so weak that the students are judged to be inadequately prepared for college. Rather than turn these students away, community colleges provide extensive remediation services to give them the chance to strengthen their skills sufficiently to allow them to take and benefit from college-level courses.

Characteristics of Community College Students

A “traditional” college student is one who attends college full time and immediately after completing high school. By this definition, the majority of community college students are not traditional. Over 60 percent of the credit students in community colleges are enrolled part time, and most community college students work. Of the part-time students, half work full time, and a third work part time. Of the full-time students, 27 percent work full time, and half work part time. The colleges enroll many adult students; thus, the average age of a community college student is 29, although a large fraction — 43 percent — are age 21 or younger. Sixteen percent are age 40 or older. Most (60 percent) are women; 35 percent are minorities, and 39 percent are members of the first generation in their family to attend college (AACC, 2010).

The U.S. Department of Education (2008b) carried out an analysis of the educational trajectory of students who were high school seniors in the spring of 2004. Almost all graduated from high school, and 63 percent enrolled in a postsecondary institution in fall 2004. Of these immediate enrollees, 30 percent enrolled in a community college.

Asian/Pacific Islanders and Whites were more likely to enroll than Blacks, Hispanics, or American Indians/Alaska Natives; however, among those who enrolled, only Hispanics enrolled in community colleges at a significantly higher rate than members of other ethnic groups, at 46 percent. The corresponding figures were 25

percent for Asian/Pacific Islanders, 28 percent for Whites, 30 percent for Blacks, and 24 percent for students of more than one race/ethnicity.

Family income, or more broadly socioeconomic status (SES), was strongly associated with immediate enrollment: 82 percent of students from families in the highest quartile of SES enrolled in the fall, compared with 42 percent of those in the lowest quartile.¹ Among individuals who did enroll, 17 percent of those from the highest quartile enrolled in a community college and 44 percent from the lowest quartile did so. More generally, lower SES students are much more likely to enroll in a community college than a four-year institution.

Bailey and Morest (2006), using data from the National Postsecondary Student Aid Study (U.S. Department of Education, 2004), found that 63.5 percent of undergraduates in community colleges had an income below \$50,000, compared with 51.7 percent in public four-year institutions and 49.9 percent in private, four-year, not-for-profit institutions.² However, despite their lower incomes, community college students were actually less likely to access Pell Grants (federal financial aid grants targeted at low-income students) than students at four-year public schools; 22.6 percent of low-income undergraduate community college students did so, compared with 25.7 percent in public four-year schools and 27.1 percent in private, four-year, not-for-profit institutions. This difference may exist because many community college students attend part time, and part-time students are less likely to be eligible for financial aid. But it may also exist because the students attending four-year institutions may be better informed about their eligibility for financial aid and may obtain more assistance in navigating the complicated financial aid application process. (Long [2008] reviews many of the policy issues surrounding financial aid.)

Bailey and Morest (2006) also found that community college undergraduates were older. Over one third (34.8 percent) were age 30 years or older, compared with only 13.4 percent at public four-year colleges and 20.9 percent at private, four-year, not-for profit colleges. Community college students were also more likely to have dependent children:

¹ The U.S. Department of Education uses a definition of SES which is a composite of parental education, occupations, and income.

² For dependent students, incomes cited were parental incomes; for independent students, incomes were their own.

32.5 percent compared with 13.2 percent at the public schools and 18.3 percent at the private schools.

Developmental Education for Underprepared Students: Traditional Practices and Innovative Reforms

Many community college students enter college unready for college-level work. On average, they are less well prepared than their counterparts in four-year schools and more likely to come from low-income households (Perin & Charron, 2006).

As a result, the colleges find themselves in the position of offering many remedial courses (often called “developmental education” courses). Typically, a student entering a community college needs to present test scores that indicate readiness for college-level coursework in mathematics and English. Students who do not present a score must take an assessment test. Different colleges and states use many different tests. Students whose scores on those tests fall below a cut-off score — which varies from state to state and from institution to institution — are referred to one or more developmental education course. Often there are several levels of developmental courses in each subject (math, reading, and writing), and the level of placement depends on the student’s test score and, in some cases, the discretion of a counselor, professor, or administrator.

What is the extent of developmental education? Attewell, Lavin, Domina, and Levey (2006) found that, among a sample of students drawn from the National Education Longitudinal Study of 1988 who were in eighth grade in 1988 and were followed until 2000, 58 percent of students that enrolled in two-year colleges took at least one developmental course, 44 percent took between one and three developmental courses, and 14 percent took more than three such courses. At non-selective four-year colleges, 31 percent of students took a remedial class; at selective colleges, 14 percent did so; and at highly-selective institutions, only 2 percent did so.

Looking at a sample of 57 colleges participating in the “Achieving the Dream” initiative³ funded by Lumina Foundation and others, Bailey (2009) found that 59 percent of students enrolled in these colleges took at least one developmental course. These figures underestimate the extent to which students enter community college with weak academic skills, since many students who are referred to remediation do not enroll in it, either because the remediation is not required for at least some college-level courses or because they are discouraged and simply leave the college without enrolling in any courses..

