

# **Community Colleges**

## **A Model for Latin America?**

Claudio de Moura Castro  
Norma M. García  
Editors



**Inter-American Development Bank**

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# COMMUNITY COLLEGES A MODEL FOR LATIN AMERICA?

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**Norma M. García**  
Editors

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## FOREWORD

The community college model has played a crucial role in the democratization and expansion of post-secondary education in the United States. This clarity of mission has resulted in some key features of the model that are particularly relevant to the challenges faced by post-secondary education in Latin America today. These include the growing and heterogeneous clientele; the need to provide alternative social mobility options for individuals for whom the traditional academic institutions are not a viable option; the need to develop a pedagogy that is both engaging and relevant to the students, emphasizing applied knowledge and marketable skills and competencies; and the need to respond to demand for training that is attuned to the requirements of the labor market.

The history of post-secondary education in Latin America provides some insights as to why similar models have failed to develop high quality, sustainable short-career programs. Specific case studies provide some clues as to the obstacles and opportunities involved in developing such programs, as well as to the key policy issues that need attention. The explosion of demand for post-secondary education in Latin America, coupled with the inability of traditional elite institutions to respond, poses some serious challenges and dilemmas to policymakers. These challenges create a new context in which the time may be ripe to revisit the community college model, giving policymakers a window of opportunity to address issues and obstacles in the areas of financing, accreditation and a regulatory and incentive framework that fosters the development of effective models in Latin America.

Latin America is far behind Europe and the United States in developing one- and two-year courses, and enrollment in those courses lags. Will it grow spontaneously as a result of market forces? Perhaps so, at least in countries with high enrollment in private post-secondary education. In others, where the private sector plays a small role or is constrained by Byzantine legislation, spontaneous growth is less likely, at least not immediately. More worrisome are new poor quality post-secondary programs in several Latin American countries that are out of step with the demands of the workplace.

This book is based on an international policy seminar entitled “New Options for Higher Education in Latin America: Lessons from the Community College Experience,” sponsored by the Inter-American Development Bank and Harvard University’s Graduate School of Education. It discusses lessons that Latin American educators might learn from the U.S. and, to a lesser extent, Canadian experience with community colleges. It also provides interesting examples of short-term post secondary education programs being carried out in some Latin American countries.

**Carlos M. Jarque, Manager**

*IDB Sustainable Development Department*

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# INTRODUCTION

Community colleges are educational institutions that provide post-secondary training through shorter programs than are offered at four-year colleges and universities. Typically, the highest degree conferred by community colleges is the associate degree.<sup>1</sup> Clark Kerr, a maven of U.S. higher education, has heralded community colleges as the greatest educational innovation in the 20th century. The trend toward institutions that correspond to community colleges is global. In Europe and the United States, one- and two-year programs account for at least half of all graduates of post-secondary education.

The emphasis is on learning from these experiences, not imitating them. Even in the United States, as elsewhere, there is an unfortunate tendency among institutions of higher learning to imitate. Poorer schools imitate richer schools and, with few exceptions, private schools slavishly and mindlessly imitate public schools (Levy, 1999). Education models have been exported far and wide, from Europe to the United States, from the United States to Latin America, from Asia to Africa, and so on. Not all have been successful. Indeed, on many occasions, the quality of national education systems has been compromised through the mixing and matching of models that are neither appropriate nor relevant to the situation at hand. Thus, while the U.S. community college experience has yielded insights from which Latin America might benefit, the appropriate response is not wholesale duplication but selective adaptation.

Studies on community colleges, even in the United States, are limited (Kane and Rouse, 1999). Elite universities focus their research on other elite universities—not community colleges. In many educational circles, community colleges remain almost invisible. In many a debate on American higher education, they are not even mentioned. In its annual ranking of institutions of higher education, *U.S. News and World Report*, for example, does not include community colleges.

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<sup>1</sup> In the United States, the associate degree is granted upon completion of a two-year program. Canadian community colleges also offer three-year certificate programs, an option not available in U.S. community colleges.

To say that community colleges suffer from a chronic status problem is an understatement. Some people view them as if they were some sort of consolation prize (see Apple, 1978; Karabel, 1972). Their own students often have a low opinion of them. As one student put it, “I couldn’t go to a ‘real’ college, so I went to NOVA [Northern Virginia Community College].”

In Latin America, the picture is even bleaker. Schools that offer two-year programs respond to the needs of the least affluent and politically vocal groups in higher education. Hence, they tend to be short-changed in the distribution of funds and, just as important, in prestige. Shorter programs are either viewed with outright disdain or simply ignored by legislation focusing solely on university degrees, as is the case in some Central American countries. In Chile, Latin America’s most advanced country in terms of the structure of higher education, the presidents or rectors of two-year programs do not sit on the Council of Presidents. This means that the shape of higher education is discussed without representation from a large subsector—there are more two-year institutions than universities. Similarly, in Venezuela, representatives of short courses neither sit on the Council of Presidents nor participate in ministerial meetings on higher education.

Current demographic pressures may force some change. Historically, the response from higher education systems to greater demand has been to increase access while maintaining conventional programs. This has in fact led to more diverse course offerings as well as day and night shifts to better accommodate students. However, dropout rates generally remain high, and as socially and ideologically appealing as it may be for more students to attend courses and obtain diplomas from prestigious universities, undergraduate programs are very often stratified by student socioeconomic status. The most challenging institutions generally remain reserved for the privileged, while easier ones are made accessible to newcomers. Some traditional courses have been refunctionalized to provide a general education better matched to their new students. They would not survive if they were to enroll increasing numbers of students who, once graduated, worked in occupations unrelated to their degree.

The problem with these stopgap measures is that they provide cover for what in general is a failure to overtly diversify higher education. Yet, as secondary education in Latin America expands its reach and more attention is given to the post-secondary level, educators and ministries inevitably will be left grappling

with the demands of populations previously excluded from higher education. New methods of teaching will have to be found, new markets for graduates identified, and better targeting mechanisms for matching students with the real market demand for labor defined and implemented. In short, the very definition of secondary and post-secondary education will have to be reexamined.

It is in this respect that the community college model may be a source of inspiration for Latin America. Community colleges, though often accused of envying four-year colleges and believed to suffer from academic drift, fill a distinct market niche. They cater to a clientele that is different from that of regular universities. And unlike many university programs, they provide skills that can be immediately applied—and rewarded—on the job.

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## CHAPTER

# 1

## COMMUNITY COLLEGES: A MODEL FOR LATIN AMERICA?<sup>1</sup>

To relate the history of the community college movement is to describe a democratic effort to make college education accessible to everyone, including millions of people who would otherwise be excluded. In the words of Gail Mellow, President of LaGuardia Community College, “to understand the history of American community colleges, we have to embrace the idea that their traditional mission has been the most broadly democratic of any segment in higher education” (Mellow, 2000).

America’s community college movement grew out of a broader national trend toward the expansion of higher education. The first Morrill Act, passed in 1862, expanded access to public higher education, especially in agriculture and what was then fondly termed the “mechanical arts.” The second Morrill Act, passed in 1890, made public education accessible to many African Americans by withholding funds from states that denied admission to land grant colleges on the basis of race. Thus, by the time Joliet Junior College in Illinois was founded in 1901, there already existed a “democratic idea” upon which to build a community college movement. The democratization of higher education that the community college movement represents is evident in the large number of minority students enrolled. Today, approximately 42 percent of African American students, 55 percent of Latino students, 40 percent of Asian/Pacific Island students, and 50 percent of Native American students enrolled in higher education attend community colleges.

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<sup>1</sup> Portions of this chapter are adapted from de Moura Castro, Bernasconi and Verdisco (2001).

The movement began when the Joliet Township school board authorized the local high school to offer the first two years of post-secondary education. The example of Joliet was soon followed by the state of California, which authorized high schools to offer the first two years of college and, in 1917, recognized the right of school districts to establish separate, public “junior colleges.” With several other states following suit during the 1920s, the junior college—later christened the *community* college to avoid the negative connotations of the word *junior* and to stress its community-based mission—took root (Vaughan, 2000). Demand for the schools increased dramatically with the return of military personnel and the creation of the G.I. Bill after the Second World War, since most of the demobilized soldiers did not fit the profile of the typical college student.<sup>2</sup> Millions of vouchers were distributed, and enrollment in community colleges doubled between 1944 and 1947.

Since then, enrollment at community colleges has increased at a much faster rate than enrollment at four-year schools. Expansion has not been limited to “communities.” Some universities, including some of the most prestigious (e.g., Harvard), have begun to offer short programs conferring associate degrees, operating, for all intents and purposes, the equivalent of community colleges within their walls.<sup>3</sup> Today, the 1,132 community colleges in the United States have a combined enrollment of 5.4 million (10.4 million if not-for-credit students are included), representing 44 percent of all undergraduates, 38 percent of all post-secondary enrollment, and 45 percent of state-affiliated education. If all of their programs are taken into consideration, these schools account for half of all post-secondary diplomas awarded.

It should be noted that 95 percent of post-secondary enrollments of short duration are in public institutions.<sup>4</sup> Only 12 percent of U.S. community colleges are private. The predominately public nature of these institutions largely reflects the roles they play, the populations they serve, and the use of government funding to promote equality of educational opportunities.

<sup>2</sup> Under the G.I. Bill, the federal government provided monthly payments to demobilized military personnel who wanted to pursue post-secondary studies.

<sup>3</sup> The Harvard University Extension School sponsors 580 courses in over 50 fields and enrolls 13,000 students annually. Among others, it offers an associate in arts (A.A.) degree.

<sup>4</sup> Even so, many private educational institutions and companies offer comparable short courses, although they do not offer equivalent certificates.

Gail Mellow (2000) has described the challenges faced by community colleges:

Every community college has its own fiscal war stories, but the problems in funding tend to be played out across the three revenue sources mentioned: tuition, local revenues, and state tax revenues. One challenge facing community college leaders is to find alternative funding sources. Fiscal challenges can also be complicated by both faculty and students. For example, community college teachers are demanding—and getting, often through negotiated union contracts—higher salaries and benefits. Their productivity doesn't necessarily increase but their cost does. In fact, their productivity is already high, for their teaching loads are much heavier than their faculty counterparts at four-year institutions.

Similarly, expanded opportunities for students, ranging from remediation to counseling to occupational upgrading, enhance a community college's democratic, comprehensive mission, but they cost money. How then can community colleges sustain their comprehensive mission?

Can two-year colleges be community-based, and “occupational,” and geared to the liberal arts and transfer (in other words “collegiate”) in their multiple functions? Can the community college today be all things to all people? Or, to put it even more bluntly, has the community college truly been a gateway to democracy? Is the community college movement, in the words of one critic, Steve Zwerling, simply a “dream”?

First, community colleges will not only survive but prosper because they are capable of rapid change—largely because they are learner-based and community-based. They respond quickly to social and economic needs of the students, parents, and communities they serve. They are integral to the “learning revolution”—a revolution embracing information technology, life-long learning through continuing education, and “learning communities” that link courses in clusters and integrated programs so that students find greater coherence in what they are learning.