Developmental education is controversial (see Bailey [2009]). Policymakers who argue that students should have been prepared for college-level work in high school balk at “paying for the same instruction twice.” Many students referred to remediation are high school graduates who are surprised and discouraged when told that they are not eligible to take college-level courses. Developmental courses require time and money on the part of students, and in some cases students use up financial aid eligibility on developmental courses that do not give them credit toward graduation. Students therefore try to avoid remediation, often with the collaboration of their professors, but advocates argue that colleges must provide some services to students who arrive with weak academic skills. Otherwise, given the many recent high school graduates, immigrants, and adults who have been out of school for years who arrive at community colleges with weak academic skills, the promise to provide open access to college would have little meaning.

The evidence on the effectiveness of developmental education is mixed at best. Bettinger and Long (2005), using data from Ohio, found that students who enrolled in math developmental courses were likely to accumulate more credits than similar students who went directly to college-level courses, and they were more likely to transfer to a four-year college. Conversely, using Texas data, Martorell and McFarlin (2007) found weak evidence of an improvement in college-level math grades for those who took developmental math, but found no effect on the chances of passing college-level math, transferring to a four-year college, or completing a degree. Calcagno (2007) and

³ For information on the Achieving the Dream initiative, see its website at <http://www.achievingthedream.org>.

Calcagno and Long (2008), using data from Florida, found that remedial math students were more likely to persist to the next year. However, they found that taking remedial courses had no positive effect on passing college-level math or English classes, on completing a degree, or on transferring to a four-year school.

In all of these studies, the authors used quasi-experimental methodologies and asked whether similar students with weak skills do better if they take one or more developmental education course or if they go directly into college-level courses. But it should be noted that these discouraging results are most relevant for the stronger students within the group referred to remediation. We know much less about the effects on students who arrive with very weak skills, such as skills equivalent to those possessed by the average middle school student.

One reason that remediation may not work well is the failure of many students to complete their developmental sequences. Less than 40 percent of students referred to developmental education complete the course or sequence of courses to which they are referred within three years. The more courses that a student requires to raise his or her skills to college level, the less likely the student is to complete the sequence (Bailey, Jeong, & Cho, 2008).

Consequently, developmental education has two opposing effects: it delays and discourages students, but it may teach them material that they need to be able to take advantage of college-level instruction. Even if remediation to some extent strengthens academic skills, the delays and discouragement that it causes may outweigh that positive effect.

Over the last decade, community college educators have worked hard to strengthen developmental education and generally improve outcomes for students who arrive at college with weak skills. One of the most popular innovations is referred to as “learning communities,” where students are grouped in cohorts and move through a fixed set of courses together. Developmental courses are taught in conjunction with regular, college-level subject matter courses. This arrangement has the potential to increase students’ interest level and thereby their motivation and learning. Often learning communities include “student success” courses designed to help students adapt to college life and succeed in school. Zeidenberg, Jenkins, and Calcagno (2007), using

administrative data from Florida, found that participation in such courses was associated with better student outcomes. Further, using a random assignment methodology, a recent rigorous evaluation of the learning communities model by the research organization MDRC found some encouraging outcomes: program participants were moved more quickly through remedial English requirements; some educational outcomes were higher for program than control students, although the effects diminished over time; and program students reported higher levels of integration and engagement with the college than control students (Scrivener, Bloom, LeBlanc, Paxton, Rouse, & Sommo, 2008).

Given the delays caused by remediation and the generally discouraging results from empirical studies of its effectiveness, Bailey (2009) suggests several approaches to help students pass quickly into college-level work rather than spend much time in developmental courses. He recommends taking a more nuanced approach to assessment, recognizing that two students with the same score on a placement test may have very different needs, as one student may never have learned some material, while another might just need a refresher. It may be effective to open up college-level courses to many developmental students, giving them supports where needed to help them succeed. For students with weak skills, it is important to work to minimize the time that they spend in developmental courses, possibly by compressing the time in which the courses are taught or by contextualizing them — linking them with subject matter material in order to motivate students and make the developmental material more relevant. Learning communities that link developmental courses to college-level courses are being used to pursue this goal.

The Community College Role in Improving High Schools and Preparing Students for College

We have pointed out that many remedial students in community colleges are high school graduates. To some extent, therefore, the need for remediation in community colleges arises from the failure of the U.S. high school system to adequately prepare its

graduates for college. Even with a much strengthened kindergarten to high school (K-12) system, the need for remediation will remain because many community college students are adults who have been out of school for many years or immigrants who were educated in their home countries. Nevertheless, an improved K-12 system would greatly ease the developmental burden at the postsecondary level and community colleges are increasingly participating in improving the pipeline that prepares students for college and helps them transition into college.

One serious problem is that the K-12 and higher education systems in the U.S. are not well-coordinated. They have different systems of governance and funding, and contrasting internal cultures and human resource systems. The basic structures and methods of higher education evolved during a historical era when a small, relatively privileged portion of the population attended college. The higher education system has never adjusted to the current reality that the large majority of young people enroll in some form of postsecondary education.

As a result of this lack of coordination, many high school students do not have a good sense of what will be required of them in college, and successful high school completion, as we have seen, does not guarantee that students are academically prepared for college.

Policymakers and educators have been developing a variety of initiatives designed to improve the coordination between the secondary and postsecondary systems, to align high school completion and college enrollment standards, and to help high school students understand what will be expected of them in college. Improving this coordination and making high school more rigorous may help in preparing students for college and reducing the need for developmental work.

One increasingly popular strategy for improving preparation for college is referred to as “dual enrollment.” Dual enrollment students take college courses while they are still in high school as part of a coordinated relationship between the high school and the college offering the course. The student may get both high school and college credit (“dual credit”) or just college credit; often, tuition is covered by the school district.

Dual enrollment advocates argue that the strategy has several potential advantages. First, the programs may decrease the time-to-degree for some students

because they start college having already accumulated some credits. This not only saves time but also reduces students' tuition costs. Dual enrollment, like other college-in-high-school strategies, such as Advanced Placement courses, makes high school more academically challenging. Dual enrollment and advanced placement clearly have benefits for strong students, but educators are also working to enroll a broader range of students. Advocates believe that the programs may be able to improve the performance of previously low achieving students by exposing them to interesting college-level material, setting high academic expectations, and providing appropriate academic support. Moreover, dual enrollment gives students a much more realistic sense of what will be expected of them in college, thereby avoiding culture shock and discouragement when students arrive in college and realize that they are not adequately prepared. Initial research on the impact of dual enrollment on postsecondary outcomes is encouraging (Karp, Calcagno, Hughes, Jeong, & Bailey, 2007).

In the 2002-03 academic year (12 months), 11,700 public high schools, or 71 percent of those schools, offered dual-credit courses (Waits, Selzer, & Lewis, 2005). In that same year, Kleiner and Lewis (2005) found that 48 percent of postsecondary institutions operated dual enrollment programs. Almost all community colleges (93 percent) operated them, while 64 percent of public four-year colleges and universities did so. Private colleges had the programs at lower rates.

In that academic year, 679,500 high school students took college courses through dual enrollment, and an additional 133,100 took college courses on their own. Of the dual enrollment students, most — 516,900 — were at a community college. Thus, at the time of the survey, chances were high that students taking a college course while in high school were doing so through a dual enrollment arrangement with a community college. Community colleges may be so dominant because they are relatively inexpensive compared with other institutions of all types and there is likely to be a community college close to a high school.

While more recent national data are unavailable, our review of selected locations around the country indicates that the number of high school students participating in dual enrollment programs is growing. Participation in the City University of New York's "College Now" dual enrollment program increased 70 percent between 2001 and 2004. In

Texas, the share of high school students taking dual enrollment courses rose from 4.8 percent in 1990-91 to 15.6 percent in 2001-02. In Florida, the number of dual enrollment students increased from about 28,000 in 1988-89 to about 34,000 in 2002-03 (Karp et al., 2007). In Washington State, dual enrollments have increased steadily in recent years, from about 11,000 in 1997-98 to about 17,000 in 2007-08 (Washington State Board for Community and Technical Colleges, 2009).

The financing sources for dual enrollment courses are diverse. In the Kleiner and Lewis (2005) survey covering the 2002-03 academic year, 64 percent of the postsecondary institutions offering dual enrollment programs reported that parents and students were a source of funding for the courses they take; 38 percent indicated that they themselves (the college or university), through grants or tuition waivers, were a source; 37 percent said that the high school or the public school district was a source of funding; and 26 percent said that their state was a source. Community colleges were less likely to report parental or student funding as a source than the other respondents to the survey.

As we have argued, dual enrollment can save money by promoting acceleration. For example, in 2007-08, Washington State reported that its “Running Start” dual enrollment program saved substantial sums. For students and their parents, \$36.4 million was saved; for the state, \$46.9 million (Washington State Board for Community and Technical Colleges, 2009).

Therefore, dual enrollment is an ambitious and forward looking program. Its potential to improve preparation for college and increase college success is based on the premise that if educators set high expectations and provide students with support, the students will work hard to meet the expectations and realize the economic and academic benefits of getting a head start on higher education by taking college courses in high school. Moreover, by promoting collaboration between colleges and high schools, dual enrollment works to overcome the misalignment and lack of communication between the two systems. As a result of the enthusiasm about dual enrollment, it is growing rapidly and its growth is supported by some encouraging preliminary evidence. As it continues to grow, more analysis will be needed to measure its potential effects and to understand the conditions under which it does or does not improve student outcomes.

The Community College Role in Preparing Students for Local Labor Market Participation

Workforce preparation is one of the most important missions of community colleges, and college administrators and faculty are proud of their role in promoting local economic development. The particular community college workforce development role depends very much on the nature of the local economy as local labor market conditions vary significantly. Community colleges need to have detailed knowledge of their local labor market and the needs of local employers in order to harmonize their vocational curriculum with the labor market. In order to respond effectively to local economic conditions, community colleges need a continually updated profile of, most critically, employment by industry, and also information about which industries and occupations are growing and shrinking, and wages by occupation.