Second, community colleges will add transnational or global dimensions to their missions and their programs to reflect the changing demographics of the American nation and world globalization trends. For instance, LaGuardia Community College enrolls students from more than 125 countries, including 1,100 international students. The college is located in the Borough of Queens, the most ethnically diverse county in the United States, where the local subway line is dubbed the “Orient Express.” In such an environment, fostering global education and development is inevitable. Through a global curriculum, foreign

language study, faculty and student overseas exchanges, overseas technical assistance, and linkages to local businesses and industries seeking the international expertise of our faculty, LaGuardia—and many other community colleges across the country—is going global in order to provide the cutting-edge education that students and families will require as they confront a new century.

Finally, community colleges will continue to offer fresh perspectives on the American dream because they are at the center of collaboration with K-12 schools, with community organizations, and with four-year colleges and universities. Community colleges in particular craft a compelling educational vision through their collaborative relationships with schools, colleges, and public and private sector corporations and organizations. Community college collaboration today is in vogue. Partnership is in vogue—heighting the sense of the educational continuum; becoming a source of innovative and productive institutional problem solving; and improving the coordination and delivery of services to children, families, and the community.

## Trajectory

That community colleges have grown in number is not all that impressive. From the turn of the 20th century to the present, the number of four-year institutions operating in the United States has grown as well—from 563 in 1869 to 2,309 in 1998 (National Center for Education Statistics, 1996; 1999). Rather, what makes community colleges impressive is the fact that they serve a very different type of student. An estimated 64 percent of community college students attend part-time, and 84 percent hold down full-time jobs. The average student age is 29 years; 33 percent are 30 years of age or older. Over half the students attend courses for periods of one year or less. (Many certificates can be earned in one year.)

Many courses are offered in the evening or on weekends. Great effort is made, by means of branch campuses, to offer courses close to where students live or work. For example, Strayer University, which offers mainly one- and two-year programs, maintains 13 campuses in metropolitan Washington, D.C. Community colleges often make location and flexibility in scheduling selling points in their promotional campaigns. They are often more likely than four-year schools to extend their promotional efforts to people who are already in the labor market by offering courses, or even entire programs, via distance learning (see Box 1.1).

**Box 1.1. Excerpts from the Dallas County (Texas) Community College District Website (<http://www.dcccd.edu>)**

**Convenient**

The Dallas County Community College District (DCCCD) comprises seven colleges located strategically throughout Dallas County. Anyone in Dallas County has only a short drive, bus or train ride to reach the nearest college.

**Offers Technology and Contract Training**

The DCCCD operates the Bill J. Priest Institute for Economic Development and the R. Jan LeCroy Center for Educational Telecommunications. The Priest Institute serves individuals and businesses of all sizes with training programs customized to meet their needs. The LeCroy Center is one of the largest producers of distance education products in the nation.

**Accommodates Nontraditional Students**

The primary goal of the District and its colleges is to help students of all ages achieve effective living and responsible citizenship in a fast-changing region, state, nation and world. Each college is therefore committed to providing a broad range of educational programs for the people it serves.

**Accessibility**

Community colleges understand that to attract and hold their distinctive clientele, they must offer benefits that four-year institutions, by and large, for either financial or less tangible reasons (e.g., reputation), do not or cannot. Chief among these is accessibility. Whereas many universities take pride in *excluding* students,

community colleges take pride in *including* any student who stands to benefit from a college education—though individual courses may be highly selective. Community colleges place post-secondary education within the reach of a large number of people representing an extremely wide range of interests and abilities. And, where necessary, community colleges back up their claims of accessibility by offering remedial courses. Rather than “weed out” academically weak or marginal students, community colleges strive to provide whatever help is necessary to ensure that every student succeeds to the extent to which he or she is capable.

## Social Mobility

Though community colleges are sometimes seen as a consolation prize, they are in fact powerful vehicles of social mobility. Community colleges typically attract students who are unwilling or unable to devote four or more years to the pursuit of college degrees (especially degrees that do not provide occupational preparation per se) or who are not interested in the theoretical, abstract studies that many longer programs entail. Community colleges are normally open to anyone with a high school diploma (though some programs do not require even this), so many of their students lack motivation or are academically weak. Some were able to graduate from high school only because their states do not set minimum performance standards for high school graduation. Other students may be the first members of their families to attend institutions of higher learning.

In catering to this clientele, community colleges must compensate for shortcomings at other levels in the education system, particularly the secondary level. In fact, high school equivalency programs for dropouts are a main focus for many community colleges. An estimated 41 percent of all community college students take at least one remedial course. Some students (e.g., those in English as a second language courses or those coming out of urban high schools) have not achieved even an eighth-grade reading level and must take additional remedial courses (Chinni, 1999). A survey conducted by the Center for the Study of Community Colleges finds that 7 percent of all for-credit courses in a sample were remedial, including 29 percent of all English classes and 32 percent of math classes.

Some critics have accused community colleges of dampening students' ambitions and funneling students directly into the job market by channeling them

away from conventional forms of higher education. Yet these critics often forget that, in the absence of community colleges, many students would have no opportunity to pursue higher education at all. Thus, whereas community colleges may sometimes fail to challenge their most capable students, many young people would not be studying were it not for the practical, immediate and even compensatory nature of this form of education.

Herein lies the worth and distinctiveness of community colleges, as well as the number one reason why Latin America should consider adoption of the model. Above all, community colleges are proud to work with students who need help. Their ability to deliver high-quality education that focuses on the needs and abilities of an academically underprepared clientele—and to do so with high rates of success—sets them apart from other institutions.

## **Innovations in Teaching**

Because they serve a less academically strong clientele, community colleges cannot simply mimic the teaching methods of four-year institutions. The success of community colleges in meeting the needs of average and below-average students is due in part to the use of innovative teaching methods. In fact, most major teaching innovations are hatched at community colleges. Whereas conventional four-year programs tend to perpetuate conventional teaching methodologies—and the higher the status of the institution, the more conventional the methodology—community colleges are fertile ground for innovations in teaching, including technology. There are, nevertheless, some selected four-year institutions that do not follow conventional teaching methodologies and are often seen as an outlet for community college students who want to continue their post-secondary education (see Box 1.2).

Community colleges are institutions of higher learning that continually produce solid advances in teaching methods, the relevance of subjects taught, the use of computers, and applied academics (see Hull, 1995). Internet access at community colleges is now almost universal, and more than 400,000 community college students take courses via distance learning. An estimated 78 percent of community colleges offer one form or another of distance learning courses. The average number of such courses per institution is 20 and in most cases far exceeds that found among universities.

### **Box 1.2. Private Vocational Education: The DeVry Institute of Technology**

The DeVry Institute of Technology is a four-year, regionally accredited institution with 18 campuses in the United States and Canada. Each campus works to establish positive relationships with local advisory boards made up of employers and educators. These boards provide input on how DeVry can better meet students' educational needs.

DeVry provides high-quality, career-oriented undergraduate degree programs in business and technology to a diverse student population. It specializes in teaching students through an applications-oriented curriculum that meets the demands of a growing and dynamic business and technology workforce.

DeVry's place in U.S. higher education is unique: it is different from both the community college and the traditional collegiate or university experience. DeVry can be considered distinctive because it:

- Provides valuable skills that students can translate into career opportunities. At DeVry, the economy is the main determinant of curriculum. The faster DeVry reacts to developments in the economy, the faster it prepares its students to take advantage of them.
- Has become a major outlet for community college students looking to pursue four-year degrees.
- Provides career-oriented education to students who might not find what they are looking for in the traditional system. These students and the workforce they are entering put a high priority on degrees that actually prepare the students to immediately succeed in the workplace. Thus, DeVry tailors its curriculum to meet student needs and seeks out employers for their input.
- Has made steady progress toward changing the commonly held perception that career-oriented institutions are simple "training" students and are not capable of providing a well-rounded education.



- Has earned its reputation as a high-caliber institution. For example, its Electronics Engineering Technology Program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

An important final note is the important role that financial aid has played in providing DeVry's diverse student population with access to a high-quality education. Currently, more than 75 percent of DeVry students rely on some sort of financial aid—assistance that facilitates access to higher education for a population that ordinarily might not have been able to attend college.

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*Source:* Based on Hallongren (2000).

Some community colleges do not have a single traditional classroom. On the first day of classes, each student is assigned to a workstation equipped with a computer, a videocassette player, and a syllabus. The teacher monitors progress, discussing problems and answering questions as the need arises. Students complete courses at their own pace.

Community colleges maintain close ties with local businesses. Many host business incubators, organize practicums at local businesses, and even run businesses themselves. Community colleges monitor market developments and adjust their course offerings accordingly. Many community colleges form committees designed to involve business representatives in advisory capacities, and some evaluate teachers on the basis of the success rates of their students in finding jobs after graduation.

Because the business world demands a wide range of skills, the courses offered by any given community college can range widely in sophistication—from semiconductor manufacturing to shoemaking and leatherworking. The general rule is that if there is a market for it, there should be a course for it. The corollary is just as true: if there's no market, there's no need for a course. In

gauging market demand, community colleges look not only to businesses but to the preferences of their students. Since students are usually responsible for some portion of the cost of their schooling, enrollment is a good indicator of market trends. Students don't spend their own money on things they consider useless.

## **Financing Community Colleges: Who Pays the Bills?<sup>5</sup>**

Any discussion of funding for community colleges in the United States must differentiate between public and private, or independent, colleges. Most of the phenomenal growth in the two-year college sector has been by public institutions. Private colleges accounted for 74 percent of two-year colleges in 1921, but by 1960 this had fallen to 13 percent, and in 2000 was 12.1 percent (calculated as the ratio of independents to public colleges among the 1,132 members of the American Association of Community Colleges).

The general funding pattern of independent community colleges closely parallels that of their private university counterparts. The average tuition for independents in 1997-98 was \$7,536—almost six times the average for public community colleges. As at private universities, tuition and fees constituted a far greater percentage of revenue—61.7 percent, as compared to 21.4 percent for public colleges. Also mirroring the private university model is the extent of financing from private sources—gifts and grants from individuals, corporations and philanthropic foundations. These sources accounted for 10.8 percent of private college revenue but only 1.1 percent of public college revenue.<sup>6</sup>

### ***Fifty States, Fifty Systems***

Because local control is a basic tenet of community college administration in the United States, there is no national governing body for public community colleges

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<sup>5</sup> This section based on de la Garza (2000).

<sup>6</sup> Because of their higher tuition, and, hence, the greater financial need of their students, independent colleges receive proportionally more federal financial aid than do public colleges. In 1995-96, the average full-time private community college student receiving financial aid got \$5,385, while his or her public college counterpart received an average of \$2,086. For the purposes of this discussion, however, financial aid income is not considered in the funding mix, since it goes primarily to individual students and not toward operational expenses.

and there is no single financing model. Indeed, the models vary widely among the 50 states and, in some cases, even within states.

The states also display a wide variety of governance models. In some states, all public community colleges are part of a single, statewide system. Some of these systems are independent of the universities, their governing boards being appointed by and reporting to the governor of the state, as in Connecticut. Other systems are incorporated under a statewide university system, as in Hawaii, where a board of regents governs all levels of public higher education. Alabama's community colleges are directed by a chief executive officer who reports to a state board of education. Educational programs are approved by a separate body, and day-to-day governance is provided by eight popularly elected regional boards. In Texas, each of the state's 50 community college districts has its own popularly elected governing board, each of which appoints a chief executive officer—a president in the case of single-campus colleges or chancellor if the college has more than one campus. (In the latter case, the chancellor appoints a president for each campus.) Coordination and approval of educational programs are carried out by an 18-member coordinating board appointed by the governor. (Appendix 2 provides more details on community college funding in Texas.)