Unfortunately, most community colleges do not have the research capacity for conducting such a regional economic analysis, which can be a sophisticated, time-consuming endeavor. However, several consulting firms offer information about regional economies at a price, and the state and federal governments also track information on industrial and occupational composition and wage. Some consulting firms have developed complex input-output models of regional economies. If a new firm is expected to generate employment in a particular sector; the models indicate what the impact will be on employment in all other sectors and therefore allow for planning that takes the new composition of employment as a starting point (Hewings, 1996). Still, community colleges must dedicate staff capacity in order to make use of this information.

Since most community college students remain in the local labor market after they leave college, maintaining contact with the network of graduates and other former students is another way for colleges to gather information on local labor market needs. In addition, graduates can help provide access to the firms where they work for other graduates and subsequent students. Graduates can be tracked in two ways: through surveys undertaken by the college and through the use of state administrative data

collected for the purposes of unemployment insurance, which track workers over time, recording their quarterly earnings, hours worked, and industry of employment. The advantage of a survey is that the information collected may be more complete and deal with subjective topics like satisfaction with the college; the advantage of the administrative data is that they cover the universe of all former students who still live in the state (MacAllum & Yoder, 2004).

In the end, the community colleges that maintain the best relationships with local employers will be the most successful at matching their workforce development programs to the needs of the local labor market. The colleges that are most effective are those that establish themselves as players on the local economic development scene and are deeply embedded in their economies as providers of skilled workers and as providers of customized training to employers (MacAllum & Yoder, 2004).

It is for this reason that MacAllum and Yoder (2004), in their report, *The 21st-Century Community College: A Strategic Guide to Maximizing Labor Market Responsiveness*, advocate that community colleges build strategic partnerships with local industry in order for local workers, industry, the region, and the college to all thrive, since they are interdependent. But community colleges rarely have large staffs, or even small staffs, devoted to maintaining relationships with local employers. In many cases, therefore, relationships are based on informal contacts between individual administrators and, in particular, between faculty and local employers. In the absence of staff with an explicit outreach function, colleges may encourage individual initiative of this type. Furthermore, strategic use of part-time faculty who are working in the local labor market, and using a hiring process that seeks full-time faculty with links to local employers, are important components of efforts to improve the workforce development function of the colleges.

MacAllum and Yoder (2004) describe some successful partnerships. For example, Scott Community College in Iowa conducted a survey of local manufacturing employers and found that they were concerned about developing and retaining a skilled workforce. As a result, the college built a Manufacturing Technology Center with help from the state and ten of these employers and set up a process to recruit students for the Center from area high schools. Springfield Technical College, in Springfield, Massachusetts,

developed a Technology Park in a renovated mill, hosting technology-based and light manufacturing firms. Eleven colleges are involved in a program located in the Park that trains Verizon workers in telecommunications technologies. Lastly, the National Workforce Center for Emerging Technologies (NWCET) at Bellevue Community College in Bellevue, Washington, working with Boeing and Microsoft, has developed standards for training in information technology and provides faculty training in information technology.

The federal government also has supported efforts to improve the technical education provided by community colleges to meet the needs of the labor market. For example, the National Science Foundation (NSF) has developed the Advanced Technological Education (ATE) program (NSF, 2008). This program, which focuses on the development of technicians for high-technology industries, is one of the federal government's responses to the complaint by business that there is not a sufficient supply of mid-level technicians required to assure economic development based on the use of advanced technology. ATE is particularly focused on community colleges. According to NSF's program announcement, the ATE program supports "curriculum development, professional development of college faculty and secondary school teachers," and "career pathways to two-year colleges from secondary schools and from two-year colleges to four-year institutions." Thus the ATE program seeks to ensure quality instruction and possibilities for career advancement for technicians that work with advanced technology in fields such as biotechnology and electronics.

Another way that community colleges can help strengthen the local economy is to prepare students to become entrepreneurs. Many workers in today's economy are self-employed. Community colleges play two roles here: they provide training in the specific skills that workers use in their businesses (e.g., home inspection or web page design), and they provide business education. Business education is one of the most popular areas of study at both two- and four-year institutions. Its popularity is due in part to the facts that business knowledge is highly valuable in most jobs and many Americans are interested in becoming entrepreneurs; Rosenfeld and Pages (2007) cite the finding that six out of ten Americans are interested in starting a business.

Rosenfeld and Pages (2007), in discussing the many business and entrepreneurship programs at community colleges, offer the following two examples. At Kingsborough Community College, in Brooklyn, New York, there is an Institute for Virtual Enterprise where students learn about running businesses through simulation. Johnson County Community College in Overland Park, Kansas, offers an associate degree in entrepreneurship and operates a Small Business Development Center. Colleges often try to find instructors who have themselves been entrepreneurs.

Career Pathways for Youth and Adult Workers

As we have argued, community colleges play a crucial role in developing the local labor force. Many of the students interested in learning job skills, and who are needed to expand the skilled labor force, are adults. Often already having families and jobs, they are not able to attend college full time and even have to withdraw for periods of time to meet their other responsibilities. In order to accommodate such students, and to further strengthen their relationships to local employers, community colleges have developed strategies referred to as “career pathways.”

Jenkins and Spence (2006) define career pathways as “a series of connected education and training programs and support services that enable individuals to secure employment within a specific industry or occupational sector, and to advance over time to successively higher levels of education and employment in that sector.” They further state: “Each step on a career pathway is designed explicitly to prepare for the next level of employment and education.” Thus career pathways can combine periods of education with periods of progressively more skilled work that can alternate and/or overlap. Note that the career pathways model should not be held distinct from the labor market and economic development efforts of the college, but ought to be integrated with them.

Many community colleges and community college systems are adopting or have been influenced by the career pathways model. Jenkins and Spence (2006) identify the

following components of a complete career pathways strategy: reliance on detailed data about the local labor market; generation and use of “road maps” that show the linkages between education and training and job opportunities; clear articulation between developmental, vocational, and academic programs; work competency-based curricular development; an emphasis on “learning by doing”; flexibility that meets the student’s need for courses at convenient times and places; the ability for the student to step out of the program temporarily; the availability of support services, such as tutoring and counseling; programs that teach basic skills, communication skills, and so-called “soft skills” (interpersonal, organizational, etc.) that help workers succeed in the workplace; and articulation with all available public and private funding sources.

In order for career pathways to succeed, it is critical for community colleges to work closely with employers. The cooperation of employers is most likely to be secured if they find that pathway programs are in their interest: the programs provide a pipeline of skilled workers that they would otherwise have difficulty recruiting. In many local labor markets, employers often complain that it is difficult to find and retain skilled workers, since generally the more skilled a worker is, the more options he or she has (Jenkins & Spence, 2006).

The authors cite some examples of successful adoption of the career pathways strategy. For instance, Ivy Tech Community College, in Columbus, Indiana, completed an inventory of the workforce needs of local employers and as a result targeted healthcare as an industry. The college created a healthcare career pathway in partnership with area high schools and a local university, Indiana University-Purdue University Columbus (IUPUC), initially focusing on preparing technicians to sterilize surgical equipment, as employers expressed a need in this area. Ivy Tech’s program has now expanded to multiple partnerships and pathways in the medical field, some of which lead to baccalaureate-level credentials and ultimately to an even higher level if the student chooses to take this path.

To sum up, we have seen that community colleges can play a key role in workforce and economic development, but to do this successfully they need to meet several conditions. First they have to understand the local labor market, which can be accomplished through formal analysis of the regional economy, but many colleges do not

have the staff to do this effectively. Even if they have the resources to carry out such an analysis, colleges must have extensive informal relationships with their local employers. These relationships provide detailed and nuanced information on labor market needs, give colleges access to skilled workers who can serve as part-time instructors, and help colleges place their graduates. Finally, colleges must design their programs so that they serve the needs of a wide variety of students. Certainly there are traditional-age students in community college occupational programs, but a traditional full-time semester-based structure will not accommodate the schedules of many students who could potentially provide skilled labor to the local economy. Thus, a willingness to develop informal relationships and to move beyond traditional “collegiate” schedules and procedures are crucial factors in a successful workforce development function for community colleges.

Online Instruction

Online instruction has become a popular mode of delivery for courses at almost all institutions in the U.S., including community colleges, and it has been growing quite rapidly. According to Allen and Seaman (2008), the annual rate of increase in online course enrollments is 12.9 percent, greatly exceeding the 1.2 percent annual growth of students enrolled in all of higher education. In fall 2007, over 20 percent of students in colleges and universities were taking at least one online course.

Since community colleges serve a population that is more likely to be working, and to be older, flexibility in the time when courses are offered is important, and online instruction offers the ultimate in such flexibility. However, to the extent that online learning requires students to be more organized and motivated, it may not be as effective for the many community college students who arrive with weak academic skills.

According to the American Association of Community Colleges (2008), 92 percent of community colleges offer at least one online course, and 41 percent offer degree programs provided entirely online. Community colleges are the leaders in online education; according to Allen and Seaman (2008), slightly over half of all enrollments in

online courses are through associate degree-level institutions. Allan and Seaman also find that community colleges take the lead in offering online courses in the subject areas of psychology, social sciences, and the liberal arts.

Community colleges primarily deliver courses through three modes: traditional classroom courses, online courses, and “hybrid” or “blended” courses that combine the first two types. A recent survey (Instructional Technology Council, 2009), which received responses from 139 out of 500 community colleges contacted, found that 72 percent offered online classes and 14 percent offered blended courses. Other delivery modes, such as video instruction, are relatively rare.