### *Main Sources of Revenue*

Just as no two states use exactly the same model for governing their public community colleges, no two use the same funding model. However, the three main sources of revenue—tuition and fees, state appropriations, and local tax revenue—are much the same from state to state.

*Tuition and fees.* When universities were first established in Europe, the two primary sources of funding were private endowments and student fees. Ironically, these sources have been the least employed by public community colleges in the United States. The egalitarian spirit that has characterized the community college movement from its inception has argued against making the end users—students—bear the burden of the cost of their education.

In 1996-97, according to the American Association of Community Colleges, tuition and fees accounted for only about one-fifth—21.4 percent—of the revenue of public community colleges. This figure has steadily risen, reflecting the

upward pressure on tuition and fees caused by rising costs and flat or declining state support.

Even today's relatively modest contribution of tuition and fees toward operational costs is far higher than in past decades. In 1975, annual tuition and fees at about 55 percent of the nation's public community colleges were less than \$300. There was no tuition, in fact, at California's institutions. Gradually, however, economic pressures forced students to bear more and more of the cost. By 1968, only 18 percent of California's community colleges were tuition-free, and by 1996-97 the annual national average for tuition and fees for a full-time public community college student was \$1,283.

Tuition and fee structures vary widely from state to state. In 1996-97, California (which began charging tuition in 1983) had the lowest—an average of \$371 a year. Other states with very low rates were New Mexico (\$689), Arizona (\$782) and Hawaii (\$789). Among the highest were New Hampshire (\$2,784), Maine (\$2,558), Massachusetts (\$2,342), Indiana (\$2,331) and Minnesota (\$2,219).

Tuition and fee amounts can be deceiving because of differences in the cost of living. Another way of looking at student costs is to state them as a percentage of average family income. On the whole, and not surprisingly, states with low tuition tend to be those that are the most affordable when this standard is applied. California remains the lowest, its average tuition and fees amounting to 0.7 percent of average family income. Others in the low range are Hawaii (1.4 percent), Arizona (1.8 percent) and New Mexico (1.7 percent). Conversely, the states with the highest tuition rates are the ones where community college costs consume more of a family's income, namely, Maine (5.3 percent), New Hampshire (4.9 percent), and Indiana (4.4 percent).

Wide disparities also exist in the percentages of community college revenue generated by tuition and fees. While the national average is 21.4 percent, students pay less than 15 percent of costs in six states (California, 8 percent; North Carolina and New Mexico, 11 percent; Wyoming, 13 percent; and Mississippi and Idaho, 14 percent). In another six states students contribute more than 30 percent of the total revenue (Vermont, 55 percent; New Hampshire, 47 percent; New Jersey, 34 percent; Massachusetts, 33 percent; and Rhode Island and Pennsylvania, 31 percent).

Even though tuition and fees have risen considerably over the decades at public community colleges, they are much lower than at public universities. In

1995-96, the average tuition and fees for a full-time community college student amounted to \$1,283 compared to \$2,986 for a full-time student at a public university.

*State appropriations.* The second major source of revenue for community colleges in the United States is money appropriated by state legislatures. Community colleges depend on this revenue source more than any other (43.3 percent nationally in 1996-97). Again, however, there is considerable disparity among the various states.

In five states, appropriations constitute more than 60 percent of community college income. Nevada is the highest at 66 percent, followed by Connecticut (64 percent), North Carolina (63 percent), Georgia (62 percent), and Hawaii (61 percent). The lowest contributions by states are in Alaska (18 percent) and Vermont (15 percent).

In contrast to tuition, state appropriations have declined as a percentage of community college revenue. The 43.3 percent figure for 1996-97 was down from 46.2 in 1991-92.

*Local tax revenue.* Public community colleges are the only segment of higher education in the United States that receives revenue from local taxpayers. This practice derives from the fact that community colleges grew out of the public schools. The most common form of taxation in community college districts is the property tax, in which a tax rate is applied to the value of the property (normally real property) of an individual or business. In some states the tax rate is expressed as so many mills (one-thousandth of a U.S. dollar) per dollar's worth of property. (Hence the term millage.) In other states, the rate is expressed as a set amount of money per set amount of property value. For instance, a tax rate of 25 cents for each \$100 of property value would yield \$250 for property valued at \$100,000 ( $100,000/100 = 1,000 \times 25 \text{ cents} = \$250$ ).

Fifteen states have no source of local tax revenue; all tax revenue is generated through state appropriations. These states are divided into community college districts in such a manner that every part of the state is served by a college, state appropriations being divided among the colleges according to enrollment. Revenue sources have a direct effect on tuition. State residents who live outside community college districts pay higher tuition than residents of the districts; the tuition for out-of-state students is higher still.

This category of funding spans a wider range than any other (expressed as

percentages of annual college budgets). The national average is about 19 percent, but (as stated in the previous paragraph) some schools receive none while others receive between less than 5 percent and 30 percent or more (Alaska and Wisconsin, 42 percent; Kansas, 35 percent; Nebraska and California, 34 percent; and Illinois, 32 percent).

### *Other Sources of Revenue*

According to the American Association of Community Colleges, federal funds account for 5.4 percent of public community college revenue. These funds are chiefly allocated for special projects and special categories of training. Federal grants are available, for instance, to aid in the recruitment of minority students and to provide education in certain technical disciplines. Most federal funds are earmarked for specific purposes and cannot be used to cover general operating expenses, and therefore do not figure prominently in this discussion.

Revenue from private sources—gifts, bequests and grants from foundations—accounts for only 1.1 percent of public community college revenue nationally, but many community colleges have taken steps to increase that percentage. In 1987, 53 percent of public community colleges had established foundations to raise private funds. A 1997 survey showed that 88 percent had active foundations while another 4 percent were planning to establish them. Revenue from foundations, however, is much like that from the federal government. It is not usually applicable to routine operations but must be used for student scholarships, rewards for faculty excellence, funding of faculty and staff development, or other special applications.

### *Financing Summary*

The bulk of funding for most public community colleges in the United States comes from public sources, both state and local. This is in keeping with the community college mission of providing access to higher education by keeping the cost to the student as low as possible. As pressures on public sources of revenue have increased, the cost to the student has risen. But community colleges remain the best bargain in U.S. higher education.

## Economic Benefits for Students<sup>7</sup>

Comparisons between the performance of community college graduates and students who either have not completed post-secondary education or have graduated from four-year programs indicate that community colleges offer real, measurable benefits. Coursework completed at community colleges correlates positively with better job performance and pay, providing job-ready skills that, by some accounts, lead to a 15 percent improvement in performance. Each additional year of coursework completed brings a 5 to 10 percent increase in wages. More important, initial gains do not dissipate over time. According to the American Association of Community Colleges, average expected lifetime earnings for a graduate with an associate degree exceed \$1 million, about \$250,000 more than a person with only a high school diploma. Even students who complete only part of an associate degree program earn 10 percent more on average than people with only high school diplomas. In short, the economic benefits are respectable and begin to be felt after only a few months of study. It is precisely this rapid return that makes community college courses attractive to students who are not able to devote a great deal of time and money to higher education.

## Accountability<sup>8</sup>

Accountability is “an obligation or willingness to accept responsibility or to account for one’s actions” (Webster’s *Collegiate Dictionary, Tenth Edition*). Every institution is accountable, i.e., obligated, to its stakeholders. This obligation may be unnerving, as it forces leaders to account for virtually every action of their institutions. But effective leaders address it objectively, as they know they must. The situation is no different for educational institutions, and, in fact, the demand for accountability in education is on the rise: “There is strong evidence today that the remarkably persistent calls for accountability are not going to go away; rather, they will only grow louder as accrediting agencies, taxpayers, students, legislators, and other entities call for institutions of higher education to account for themselves” (Roueche et al., 1997).

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<sup>7</sup> This section is based on Kane and Rouse (1999).

<sup>8</sup> This section is based on Chase (2000).

But to whom are America's educational institutions, particularly its community colleges, accountable? Who are the stakeholders on the campuses and within the communities? How do community colleges answer to those stakeholders? What is the nature of their obligations?

This section addresses these questions by treating accountability as a recurring theme that involves numerous entities—state and local governments, boards of trustees, accrediting organizations, communities, and students, to name a few—and takes several forms, including fiscal and moral accountability.

In a complex system such as a community college, accountability is in force at numerous levels and is cyclical: students are accountable to faculty members, faculty members are accountable both to students and to deans, deans are accountable to presidents, and presidents are accountable to boards of trustees. Each institution is accountable to state and local governments and to its community, which consists of taxpayers, many of whom are potential college students. Thus, the system is circular and interdependent.

### *The Stakeholders*

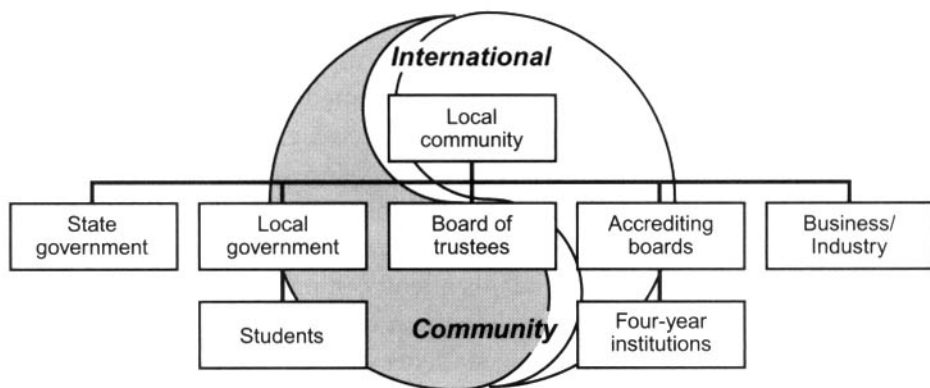
The stakeholders of American community colleges are as diverse as the colleges' functions. Figure 1.1 illustrates the groups that are invested.<sup>9</sup> The following subsections briefly examine several of the most important stakeholders to whom community colleges are accountable: state and local governments, boards of trustees, accrediting boards, four-year institutions (to which community colleges want their graduates' credits to be transferable), students, business and industry, and local communities.

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<sup>9</sup> Several federal agencies and national associations serve as catalysts in the accountability process by conducting research, funding programs, and serving as resources and advisory bodies. Federal agencies conduct and provide access to national and international studies whereby institutions can assess themselves in relation to other institutions in their states or regions, which may assist in the accountability process. National associations provide assistance in the areas of leadership and professional development, and commission studies and publications that address assessment and accountability issues.



**Figure 1.1. U.S. Community College Stakeholders**



*State and local governments.* Community colleges are accountable to these governments because they receive most of their funding from state and local taxes. Within this general framework, however, there are many variations: “As is true with so much else about community colleges, funding is characterized by its diversity and varies from state to state and, in some cases, from college to college within a state” (Vaughn, 2000). In Oklahoma, for example, the vice chancellor for academic affairs, a representative of the state government, periodically examines each academic program, taking note of how many students are enrolled in certain courses, how many students are pursuing which majors, and how many students complete their programs. The state has the authority to terminate a program if it fails to meet state requirements. If a community college in Oklahoma wants to initiate a program, it must submit an estimate of anticipated enrollment, and the overall success of the program is assessed at the end of three years (see Appendix 3).