Through interviews with faculty and administrators, Cox (2006) examined approaches to online instruction at 15 community colleges, selected to be representative of the population of community colleges in the U.S. Given the popularity and high growth rate of online instruction, community college staff interviewed by Cox felt that they had no choice but to expand online offerings or their colleges’ enrollments would be adversely affected. Given that geographical constraints are reduced when students search for online instruction (although a local institution with which they are familiar may have some edge), the competitive environment is very intense. Community college administrators were also fearful that their colleges could be eclipsed by well-known companies that were increasing their presence in the online arena, such as Capella University or the University of Phoenix.

Cox (2006) observes that in many cases the marketing materials found on community college websites and elsewhere tended to exaggerate the size of the relatively modest online programs offerings at the college. There was substantial variation in the level of offerings among the colleges studied. Not all colleges were able to put together all the ingredients needed to offer a significant number of online courses. Further, there was some faculty resistance to creating online courses; some protested that online courses involved higher workloads for the same pay, and there was a perception that the institution was interested in developing online offerings not only for the usual reasons of access and competitiveness, but also as a cost-saving measure.

Cox (2006) raises the possibility that the rapid growth of online instruction may conflict with community colleges’ goal of delivering education to everyone, regardless of

socioeconomic or demographic status. Online education may be more accessible to those students who are more prepared to begin with and who are more computer literate. There is evidence that dropout rates for online courses are higher than for traditional courses: Cox reports that an online education coordinator at one college said that completion rates within the distance education program were 15 percent lower than for traditional programs; another college reported a 52 percent completion rate for distance education and a 71 percent rate for conventional courses. Cox also found that colleges were not taking advantage of the new technology to rethink their pedagogy, but were more likely to simply use the Internet as a vehicle for presenting the types of materials that they typically used in regular classes.

Despite ongoing questions and controversy, online instruction is growing rapidly, albeit with great variations across campuses in the quantity and quality of classes and instruction. While, overall, online instruction so far has not lived up to early predictions of significantly reduced cost and increased effectiveness, innovations continue. Technology, and the Internet in particular, has been used most widely in hybrid courses. In fact, at many campuses most “traditional” classes now have an online component, offering the ability to contact the instructor by email, view a course web page, etc. The flexibility and power of technology will continue to grow, and the asynchronous character of online instruction will also continue to be attractive for many community college students with complicated work schedules and competing demands. The future is likely to be characterized by a combination of traditional classroom teaching, technology enhanced face-to-face instruction, and steadily growing online offerings.

Financing Community Colleges

Community colleges are public institutions governed ultimately by elected officials, often through appointed boards or agencies. Their revenue comes from a combination of sources: tuition and fees, state funding, local funds (including allocations from city and county governments), federal funds, and gifts and grants. It is difficult to

generalize about community college finance since funding and governance systems vary significantly by state. Some states, such as Washington, have no local funding, while others, such as Wisconsin, rely much more on revenue from local or county governments than from the state government. Tuition also varies widely by state. For example, tuition at the Community College of Vermont (2010) was \$199 per credit in fall 2009, while in spring 2009 tuition at California Community Colleges was \$20 per credit (although the 2009 fiscal crisis in California led to proposals to raise that amount by a third). Generally, states try to keep community college tuition and fees low to promote college access; therefore, compared with other sectors of higher education, community colleges rely less on tuition and more on public appropriations, especially state appropriations. According to the *Digest of Education Statistics 2008* (U.S. Department of Education, 2008a), in 2005-06 two-year public institutions received, on average, about 17 percent of their revenues from tuition and fees, about 11 percent from federal grants, about 30 percent from state appropriations, about 18 percent from local appropriations, with the remainder from other sources.

On average, community colleges receive less funding per student than public four-year institutions, and consequently spend less per student. In 2006, discounting expenditures on research and auxiliary enterprises, public community colleges spent \$10,350 per full-time-equivalent student. The corresponding figure for public master's level-institutions was \$12,715, and for research universities, \$19,114 (Wellman, Desrochers, Leniham, Kirshstein, Hurlburt, & Honegger, 2009). Thus, community colleges receive less funding per full-time-equivalent student, yet their students face greater financial, social, and academic barriers than typical students in other types of colleges. Moreover, since most community college students attend part time, each "full-time-equivalent" at a community college represents more actual students, many of whom need as much help and counseling as full-time students. Greater dependence on state revenues have also made colleges particularly vulnerable to severely shrinking state and local revenues caused by the two recessions of the last decade, particularly the recession in 2008 and 2009. Moreover, reflecting a long-term vulnerability, over the last three or four decades, states have been reducing the share of their funding that goes to higher education (Kane & Orszag, 2003).

In addition to reducing revenue as a result of restricted state subsidies, recessions usually lead to greater demand by students for places at community colleges. People who lose their jobs or cannot find work often return to school or college to upgrade their skills. Betts and McFarland (1995) found that each 1 percent increase in the unemployment rate was associated with a rise in community college enrollments of between 0.5 and 4 percent. Restricted revenue and increased demand place a severe strain on the colleges' open-door policy. In 2009, California experienced a fiscal crisis so acute that the state cut \$829 million from the budget of the community college system, the nation's largest system (Moltz, 2009). This reduction forced the system to turn away 250,000 students and lay off faculty. Cutting enrollments is accomplished not by explicitly denying admissions to less qualified students, as selective colleges do, but rather by not offering enough of the classes to accommodate demand, or by advancing the registration cut-off date to earlier in the year, thereby preventing enrollment of students who appear after the cut-off date.