Much hinges on full-time enrollment (FTE). For example, if several colleges in Oklahoma offer a music program, the state determines the average cost of running the program (based in part on the participating colleges’ FTE estimates) and funds each college equally. If FTE for a given program decreases over a period of time, state funding may be reduced accordingly. Consequently, colleges consider FTE desirable, but only up to a point. If a college’s FTE increases

drastically, the state is often unable to compensate and the college must absorb the additional expense.

In Pennsylvania, two-year colleges are audited every year. The results of those audits influence state regulations on how funds are to be used. Colleges must match each state dollar for buildings, equipment and supplies.

State and local governments are putting increasing pressure on community colleges to publish their graduation rates. Many colleges are reluctant to comply, claiming that graduation rates do not reflect the quality of the education their students receive. Given the large number of part-time students involved, the situation is complicated. Some students attend community colleges for only a semester or two and then transfer to four-year colleges or enter the workforce. Statistically, they are counted among students who did not graduate, yet they may have received something quite valuable from the college. Colleges must comply with requests for these data, even though the numbers may suggest (inaccurately) that they are incapable of retaining students.

Between 1986 and 1988, the California legislature passed laws that required community colleges to develop accountability reporting mechanisms. Subsequently, an accountability task force was convened to develop a model containing five major components: student access, student success, student satisfaction, staff composition, and fiscal condition (Vaughn, 2000). Other states took, or examined the feasibility of taking, similar steps: "California was not alone in its interest in accountability for higher education. A 1989 survey conducted for the National Governor's Association found that 36 states had implemented or were considering implementing some form of accountability system" (Boggs, 1997).

In Florida and South Carolina, among other states, there is a move toward performance-based funding, under which community colleges receive funding on the basis of their graduates' success in demonstrating standardized competencies in their fields of study. For example, if a community college has a nursing program, the college is funded on the basis of the number of its nursing graduates who pass the licensure exam.

*Boards of trustees.* The governance process at community colleges is similar to that of companies and universities. Depending on the state, each community college has a board of directors (or trustees) that governs its activities. The president of the college is responsible for the college's daily operation and is accountable to the board of directors and (in a state system) a chancellor, who reports to a governing board.

The board of trustees is accountable for the college's general health and well-being; in many cases it is responsible for approving budgets, programs and personnel, and for holding the president accountable. Trustees are more apt to assess and evaluate the budgetary concerns of an institution than the quality of teaching and learning.

Board structures at community colleges fall into three categories: elected boards, appointed boards and state boards.

The members of *elected boards* are elected by the citizens of their communities for given terms, and are directly accountable to the people who elect them. States that elect their boards of directors include Kansas, Arizona, California, Michigan and Texas.

Members of *appointed boards* are appointed by the governor to represent various segments of the community. Terms are generally five years in duration. Appointed boards may also be selected by other state officials. One positive aspect of this approach is that members of the board do not spend money on election; a negative aspect is that members' loyalties may lie more with persons who appointed them than with the institutions they serve. States that have appointed boards include Florida, Illinois, North Carolina and Washington.

Some colleges are governed by *state boards* appointed by governors. Two potential drawbacks of this arrangement are that state boards may not be sensitive to local needs and may be more loyal to the officials who appoint them than to the college systems they serve. The community college systems in Alabama, Virginia and New York are governed by state boards.

*Accrediting boards.* At five- and ten-year intervals, community colleges undergo review processes administered by one of the six regional accrediting bodies in the United States. Each college periodically conducts a self-study and reports its findings. Every ten years, the accrediting bodies send teams of educators from other two-year institutions, and sometimes four-year institutions, to evaluate academic programs, facilities, and governance. Within this general framework, however, no single model or process is representative of the overall accreditation process at community colleges.

Prager (1990) notes that "public concerns about accountability have resulted in accreditors' demands for proven outcomes and have challenged community colleges with diverse populations to provide appropriate information."

The criteria by which two-year institutions are accredited are the same as those for four-year institutions. This is necessary because of the transfer role that

community colleges play. In many cases, community colleges have been more successful than universities in establishing institutional effectiveness as measured by student outcomes. (Some larger universities have experienced difficulties in measuring student outcomes.)

The accreditation process represents a challenge to community college leaders, “who must respond by defining the purpose of accreditation at their colleges, securing necessary assessment resources, and fostering the requisite sense of professionalism among faculty” (Prager, 1990). As community college administrators well know, however, accreditation is necessary. Community colleges must ensure that their programs are of consistently high quality in order to maintain their accreditation standing and serve their communities to the best of their abilities.

*Four-year institutions.* Community colleges are accountable to four-year institutions in that they would like their credits to be widely accepted for transfer. For this reason, four-year institutions take community college accreditation very seriously. The transfer function of community colleges is important. More than half of all students beginning their undergraduate education in the United States choose community colleges. Therefore, it is imperative that community colleges take all possible steps to ensure that, should a student wish to transfer into the junior year of a four-year education, the transfer of credits will be as seamless as possible.

Many community colleges have articulation agreements with four-year institutions in their communities, states and regions.<sup>10</sup> In most cases, the agreements are signed only after the courses offered by the two-year institutions are carefully evaluated by the appropriate departments in the four-year institutions. In some states, the transfer process is more or less automatic. In Florida, for example, state law stipulates that a public four-year institution must accept any graduate of a public two-year institution, provided that the student has an acceptable grade point average.

No matter what the agreement between community colleges and four-year colleges and universities, the latter are important constituents to which community colleges are accountable.

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<sup>10</sup> Some U.S. community colleges have articulation agreements with colleges and universities in other countries. For example, Holyoke Community College in Massachusetts has an articulation agreement with the University of Plymouth in England in one of the sciences.

*Students.* Community colleges are accountable to their primary clients—students. For this reason, community colleges should continually assess the success of their students in transferring to four-year institutions or finding jobs. Some community colleges take this a step further by monitoring their former students' academic performance at the four-year institutions to which they have transferred or their job performance (depending on which route they have taken).<sup>11</sup> This information is easier to come by in some states than in others. Community colleges in Washington, for example, receive data from the state labor department regarding the success of their graduates. The department generates reports on who is and who is not employed and which graduates are employed in occupations related to their training. These data provide measures of student success and give colleges in the state an important accountability base.

Where possible, community colleges monitor a variety of indicators of student success, attainment of goals, degree completion rates, employer assessment, placement rates in the workforce, demonstration of citizenship skills, and responsiveness to community needs. All these indicators have measures, explanations and examples of how to achieve these outcomes with regard to the students whom community colleges serve. Many of them address how the student will function in continuing academic studies, while others look at how successful the student will be in the workplace and the community.

Student preferences help keep colleges accountable. If, over time, students repeatedly choose not to take certain courses, something is wrong. The students perceive the courses as irrelevant, poorly taught, or unrealistically difficult. Or they may simply be unaware of the benefits of the courses. Whatever the situation, community colleges know that student preferences are significant and should be taken seriously. If there is an ongoing problem, sooner or later it will be reflected in enrollment trends. The opposite is also true of course: if a college is excelling in a certain program or area, student enrollment will increase.

Accountability to students has been a motivating factor in community colleges' growing use of online education. As information technology becomes increasingly integral to virtually all aspects of modern life, more and more

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<sup>11</sup> Some colleges actually guarantee their degrees, and promise further training if graduates do not acquire jobs within a certain period of time. However, the U.S. Department of Education estimates that approximately 90 percent of community college graduates obtain employment within three months of graduation.

students expect the anytime, anyplace convenience that online teaching and learning offer. As a result, online education is the fastest growing sector of higher education.

*Business and industry.* The accountability of community colleges to this sector derives from the simple fact that, if business and industry are not pleased with the quality of graduates that a community college produces, they will not hire them. Consequently, community colleges routinely solicit input from area employers to ensure that their offerings are consistent with the real demands of the workplace and that their graduates are job-ready.

Almost all community colleges have one or more business advisory boards—a college in Oklahoma has fifty—formed for the purpose of ensuring that the colleges are up to date on skill needs in the workplace. This function is essential because occupational disciplines tend to change more rapidly than academic disciplines. Business advisory boards ensure that many issues pertaining to the future employment of graduates are addressed prior to graduation. The boards meet regularly (usually quarterly) to ensure that the colleges' curricula meet industry needs. Regular communication with business and industry also serves to remind colleges, and their students, that there really are jobs to be had. In addition, business advisory boards provide feedback on how graduates perform in the workplace.

Community college partnerships with business, government and other educational institutions are increasingly common. The partnerships are often formed to carry out specific projects or deal with crises. For instance, when people lose jobs or a military base closes, it is often the community college that steps in and helps retrain the workforce. Some community colleges work with multinational corporations on projects involving information technology, telecommunications or other technology-driven activities. Each of these partnerships involves community colleges being accountable to their partners.

Corporations often contract community colleges to provide training for their employees. A national study conducted in 1997 asked employers why they chose community colleges to provide their training. The major reasons cited were cost-effectiveness and customization (Zeiss et al., 1997). This clearly speaks to the accountability issue. Business and industry invest large amounts of money in the training they receive from community colleges and expect a fair return on their investment. If they don't get it, they will take their money elsewhere.

*Local communities.* Community colleges are integrally connected to the communities they serve. Their clienteles are largely local, as are the businesses that hire their graduates, and, in many, a significant portion of their revenue comes from local property taxes. Consequently, community colleges routinely reach out to their local constituents to ensure that they are fulfilling their obligations to their communities. For example, the board of trustees at a community college in the Seattle, Washington area regularly conducts public meetings with selected community leaders to talk about what they require from the college and how they rate the college's performance. (Separate meetings are held with representatives from local government, public agencies, K-12 schools, and business and industry.) The meetings make the local community feel invested in the activities of the institution, show the community that the college is willing to be held accountable, and provide feedback that can be applied to the college's strategic plan.

Accountability to local communities is also evident in the many cultural and social activities that community colleges offer. Stakeholders at many levels agree that "it is important for community colleges to sponsor art exhibits, sports events, concerts, drama productions, health fairs, community forums, and other activities that enrich the lives of the people served by the college" (Vaughn, 2000). These activities perform a necessary outreach function, bringing potential clients and supporters to the campuses and increasing the visibility of the colleges' programs and offerings. They also create a climate of openness, which is increasingly necessary, given the growing diversity of communities in every region of the country. As Griffith and Connor (1994) write: "The public comprehensive community college is committed to serving all segments of its community. This task is by no means an easy one, given the changing nature of the various populations served." As community college constituencies become increasingly diverse, so must the colleges adapt.

## ***Reporting***

Most states require their community colleges to submit detailed reports providing information on student access, enrollment, transfer programs and transfer rates, student satisfaction, occupational preparation relative to state and local workforce needs, and the fiscal conditions of their respective communities and



districts. The process is cumbersome, time consuming and often frustrating. Each college considers its mission and setting unique but must nonetheless find an accurate way to represent itself using the language and format required by state and federal bureaucrats. To meet strict reporting requirements, many schools have increased expenditures on institutional research and hired additional staff to crunch the data and produce the reports. Support also has come from the six regional accreditation agencies (e.g., the Commission on Higher Education of the Middle States Association, the Commission on Institutions of Higher Education of the New England Association of Schools and Colleges, and the Commission on Colleges of the Southern Association of Colleges and Schools). In addition to conducting various reviews and site visits, the agencies evaluate reports produced by the community colleges and make recommendations regarding accreditation.

Reporting has a direct effect on funding, which is by no means automatic. Some states, such as Florida and South Carolina, use a system of performance-based funding.

### *Defining Success*

Community colleges face a very real challenge in terms of walking the walk and talking the talk of results-based assessment. The colleges operate with a set of inputs that differs from those of four-year colleges and universities and produces a different type of output. Because admission is open, community colleges attract a wide array of students—transient students, students with disparate abilities and academic goals, students who know very little English, and others. Their faculty members likewise differ from those at conventional schools. Most are adjunct. And, in a very real sense, what the community faces, the community college also faces. For instance, many community colleges have found themselves at the forefront of local responses to welfare reform, providing soft-skills and career training. According to the American Association of Community Colleges, an estimated 48 percent of community colleges offer welfare-to-work programs. Of those that do not, 54 percent plan to offer programs designed specifically for welfare recipients.

Given these factors, conventional indicators of institutional effectiveness (e.g., graduation rates, semester-to-semester retention rates, faculty salaries,



library endowments) do not—and cannot—provide an entirely accurate picture of whether a community college is “succeeding” or not. Yet the burden of accountability remains. The breadth of the range of services provided by community colleges does not soften the expectation that their graduates be able to transfer credits to four-year colleges or to find and retain jobs. Thus, to be deemed successful, i.e., to meet the demands of the many stakeholders to which they are accountable, community colleges must satisfy a wide range of community-based needs while remaining true to their core purpose of providing academic and occupational preparation.

### ***What the Future Holds***

“Accountability is the watchword for the 1990s: Government demands justification for the funds it provides higher education, accrediting bodies seek demonstrable quality in programs and services through measurable outcomes assessment methodology, business and industry demand a literate workforce, and taxpayers seek a guarantee for personal education dollars and time spent in training” (McAtee, 1997).

So what does the future hold? It probably holds more mechanisms for assessing accountability in higher education.

Results of a survey regarding the effectiveness of selected two-year institutions in North America, conducted by the University of Texas at Austin, revealed that, “while significant steps are being taken by North American community colleges to demonstrate their effectiveness, their progress is decidedly slow” (Roueche et al., 1997). Other responses to the survey led to the following recommendations:

- Colleges should begin immediately to respond to the increasing calls for greater institutional effectiveness.
- Colleges should ensure that faculty members and administrators are well informed about the issues that are being addressed by influential policymaking groups and organizations.
- Colleges should research successful practices and adapt them to their situations.

- Personnel whose responsibilities and duties will be affected by measures taken to increase institutional effectiveness should be involved in discussions about evaluation and change.
- If community colleges believe that the standards by which they are being judged are not appropriate, they must identify and agree upon the criteria by which they should be judged.

Like all educational institutions, community colleges must take steps to get “up to speed” in the rapidly growing field of information technology (IT). But, because IT, or at least the teaching of IT skills, is still in its infancy, many questions remain unanswered. For instance, by what standards should colleges and universities be held accountable for training IT professionals? How can institutions possibly keep pace with developments in the field? The next few years will probably witness the emergence of international teaching standards in IT. Given the increasing globalization of education, including education at the community college level, these standards will represent an area of accountability to which community colleges must respond.

## The Changing Functions of Community Colleges

Much of the appeal of community colleges lies in their evolution and in the new roles they have taken on over time. Their original function of offering the first two years of post-secondary education is but one of the benefits they offer.

The original purpose of community colleges was to enable students from smaller cities (or students with less preparation) to complete the first two years of post-secondary education in their hometowns. Since the course content of the first two years of all majors was basically the same, serving relatively small enrollments was economically sound. Over time, the concept (and the reality) of the “comprehensive college” has gradually emerged. Today the transfer function coexists (albeit not always as the primary function of the school) with technical and career training, remedial education, contract training for firms, continuing education, and recreational learning. The distribution of degrees conferred by American community colleges in 1996-97 is illustrative: 167,000 degrees awarded in general studies and humanities, 77,000 in health professions, 72,000 in business management and administration services, 20,000 in engineering-related tech-

nologies, and 17,000 in protective services.<sup>12</sup> Although most degrees are conferred in areas in which transfer is possible (e.g., general studies and humanities), two-thirds of all registered nurses in the United States receive their education—which, by definition, is occupational and technical—at community colleges.

It is true that community colleges tend to offer a diluted form of academic preparation and are unable to compete with the rigor and demands of most four-year programs. But demanding programs require more time and academic ability than many students have. The more personalized attention and interest that community colleges can offer those students should not be underestimated. Many choose community colleges precisely because the setting is unpretentious and gauged to their needs.

Other considerations enter the picture. Increasingly, attending a community college is seen as a convenient way to get a head start on a four-year degree. Thus, on the one hand, community colleges admit high school dropouts looking for a second chance and high school graduates unable to make the cut for university study. On the other hand, they attract fast-track students who want to enroll while still in their junior or senior years of high school. Students opting for “dual enrollment” clearly do not belong to the “academically challenged” clientele commonly associated with community colleges, nor do the growing numbers of graduates of four-year programs and people with graduate degrees who seek applied technological training not available to them in traditional academic programs.

Community colleges increasingly attract professionals looking for career changes. Many are established in their careers and already have academic degrees (an estimated 30 percent have bachelor degrees), including graduate degrees. The community college format is best suited to their needs in that it offers the flexibility necessary to combine work and continuing education. Some students, of course, are looking for very specific training, e.g., in areas such as computers and information technology.

Community colleges have also become the education arm of the Statue of Liberty. In areas with high percentages of immigrants, community colleges are a port of entry for people without the English language skills required for regular

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<sup>12</sup> According to the American Association of Community Colleges.

university study. Along the Mexican border, for instance, more than 50 percent of students at some community colleges are native Spanish speakers; nationwide, community college enrollment of foreign students or immigrants averages 15 percent.

Seen in this light, community colleges have evolved into studies in contrast. Yet this is not what is most impressive about community colleges. Kerr would not consider them the greatest innovation in higher education if all they did was offer two years of watered-down general studies to economically underprivileged students or provide convenient schedules for nontraditional students. In fact, academically speaking, community colleges offer nothing special at all. For someone who is unable to attend some other kind of school, it could be a major step forward. But overall, it is nothing extraordinary. What community colleges *have* evolved into, however, is very special indeed.

There are many similarities and differences between the more than 1,200 community colleges in the United States. However, their programs generally fall into one of three categories: preparation for transfer or “university-parallel” programs, career education, and continuing education. Although these three categories vary a little from state to state, they are the educational backbone of the U.S. community college system.

### ***Transfer from Community Colleges to Universities***

In the United States and Canada it is possible to transfer from a community college to a four-year college or university as a third-year student. This transfer function is praised by all who are concerned with equity and equality of opportunity. Proponents of the community college model put this at the top of their list of selling points.

But this is perhaps the most difficult feature for other systems to copy (see Box 1.3). First, it is not as easy and automatic in the United States as it may often sound. Even the U.S. “community college system” is a term in conflict with itself—there is no system in the United States, although there are community colleges in all 50 states. Sometimes individual community colleges are governed by the state in a highly centralized manner, whereas in other states, each community college has considerable autonomy. Second, as the Canadian experience shows, countries with European-style higher education may have much

greater difficulty in solving the complications of transfers. The structure of Latin American curricula makes the transfer much more difficult.

Transferability is determined by the receiving institution—the university. The transfer process varies from state to state and from community college to community college. Transfer agreements are usually spelled out in colleges' course catalogs or on their websites. For example, the website of the University of California–Irvine's Office of Admissions and Relations with Schools states that it "gives high priority to junior-level (about 60-65 credits) students transferring from California community colleges. UCI defines California community college transfer applicants as students who have completed the last 30 semester/45 quarter units at the California community college."

The University of Arizona spells out the terms of its transfer agreements in a transfer guide for community colleges, which presents the lower-division requirements of bachelor's degree programs at the University of Arizona in terms of transferable courses available at Arizona community colleges, numbered in the community college notation.

Some agreements are less formal and provide leeway for evaluating each request for transfer. *The Ontario College to College Transfer Guide* helps students identify and explore transfer possibilities within the Province of Ontario community college system. Most transfers among Ontario's colleges are handled on an informal student-by-student basis.

The process of transfer involves many factors and varies widely. It is best achieved through a faculty-to-faculty curriculum mapping process that aligns community college programs with "like" programs at four-year colleges and universities.<sup>13</sup>

*University-Parallel Programs.*<sup>14</sup> University-parallel programs usually last for two years and for the most part contain courses that can be transferred to four-year colleges and universities. The process of transfer is often referred to

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<sup>13</sup> One creative approach to enhancing the relationship between community colleges and universities has been to establish the upper-division courses and programs at community colleges. In other words, why change location after graduation from the community college? Thus, in certain circumstances a cohort group of students may enter the community college and, after four or five years of study, graduate with both associate degrees and baccalaureates without leaving the community.

<sup>14</sup> Adapted from McQuay (2000).

### **Box 1.3. Toward a Global System of Transfer**

Transfer at the international level is still in the beginning stages, but promising efforts are under way.

Schools in Australia, Canada and the United States recently formed a partnership to facilitate transfer to colleges and universities outside the student's country of domicile and to develop a process that could be replicated by other colleges and universities. The partnership includes Brevard Community College in Cocoa, Florida; Delaware County Community College in Media, Pennsylvania; Humber College in Toronto, Canada; and the University of Hawaii Community Colleges headquartered in Honolulu, Hawaii. As the planning and deliberations for the curriculum alignment process between the participating countries was conceived, five diverse academic programs would be studied: electronics, hotel and restaurant management, media, avionics, and office administration. The programs selected were diverse in terms of curriculum, geographic location, generally established standards of faculty qualifications, and characteristics of advisory committee membership.

Initially, the planners suspected there were more similarities than differences in the curriculum designs. This was confirmed when faculty specialists aligned and compared the curricula. However, this is not to say that all programs aligned or could be aligned and thus eventually articulated. There were major differences in programs that prevented alignment and articulation.

The most glaring example of nonalignment was the aviation program (called a course in Australia). In the United States and Australia, all aspects of aviation programs (courses), including faculty, curriculum hours, and structure, are regulated by the respective country's aviation industry. This approach to curriculum is quite different from country to country and does not allow for deviation of requirements. Therefore, a lesson was learned; that is, programs developed under the auspices of a regulatory agency may not align and articulate. One might suspect that this would be the case with programs dealing with regulation and licensure, such as those for

registered nurses and dental hygienists. However, the four remaining programs—electronics, hotel and restaurant, media, and office administration—were likely candidates for the alignment process.

### **MARA–Humber College–Penn State Harrisburg<sup>1</sup>**

A recently formed engineering technology partnership between Majlis Amanah Rakyat-MARA (Kuala Lumpur, Malaysia), Humber College (Toronto, Canada) and Pennsylvania State University at Harrisburg demonstrates how three countries working together can develop an exemplary program. The Asia Pacific Economic Cooperation-Human Resource Development in Industrial Technology Network called the initiative one of the best industrial technology programs in the world.