Thus community colleges face particularly difficult financial circumstances. They are highly dependent on state funding, which is threatened both by long-term declines in state support for higher education and by short-term economic downturns. The open-door enrollment policy designed to promote access to college restricts the ability of colleges to raise tuition. This same policy also causes community college students to face greater economic, social, and academic barriers than typical students at four-year institutions. Restricted revenues, students with greater needs, and a growing demand for places have all made it more difficult for community colleges to keep their open admissions policy and to maintain the high quality of their education. To some extent these problems diminish during economic recoveries, but long-term trends in policy, taxation, and enrollment all suggest that the financial challenges that community colleges are as much a product of structural as cyclical forces.

Graduation, Persistence, and Evidence of Results

The “output” of community colleges is often thought of in two ways: in terms of degrees and certificates earned and in terms of the increased earning power of the individuals who earn these credentials. These are not the full effects, however, because there are also students who attend a community college just to take a single course, or a few courses, to learn something that helps them in their career.

Persistence and completion at community colleges are much lower than at most other institutions of higher education. Generally, across higher education sectors, persistence and graduation rates are closely related to the level of selectivity of the institutions. At elite selective colleges, almost all freshmen students graduate, most within four years. Graduation rates are somewhat lower at public four-year colleges and universities. Comparing community college and four-year college graduation rates is difficult, but by any measure graduation rates at community colleges are low. As we have argued, many students face serious financial, social, and academic problems that make it difficult for them to navigate the college experience successfully. Nevertheless, even among community colleges there is substantial variation in student persistence and graduation rates.

The federal government requires all schools to report graduation rates as a condition for their students’ eligibility to receive federal financial aid. These statistics are made publicly available through the U.S. Department of Education’s “Student-Right-to-Know” database, but these raw graduation rates are difficult to interpret since they do not adjust for student characteristics. A college that serves a disadvantaged population with great remedial needs should not be compared directly with a college serving mainly upper middle-class, well-prepared students; if these two colleges have similar graduation rates, it is probably the case that the first college is doing a better job. All other factors being equal, we would expect the first college to have a lower graduation rate and a lower rate of student persistence from semester to semester. Moreover, the graduation rates available in the database only include graduation from the institution of initial enrollment; therefore, a student who transfers from a community college to a four-year institution and subsequently graduates with a bachelor’s degree would not be counted as

a completer. If we consider this student to be a graduate, then these published graduation rates are underestimates.

In 2004, according to the Student-Right-to-Know data, three-year graduation rates for community college students averaged 30 percent. The lowest rate was found in Maryland, 12.1 percent; and the highest was found in South Dakota, 64.4 percent (The National Center for Higher Education Management Systems, 2009). Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006), studying the relationship between raw graduation rates and characteristics of community colleges, found that colleges with more students had lower graduation rates, as did colleges with high proportions of part-time students, minority students, and women. Finally, they found that higher instructional expenditures per full-time-equivalent student were associated with higher completion rates.

Longitudinal data that track students as they move among colleges give a more complete picture of outcomes for community college students. A national sample that tracked college students who had graduated from high school in 1992 found that after eight years about one half of the students who started in a community college had neither earned any degree or certificate nor had transferred to a four-year college. Fifteen percent had earned a two-year associate degree, and 6 percent had earned a less-than-two-year certificate as their highest degree. Eighteen percent had transferred to a four-year institution and completed a bachelor's degree, and another 11 percent had transferred but had not completed any degree.⁴

Once students do graduate with a certificate or degree, there is evidence that these credentials have economic value. Using 2000 Census data, Kolesnikova and Shimek (2008) found that associate degree holders earned more than high school graduates: 18 percent more for White men, 25 percent more for Black men, 27 percent more for Hispanic men, 29 percent more for White women, 30 percent more for Black women, and 29 percent more for Hispanic women. In addition, they found that associate degree holders in each of these six demographic categories earned more than high school graduates with postsecondary education in all 20 of the largest metropolitan areas in the U.S. This finding is consistent with earlier results from Kane and Rouse (1999) and from

⁴ Results calculated by the authors from the National Education Longitudinal Survey.

Leigh and Gill (1997), which estimated the return to an associate degree to be between 16 and 27 percent.

By examining administrative data on education and earnings from Florida, Jacobson and Mokher (2009) found that career-oriented skills development can often be a good pathway to improved earnings for students who do not perform well in high school, many of whom are lower income, and that certificates from two-year colleges can result in placement in careers that generate a good income. In addition, they suggested that counseling and assessment need to be improved in order to give students a better sense of their options, and that career-vocational programs should perhaps be increased in quantity and improved in quality.