The programs delivered by Humber College are the same as the standard two-year, four-semester engineering technician training programs offered by the other colleges. In approximately 45 percent of the program courses, the Malaysian students are in classes with Canadian students. Following the two-year technician program, more than 90 percent of the students elected to complete the optional third year, which leads to technologist qualifications. Following this, approximately 60 percent of the students continued an additional year of studies at Penn State, graduating with bachelor of engineering technology degrees, which this program offered in a continuous format. This enabled the students to complete six semesters—usually accomplished in three years—in 24 months. This was followed by one full year at Penn State Harrisburg in order to complete the requirements for bachelor of engineering technology degrees. Thus, students returned home in three years with three-year engineering technologist diplomas and four-year bachelor of engineering technology degrees.

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<sup>1</sup> This section is based on Hatton (1995).

as “articulation.” Articulation varies between colleges and universities and also varies according to the program of study. Some community colleges are beginning to recognize the value of developing guaranteed transfer processes with universities. Guaranteed transfer is based on written agreements between community colleges and four-year schools specifying that students who enter the community colleges will be allowed to transfer credits to the four-year schools if certain academic standards are met. Guaranteed transfer is very attractive to students, including international students.<sup>15</sup>

University-parallel programs usually cover one of the following areas, with a typical program consisting of 18-22 courses: behavioral science, business administration, communication arts, computer science/management information, education, engineering, liberal arts, natural science, and science for health professions.

*Advantages.* Although one purpose of community colleges is to make post-secondary education available to students who, for whatever reasons, are unable to attend four-year schools, community colleges increasingly endeavor to offer benefits that make them competitive with four-year schools. When all relevant factors are taken into consideration, it often makes better sense for a student to begin his or her four-year career with two years at a community college.

The most obvious advantage of community colleges is value. Because costs are shared by a three-way partnership between the local and state government and the student, community colleges offer one of the best bargains in higher education. Add to this the fact that most community college students are day students, and the total cost is only a fraction of that of attending a four-year school away from home. Living at home also allows community college students to spread their course work over a longer period, if necessary. For instance, a student might take four years to complete two years of coursework, working part time to pay tuition or to save money for use after transferring.

Another strong advantage is flexibility and convenience. Most community colleges offer evening, weekend and other nontraditional schedules. Many offer

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<sup>15</sup> University-parallel programs are sometimes said to be based on the “two-plus-two” concept—two years at a community college plus two years at a four-year college or university. In the United States, two years of post-secondary study generally earn 60-68 credits (where one credit is awarded for each hour per week in the classroom for 15-16 weeks). The number of credit hours varies, depending on the program.



classes at branch locations. Many courses, sometimes even complete programs, can be taken entirely online.

And finally, community colleges enjoy a high level of teacher support and support through student services functions. Faculty members are hired to teach, not to add luster to their schools' reputations through publishing. In fact, most community colleges make a point of not promoting research. Only 4 percent of their faculty members are engaged in research—a far cry from the “publish or perish” attitude permeating the halls of academe. In the words of the president of Northern Virginia Community College, “I think there is a place for researchers and thinkers...and a place for the worker bees and the folks who want to get down and dirty with it.” Community college faculty members “get down and dirty with it.”

Student services take the form of placement testing, psychological counseling, and tutoring. At most community colleges, entering students are given examinations to determine their readiness to begin college. Depending on examination results, students receive exemptions from certain courses, take remedial courses, or begin their programs as true freshmen (i.e., with neither exemption nor remediation). Community college courses are designed to meet the needs of a wide range of abilities, from advanced achievers to students who need additional time and preparation. Tutoring services are often available, as are counseling services to help students choose appropriate programs and explore employment opportunities.

### *The Vast System of Career Education*

Career education is the sphere in which community colleges have grown the most in recent years and which has given them their strongest identity.

At the beginning of the 20th century, the United States took a drastic step, opting for what were then called “comprehensive high schools.” The voices of those who wanted to see vocational schools established alongside academically oriented schools—the status quo in Europe—fell on deaf ears. Rather, the United States opted for a model under which various options could be offered under a single roof, depending on the skills and interests of the students. More academically inclined students could take more varied and rigorous schedules, often opting for courses in science, math and writing. For less ambitious students, less

demanding courses also would be available, as would vocational training. In effect, then, U.S. schools offer both general education and technical curricula.

At the time of its inception, the system had its merits, especially in matters related to career education. In a country where manual labor has been held in comparatively high social esteem, the commingling of manual and intellectual activities has been less problematic than in societies (e.g., European) where differences of class and social category are more pronounced. The model was exported as far as the sphere of influence of the United States reached.

Over time, the attractiveness of the model waned. At home, equity concerns were compromised. Rather than providing equal education for all, the model provided a convenient means for students to be profiled and tracked. Those who did poorly in science and the humanities were “pushed” toward vocational training. The more academic subjects—e.g., the sciences and humanities—thus acquired greater status and the “comprehensive” nature of high school education waned. With the increasing complexity and theoretical development of many technical professions, the amateur-level training provided at high schools lost its relevance and ability to respond to the economy’s needs. Abroad, the model proved to be a major disappointment, despite its backing by powerful players such as the World Bank.

Community colleges gradually moved into the niche that the “comprehensive high schools” were unable to fulfill. Career education has migrated upward and community colleges have been at the receiving end of this migration. Career education through two-year programs at the post-secondary level is steadily replacing vocational courses at secondary schools. Some say this is the most valuable service community colleges provide. And it is an area from which Latin America can draw interesting lessons.

Associate degrees and shorter programs combine academic courses with occupational courses. The academic courses are comparable to those taken by students at four-year schools. The challenge in all career education programs—and community colleges are no exception—is to obtain synergy between the academic and the occupational. It is in this regard that career education programs have the potential to “contextualize” academic concepts and bolster the durability of skills taught in and through occupational training. If this is well done, students with relatively low scholastic aptitudes can master academic content better than if they were to take purely academic courses. (Or so the theory goes—

there is no consensus on the extent to which community colleges fulfill this potential.)

Yet, one way or another, the community colleges have become the career education providers of choice in the United States and Canada.

### ***Continuing Education***

The third major component of the community college mission is continuing education. Given the community-based nature of community college funding and decision-making, community colleges naturally assume the very important role of offering courses that serve all members of their communities. This is a social function that is of incalculable value. Continuing education courses can last anywhere from a couple of hours to a semester and cover a broad range of topics, from recreation and hobbies to small business development and computers. For example, a community college in central Texas offers arts and hobbies, building and construction trades, fire protection technology, computers, health and fitness, defensive driving, emergency training, health and human services, music and dancing, languages, water activities, tennis, cooking, small business development, real estate, and supervisory management.

Community colleges devote considerable time and resources to developing, administering and promoting their continuing education offerings. Many community colleges mail course catalogs to every home in their districts.

### ***Contract Training***

In addition to offering career education programs, most community colleges provide employee training to businesses or government agencies on a contract basis. In contrast to regular career education curriculum, which is designed according to general business trends, curriculum for corporate employee training courses is designed to meet the specification of the contractor. Fully 95 percent of community colleges provide contract training.

In providing contract training, community colleges have become capitalist enterprises that sell courses. (In this sense, they are not much different from the best Latin American technical schools and universities.) In many respects, community colleges are ideally situated to provide this service. Says David Pierce,

president of the American Association of Community Colleges: “We are affordable. We can design programs quickly. We can do it faster for less money and we still have quality.” Providing contract training not only generates revenue for community colleges but positions them to gain firsthand knowledge of business needs. That knowledge enables the colleges to fine-tune their regular career education programs.

Major automakers such as Nissan, Ford, Toyota and General Motors contract with community colleges for technical and managerial staff training. In the case of technical training, the companies provide materials—tools, engines, drive trains, entire automobiles—as well as product documentation and syllabi. The companies exercise complete control over what is taught and what procedures and tools are used. Many auto dealers also contract with community colleges to develop apprenticeship programs to train technicians for their service departments.

The automotive industry is not alone in partnering with community colleges. The trend among major U.S. companies is to close their on-site training centers and move everything to community colleges. Examples are Caterpillar and Boeing.

### *Community Colleges and Applied Research and Development*<sup>16</sup>

The telecommunications industry has undergone unprecedented worldwide growth during the past few years, and even greater technological advances are predicted for the years ahead. The breathtaking advances in the industry’s growth—jump-started by the advent of the Internet and the Telecommunications Deregulation Act of 1966—have created an exciting new world of formerly unimaginable possibilities. But that new world presents the formidable challenge of educating enough people in the field of telecommunications to maintain America’s competitive edge in the global marketplace.

Community colleges have responded to this challenge in a variety of ways; some have even become leaders in the field of technology education. The two areas in which the most technology-minded community colleges have contrib-

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<sup>16</sup> See Dunn (2000)

uted to advances in technology are curriculum development and program improvement. Curriculum development involves the design and implementation of new curricula, courses, laboratories and instructional materials. Program improvement encompasses faculty and teacher development, student academic support, and formal cooperative arrangements among educational institutions, government agencies, businesses and industries, and other partners.

*The Northeast Center for Telecommunications Technologies.* An especially good example of leading-edge development in technology education is the Northeast Center for Telecommunications Technologies (NCTT), headquartered at Springfield Technical Community College in Springfield, Massachusetts. NCTT is addressing the need for technicians by designing and implementing a new model for telecommunications technology education that can be applied regionally, nationally and, perhaps, internationally.

NCTT is a consortium funded by the National Science Foundation, business and industry, Springfield Technical Community College, and participating higher education institutions. It comprises 14 community colleges (located in all of the six New England states and New York), five four-year colleges and universities, 14 high schools, 16 telecommunications corporations, state education agencies, and academic professional societies and organizations. NCTT's objectives are to develop, test and disseminate a new 2 + 2 + 2 curriculum in lightwave, networking and wireless technologies.

NCTT aims to be a catalyst in building an educational framework to meet the growing demand for highly skilled telecommunications technicians and engineers. As of the spring of 2000, 18 programs at NCTT partner and affiliated colleges and schools enrolled approximately 3,000 students. Some 500 faculty members and guidance counselors from throughout the northeast have attended workshops on technological developments and the job market.

The NCTT curriculum is being published in conventional as well as multimedia formats and delivered using a variety of state-of-the-art instructional delivery mechanisms (e.g., virtual laboratories and online courses). Three math, three science and two telecommunications courses (approximately ten modules each) are already on the web, while another 100 modules were scheduled to be online by 2002.

NCTT is developing an online competency profile for the Associate in Science (A.S.) in telecommunications curriculum. The profile provides detailed

curriculum information that serves as a template for curriculum design and implementation. The program is also developing a curriculum for the A.S. and the B.S. in Engineering Technology accreditation criteria of the Accreditation Board for Engineering and Technology. The curriculum and the program are being assessed by industry representatives by means of questionnaires and, indirectly, through internships for both faculty and students.

NCTT has made significant progress in meeting its goals and objectives and promises to be sustainable beyond the initial period of funding from the National Science Foundation.

## DIVERSIFYING POST-SECONDARY EDUCATION IN LATIN AMERICA: LIMITS AND POSSIBILITIES<sup>1</sup>

Enrollment in Latin American schools at all levels has expanded significantly since the Second World War and continues to do so. Secondary education gross enrollment at the regional level increased from 50.9 percent in 1990 to 62.2 percent in 1997, and the tertiary education ratio went from 16 percent to 19.4 percent (UNESCO, 2000). This expansion has resulted in qualitative changes in post-secondary education, which has become less elitist and more accessible to the masses. The downside of greater access is that higher education is no longer an automatic ticket to high social standing, as it was in the first half of the 20th century.