Bailey, Kienzl, and Marcotte (2004), using three nationally-representative longitudinal surveys of students from the 1980s and 1990s, found the following: Overall, workers earned more with each additional year of schooling. Workers with some postsecondary education earned more than high school graduates, and workers with a bachelor's degree did the best. They found that a vocational certificate had the strongest benefit for women, while the earnings benefits of this credential for men was uncertain.

Bailey et al. (2004) also found that for both genders earning an associate degree carried a strong benefit, compared with workers who advanced no further than high school. Occupational associate degrees led to greater earnings gains than did academic associate degrees. Students garnered, on average, a 16 percent increase in earnings by advancing from a high school diploma to an associate degree. They also found a substantial return to a bachelor's degree for both genders, as we would expect, since all other studies have found such a positive effect.

Clearly, community college degrees, especially in occupational areas, are rewarded in the labor market. Thus, open-door colleges give many students the opportunity to acquire valuable educational credentials. Yet, while community colleges have made great progress in providing students access to a postsecondary education, it is also true that too few students actually earn the credentials offered. Over the last decade, in response to this problem, faculty and administrators at the colleges, and the policymakers and state officials who oversee them, have turned their attention to improving the success of students once they have enrolled. President Obama's call for an

additional five million community college graduates by 2020 adds impetus to this effort. Progress in success with developmental education, dual enrollment (and other measures to align high school and college), career pathways, policies to improve retention, and related strategies to promote student success will all be necessary if the community college sector is going to be successful in meeting the President's ambitious goal.

The Portability of the Community College Model to Other Countries

The community college, in its present form, is a distinctively American institution. Community colleges developed within the unique American higher education system that is comprised of a variety of public, private, for-profit, and not-for-profit institutions. The system is highly decentralized and fundamentally each of the 50 states governs its own community colleges. Even within each state, community colleges vary widely as they reflect the character and needs of their local economies, communities, and public education systems.

Community colleges are designed to meet three main goals. The first is to make college accessible to all, the second is to teach marketable vocational skills, and the third is to provide the first two years of a four-year bachelor's degree program.

Accessibility is based on low tuition, convenient locations and schedules, and a policy of accepting almost all students who want to attend, even those with very weak academic skills. This approach would certainly be useful in other countries that have made a commitment to open access to postsecondary education.

Community colleges teach occupational skills using traditional classroom instruction both in lecture and lab formats. In some cases, students participate in internships, which are work-based learning, or apprenticeships, but these education practices are not as extensive as they are in many other countries. One strength of the community college system is that it is flexible and, at least in principle, closely aligned with the local economy. This relationship makes colleges very adaptable, but it also results in great variation in quality and effectiveness. A flexible system that encourages

innovation depends on local initiative and an entrepreneurial emphasis. It also results in less standardized instruction and curricula, even within occupational areas. Compared with more centralized systems, the community college system promotes excellence and innovation, but it still allows very low quality to exist. Decentralization also makes bringing about system-wide reforms difficult.

Perhaps the most unique aspect of the American community college system is its comprehensiveness. The colleges are institutions devoted to access and specific occupational training, but they are also designed to be the first step in a higher education trajectory that could lead to a bachelor's degree or even a graduate or professional degree. Even a student who finishes high school without adequate skills or an adult who has been out of school for many years still has access, at least in principle, to the highest levels of education through the community college. Moreover, occupational programs designed to prepare students for work after two years of college increasingly include academic instruction that allows the students to transfer to a four-year institution and earn a bachelor's degree at a later date.

By combining all of these functions into one institution, educators and policymakers have created a flexible system that enables students to move in and out of college and the labor market while they maintain their options for additional education in the future. The system fits well with the career pathways concept discussed earlier. In principle, no options are ever closed. Still, critics of it argue that it is difficult to combine these functions without threatening educational quality. A comprehensive institution allows students flexibility, but many never finish. Few students who enter with very weak academic skills go on to finish even a two-year degree; fewer complete a bachelor's degree. By trying to do so many things, the colleges often cannot focus on improving a smaller number of activities or functions. Students too might be confused when they are presented with so many options, and, thus, this flexible, decentralized system requires students to have some initiative and some goal setting and self-management skills. These problems can be overcome through more sophisticated organizational design and management of the college and, for students, better counseling and information services, but it is often difficult for community colleges, always short on resources, to make such investments.

There is much for other countries to learn from the design and operation of American community colleges. This is especially true in an era when many countries are working to open their higher education systems to a broader range of their population and trying to break down the rigidities of systems based on early placement of students in tracks that make it difficult to shift programs, change goals, or return to school after some period in the labor market. But as we have seen, the benefits of the community college model come at a price — the success rates of community college students are too low. As educators and policymakers in the U.S. become increasingly focused on improving the achievement of their community college students, they are working to overcome significant problems. As educators from other countries examine the U.S. system for lessons that they might use, they should also keep informed about the many initiatives and reform efforts taking place in that system. Given the current widespread efforts to strengthen community colleges, it is likely that the system will evolve significantly over the next decades. Knowledge of these ongoing reform efforts will be helpful to other countries that want to build and strengthen the type of comprehensive, flexible, and open system that American community colleges represent.

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