On the one hand, occupational fields have become more complex and have demanded different kinds and levels of workers. On the other, as has happened elsewhere, filters have been established to maintain some features of the previous status quo or to direct some groups to the most prestigious occupations. Like new wine in old bottles, higher education systems have undergone significant changes, leading to many approaches to education where before there had been only a few (see Clark and Neave, 1992).

As in almost any arena, educational institutions vie for prestige, resources and power. Traditional institutions strive to maintain their privileges and to avoid or slow diversification. This is becoming more and more difficult, given the increasing diversity of Latin America's post-secondary education clientele and the labor market.

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<sup>1</sup> Portions of this chapter are taken from Levy (2000).

There are severe limitations regarding available data on the size, structure, growth and financing of short-cycle post-secondary education in the region. This shortcoming makes the task of analyzing data and identifying trends in this sector a difficult one. However, this chapter attempts to provide an overall picture that highlights the urgent need to meet the growing demand for access to quality short-cycle post-secondary education throughout the region. Short-cycle higher education has expanded in many regions of the world, resulting in increasing enrollments in OECD as well as Latin American countries. All of the countries in Table 2.1 except the United Kingdom experienced increases in participation in ISCED 5 programs (i.e., post-secondary programs leading to awards not equivalent to first university degrees), and all saw expansion in post-secondary education in general. The percentage of women increased in post-secondary education as a whole, as well as in ISCED 5 programs. However, the opposite happened in Japan, where the clientele of the junior colleges that formerly trained 18 to 20-year-old women for short careers became more male. In Canada, men became the majority in short careers, while the overall proportion of women in post-secondary education increased.

Latin America has a mixed record. The proportion of ISCED 5 students among the total number of post-secondary students decreased, even though the proportion of ISCED 5 students among the total number of students at all levels increased. Colombia experienced a small increase, while Mexico did not begin offering these programs until the 1990s. Data by gender indicate only small changes in female participation in total post-secondary education and in ISCED 5 programs. Mexico is an exception, with women representing 64.3 percent of the students enrolled in short programs. In general, female participation in all types of higher education programs is increasing.

Venezuela, which was not included in Table 2.1 because of missing data, had a proportion of 14.5 percent of enrollment in ISCED 5 programs in 1985 and reached 34 percent in 1996-97 (Bruni, 1996). Data from Brazil—a late starter in such programs—are limited and partial (dating from 1999). Countries like Bolivia and Paraguay have not ventured into the field.

Although data are often missing and too general, Table 2.2 shows that OECD countries have invested heavily in tertiary-type B education (careers up to two years), considering the enrollment both in public and government-dependent private institutions. In addition, some Latin American countries—particularly



**Table 2.1. Enrollment in ISCED 5 and Total Post-Secondary Education:  
Female Participation in Selected Countries**

Country	Year	Percent enrollment				
		ISCED 5/ Tertiary education	ISCED 5/ Total enrollment	Tertiary ed./ Total enrollment	Female participation	
					ISCED 5	Tertiary ed.
Chile	1996	22.9	2.3	10.1	44.0	45.5
	1984	28.3	1.8	6.2	44.9	42.7
Colombia	1996	19.9	1.3	6.6	51.3	51.9
	1985	18.4	1.1	5.9	51.8	52.4
Mexico*	1994	9.7	0.5	5.4	64.3	47.4
	1985	-	-	4.7	-	37.9
Canada*	1995	44.4	10.8	24.4	49.3	53.2
	1985	20.3	3.5	17.2	51.8	52.4
France*	1993	22.2	3.1	14.2	52.9	54.6
	1986	17.4	1.7	9.7	47.3	50.6
Japan*	1994	32.4	5.2	7.1	68.0	44.0
	1984	17.9	1.5	8.6	85.1	34.9
United Kingdom*	1996	25.0	3.3	13.3	56.0	51.8
	1986	35.3	3.5	9.9	51.0	46.2
<i>Source:</i> UNESCO (2000). The selection of countries depended on the availability of data. * OECD member.						

Mexico and Argentina—have made a remarkable effort, getting close to the OECD member levels.

Data on direct and indirect expenditures from public and private sources suggest that tertiary-type B education represents a small but by no means negligible percentage in relation to the total of all educational levels and to all tertiary education (Table 2.3). Though not available in this data set, enrollment in type A is much higher than type B, as evidenced by Table 2.1. Therefore, the trend is that the unit cost is lower for type B than type A, allowing access to a greater number of students.

**Table 2.2. Students in Public and Private Institutions in Tertiary Education, 1999**  
(In percent)

Countries	Type of institution					
	Tertiary-type B			Tertiary-type A		
	Public	Government dependent-private	Independent-private	Public	Government dependent-private	Independent-private
OECD mean	71.0	16.7	12.3	77.5	11.4	11.1
Argentina	62.5	27.0	10.5	84.9	-	15.1
Mexico	100.0	-	-	71.3	-	28.7
Peru	50.4	1.0	48.6	48.7	-	51.3

Source: OECD (2002)  
Note: Type A: careers over two years. Type B: careers up to two years.

**Table 2.3. Direct and Indirect Expenditure on Educational Institutions by Public and Private Sources, 1998**  
(Percent of GDP)

Countries	Tertiary education			All levels of education <sup>1</sup>
	All tertiary	Tertiary-type B	Tertiary-type A	
OECD mean	1.3	0.3	1.1	5.5
Argentina	1.1	0.4	0.7	4.8
Chile	1.8	0.2	1.7	6.2
Mexico	0.9	-	0.9	4.7
Peru	1.3	0.3	1.0	5.0

Source: OECD (2002).  
<sup>1</sup> Includes undistributed and advanced research programs.

Net entry rates to tertiary education (Table 2.4), defined as the sum of net entry for each single year of age, reveal that youths prefer tertiary-type A education (careers lasting three or more years). However, the numbers for tertiary-type B are relatively high. Moreover, available data from Latin American countries are even higher than the mean for the OECD, at least for type B,

**Table 2.4. Net Entry Rates in Tertiary-type A and B Education in Public and Private Institutions, by Gender, 1999**  
(In percent)

Countries	Tertiary-type B education		Tertiary-type A education	
	Men & women	Women	Men & women	Women
OECD mean	15	17	45	48
Argentina	26	37	51	57
Chile	15	14	37	35
Mexico	1	1	24	22
Peru	18	21	15	-

Source: OECD (2002).

particularly for Argentina and Peru. Both types of tertiary education in general are more accessible for women than for men.

Completing these data, the expected years of study under current conditions in tertiary education are more favorable to type A (Table 2.5). The 1.9 years mean corresponds to about half of four-year and one-third of six-year careers. Taking into account that careers up to two years are included in type B, as already mentioned, the value for the OECD area means that the expected years of study correspond to around 20 percent of this type duration. Latin American countries included are below the OECD mean for tertiary type A-education, whereas the opposite happens to type B. The most plausible interpretation is that the dropout rate is probably lower for short career students than for traditional career students. In other words, type B students are more prone to get a degree than their type A colleagues. Both in OECD and Latin American countries, women tend to reach higher numbers of expected years of study.

In sum, Latin America has had a complex experience, often inspired by American community colleges and by the French *instituts universitaires de technologie*. As the pressure to diversify increases, there is also a strong and explicit rejection of diversification, for ideological and other reasons. Consequently, the continent is a mosaic of failures, successes and, in some cases, ambiguous choices. But diversification represents a challenge that the continent can no longer avoid, since enrollment in higher education is fast moving toward 10 million, with more

**Table 2.5. Expected Years of Study in Tertiary Education in Public and Private Institutions, by Gender and Mode of Study, 1999**

Countries	Tertiary-type B education		Tertiary-type A education	
	Men & women	Women	Men & women	Women
OECD mean	0.4	0.5	1.9	2.1
Argentina	0.7	1.0	1.9	2.1
Brazil	-	-	0.7	0.8
Mexico	-	-	0.9	0.9
Peru	0.7	0.8	0.8	0.6

*Source: OECD (2002).*

than one in five people belonging to the higher education age group and prospects for significant increases. Roughly one-fifth of education budgets and 3 percent of total national budgets go to higher education, and the overall importance of sound higher education systems for economic, social and political development is increasingly recognized in leading international circles. Given the situation, it is difficult to deny that two-year institutions must play a key role, since they offer an approach to education that is being adopted worldwide and that caters to a growing clientele of students with more modest means. As the American experience has shown, short-cycle education is the entry door to higher education for upwardly moving families. To keep this door closed is tantamount to slowing down social mobility.

Yet, as will become clear in the following sections, post-secondary education has had a rough ride in Latin America. Not only does the region enroll a smaller proportion of the corresponding age in such programs—as shown in the previous table—but there are serious problems with the structure and quality of what is offered. The focus of the analysis here will be on courses usually lasting from one to three years in technical or business areas. Teacher training, often also a short post-secondary program, is a problem in itself and cannot be examined in conjunction with other courses. For that reason, it is not addressed in this study.

The overall generalization that short post-secondary courses in Latin America constitute an issue that needs attention should not lead us to believe that all is bad

and nothing has worked. The main message is that development is taking place—some programs are superb, others have misfired. Growth is chaotic, with a strong predominance of private institutions being created in the recent past under a vacuum of public policies and disciplined support from the government. There is no blueprint or master plan for development.

Surely, there is action and the moment is ripe for changes. But change could just as soon go in the wrong as in the right directions.

The next section examines the development of short courses in four of the more affluent Latin American countries. Subsequent sections address issues that cut across countries and seem to be at the root of the problems faced by higher education and, in particular, by short courses.

## The Mosaic of Successes and Failures

Higher education in Latin America has experienced successes and failures, progress and regress. Diversification has been both intentional and unplanned. Private institutions, in general, have occupied important niches, often those forgotten, rejected or reluctantly accepted by the official bureaucracy. The trajectory of Latin America's higher education has been different from that of the United States and Canada. In both northern countries, community colleges developed rather slowly and followed clear blueprints. Moreover, they always had clear and stable sources of funding, ample community support, a differentiated clientele, and strong relations with their milieus, particularly with private business.

This section examines the patterns of development of community colleges in Latin America. Venezuela drew both from the American community college model and from the French *instituts universitaires de technologie*. Chile based its non-university institutions on the American model, as did Mexico. Argentina and Brazil have had two waves of innovation. The first, in the 1970s, was explicitly inspired by the American model. Short careers were introduced, only to be rejected for social, ideological and efficiency reasons. In 1996, Brazil's new general education law opened the way for three alternatives that seem to be gathering momentum. And in Argentina, the *terciarias no universitarias* have had spectacular development under a relatively unregulated private market. In addition, a new law allows them to establish transfer schemes with regular university courses and adopt new names (*colegios universitarios*).

The choice of case studies presented in this chapter is a result of both intrinsic interest and availability of information. The countries chosen—Venezuela, Mexico, Chile and Brazil—are certainly representative of the region’s variety of educational traditions and patterns. However, the choice leaves out the smaller and the less developed nations in the region. With few exceptions, these countries have shown less progress in short-cycle education.<sup>2</sup>

### ***Venezuela: Institutos Universitarios de Tecnología or Community Colleges?*<sup>3</sup>**

Higher education has been traditionally perceived by the people of Venezuela as a vehicle of social mobility. For this reason, in the face of significant population growth and the massification of preparatory education in the late 1960s, the government opted for institutionalizing short careers (the equivalent of associate degree programs in the United States) as a way of expanding the capacity of the higher education sector. Short careers have experienced substantial growth, today accounting for 34 percent of total enrollment and 45 percent of new registrations in higher education.

#### ***Short Careers: Definitions, Institutions and Educational Orientation***

Short careers are generally offered in institutions that specialize in this type of training, commonly known as *institutos universitarios de tecnología* (IUT), *institutos universitarios* (IU), and *colegios universitarios* (CU). Nevertheless, some universities also offer a limited number of short careers as an educational option.

The education provided by the short-career sector is not homogenous, in part because it implements two different educational models—the French IUT and the North American community college—but also because those models have been “adapted” in varying degrees and magnitudes.

The first IUTs were developed with help from the French Office of Technical Cooperation, based on a model implemented in France in 1966. The predominant

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<sup>2</sup>See Bernsaconi and Uribe (2002) for some examples of Central American and Caribbean institutions that offer technical post-secondary education.

<sup>3</sup> Taken from Bruni Celli (2000).

careers offered by IUTs are those related to industrial technology; however, IUTs also offer careers in administration and accounting. With regard to educational orientation, Venezuelan IUTs follow the pattern of the French IUT. They offer a practical, terminal degree; the focus is theoretical only when theory is required to solve concrete technical problems (CERPE, 1983). Programs are designed to be completed relatively quickly and to have immediate application in the workplace (Sauvage, 1978).

The first CUs were designed to follow the model of the North American community college. Instead of quick preparation for the workplace, the initial objective was to offer programs that would enable people to continue on to professional careers (CERPE, 1984). This concept failed because of the low university acceptance of the credits obtained in the CUs. Therefore, to increase student demand in this sector, the CUs have been progressively changing their orientation in the direction of terminal programs that are better defined from an occupational point of view. Today these institutions tend to look more similar to the IUTs in the occupational options offered. Nevertheless, in general terms, the CUs continue to differentiate themselves from the IUTs in two respects: (1) they tend to offer careers related to the service sector of the economy rather than industry; and (2) they place greater emphasis on the general education of the student than on narrower occupational-related skills (CERPE, 1984).

The IUs, developed later, consist of a diverse set of institutions that do not fall under the categories described above. They cover a wide range of areas not related to traditional industrial technology or administrative occupations, e.g., special education, music, art, theater, police administration, religion, military training, and physical education.

### *Origins of the Sector and the Underlying Educational Concept*

The first specialized institutes to offer this form of education were founded in 1971, although the underlying idea had been under development for many years.

The concept of short careers was developed toward the end of the 1960s at the Universidad de Oriente (established in 1959) and the *Universidad Simón Bolívar* (established in 1967). Established as “experimental universities,” these two institutions were not obligated to follow the structural organization of the “university-school” established by the national universities law. Instead, they

were organized as a group of departments that simultaneously served diverse programs without ascribing to a particular university. Free from the complicated approval processes that the organization of the traditional university imposed on every attempt to change curricula, and free of the traditional concept of “profession” that dominated the universities, these colleges could experiment with a variety of new curricular programs (Pérez Olivares, 1971).

Among the curricular innovations tried by these two universities was that of the so-called short career. The idea for this mode of education originated at the *Universidad de Oriente* (UDO), where there was interest in offering professional improvement through extension programs to local industrial workers. Afterward, the focus shifted toward giving the traditional (terminal) technical schools an option for offering higher-level studies. Under the supervision of the *Oficina de Cooperación Técnica Francesa*, UDO offered its first associate degree programs in 1967 (CERPE, 1983).

Meanwhile, since its foundation in 1967, the *Universidad Simón Bolívar* (USB) had been set up not only to confer degrees in diverse branches of engineering but to train professionals oriented toward solving practical technological problems. Because of that, the USB began to explore the option of short careers. After researching schemes from Europe, Chile and the United States, the university chose to adopt the French IUT system, which meant that the concept would be implemented at an institution other than USB. In 1971, the first IUT was established in Venezuela under the supervision of the UDO (Coello and de Roche, 1984; CERPE, 1983).

### *Institutionalization of the Short Career Sector in Higher Education*

The practices of UDO and USB were still in their early stages when, in 1969 and 1970, a rapid succession of legal reforms (Decree 120, 1969) resulted in the official closing of the traditional technical schools, and the new university law (1970) established “institutes and university colleges.” Thus, the short-career sector was not born and gradually raised within the existing educational structure; it was deliberately created in 1970 within the context of a broad reform of the country’s technical education.

This reform was an attempt to respond to a series of factors that by the end of the 1960s were exerting pressure on the educational system. First, there was



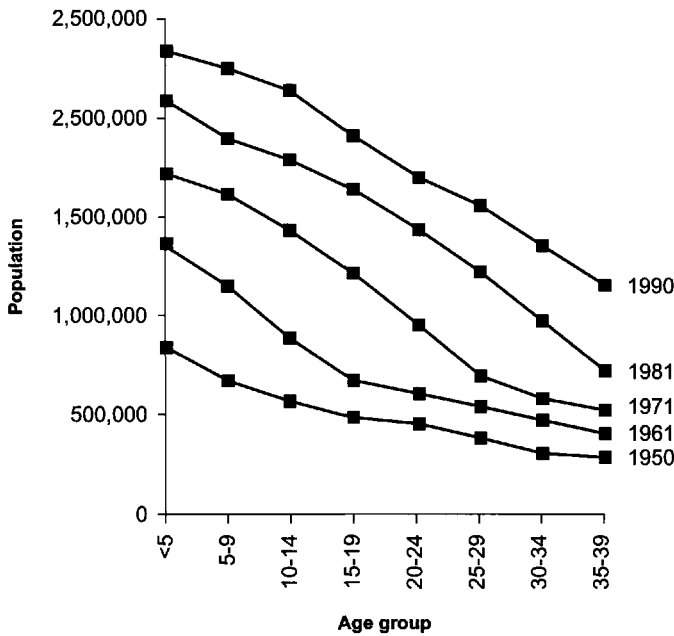
strong philosophical and social criticism of the traditional system of technical education. Between 1945 and 1969, technical education was provided by *Escuelas Técnicas Industriales* (ETIs) and *Escuelas Técnicas Comerciales* (ETCs), entrance into which required completion of the sixth grade. These schools offered terminal studies of six and seven years' duration, respectively. Although the quality of this form of education was not in question, the old system was criticized for its terminal character, which, its critics claimed, precluded its graduates from having access to higher education (Fernandez Heres, 1981). This was not totally correct, since some graduates had the option of continuing higher studies in the *Instituto Politécnico Nacional*. Nevertheless, the right to pursue higher studies was not automatic, so this criticism was kept afloat by those who argued that technical schools represented a classist modality of education, where second-class citizens did not have the option of pursuing higher education, understood as the only path to social advancement for the lower classes (Bruni Celli and Calzadilla, 1994).

The reformers proposed eliminating that scheme and implementing an alternative system based on a diversified bachelor's program that could offer a measure of technical training to those interested, and at the end of which every student would have the same right to continue higher studies. This entailed reducing the number of hours of technical education and focusing more on the general education of those who opted for technical emphasis at the high school level. Given this, it seemed logical to create a subsector of post-secondary institutions offering short careers geared toward the effective professionalization of technical personnel required for the productive sector.

The other important factor in the institutionalization of short careers in Venezuela was a mix of demography and democratic politics. Under the new democratic system initiated in 1958, there was determination to open secondary and higher education to the masses as a way of legitimizing the system. Figure 2.1 shows the demographic distribution of the Venezuelan population in the last five censuses. It can be seen that there was a big jump in the size of the population group aged 15 to 19 (i.e., around the age of college admission) between 1961 and 1971. The growth of that group was three times higher than during the previous decade.

Within this demographic context, the government was forced to massively expand both secondary and university education, to a large extent as a means of legitimizing the recently established democratic regime. The massive expansion

**Figure 2.1. Demographic Pressure on the University Sector**



of secondary education during the first democratic decade is evidenced by the fact that between 1957 and 1968, enrollment in public high schools and industrial technical schools went from 23,678 to 187,786 and from 3,270 to 39,115 students, respectively (Bruni Celli and Calzadilla, 1994). The traditional system of higher education could not respond quickly enough to the growing demographic pressure on conventional universities. Meanwhile, as a massified form of post-primary education, traditional technical schools proved to be extremely costly with respect to both equipment and human resources, as their teachers, many of whom were brought from abroad, were no different from the university professors either in educational levels or salary ranges. Thus, traditional technical schools, in addition to being subjected to heavy philosophical and social criticism, represented, from the point of view of cost and resources, a real barrier to the massification of technical and post-secondary education.

In summary, the short-career sector at the higher education level began as an initiative in curricular experimentation at two university campuses where

alternatives were explored to meet the needs of qualified industrial workers. At the end of the 1960s, the initiative seemed to offer great promise for further development. However, short careers were institutionalized suddenly as part of a deep educational reform intended to solve problems stemming from demographic pressure, the necessity of massifying education as a means of “legitimizing” the democratic system, and strong ideological criticism of the traditional system of technical education.

### *The Chilean Hierarchical System<sup>4</sup>*

The term “short career of higher level” is used in this section to refer to a formal program of post-secondary education of up to three years, while the typical duration of a short career in Chile is two years. Although in Chile these programs can be called “technical careers,” and here this term will be used as a synonym for short career, only about 40 percent of the students in short careers study “hard” technologies linked to the industrial and agricultural sectors, while the rest of the students focus on careers in computers and the service sectors.

Before the 1980 higher education reform, short careers in Chile were offered by some of the eight then-existing universities (especially the State Technical University), by the *Instituto Nacional de Capacitación Profesional* (INACAP) (which specialized in occupational courses), and by numerous academies and institutes that operated alongside the formal education system.

In addition to enabling the creation of private institutions of higher education, the reform tried to differentiate supply, allowing for the creation of two new types of institutions: technical development centers (*centros de formación técnica* [CFT]), which were to specialize in two-year careers, and professional institutes (*institutos profesionales* [IP]), which trained professionals in programs of four to five years in areas other than law, medicine, engineering and 14 other specialties that the law reserved for universities. The IPs were authorized to offer training for higher-level technicians in two-year programs. The universities remained authorized to offer all types of programs, from short careers to doctorates, including professional careers originally under their umbrella, along with careers not reserved for or offered by professional institutes.

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<sup>4</sup> This section is taken from Bernasconi (2000).

Short careers of at least two years now lead to the “higher level technician” degree. The universities apply the term “university technician” to graduates of some of the short careers they offer as a way of giving more status to these programs, differentiating them from the technicians formed in CFTs and IPs, and pointing out the greater duration (three years) that university technical careers require. Nevertheless, the name “university technician” is not recognized by the law, which admits only the higher-level technician degree and makes no distinction between granting institutions.

All of the 118 CFTs and 63 IPs in Chile are private and can be for-profit under the law, which does not permit for-profit private universities.

### *Short Careers*

During the 1980s, the number of CFTs and their enrollment increased dramatically, reaching 161 centers with 73,000 students by 1990. CFTs became the country’s principal supplier of short careers. However, during the 1990s the demand for CFT training declined, as evidenced by a 40 percent decline in enrollment, from a peak of approximately 83,000 in 1993 to 50,000 in 1999. The number of CFTs also dropped from 161 in 1990 to 118 in 2000, a 27 percent decline (Foro de la Educación Superior, 1993).

Meanwhile, universities and IPs have increased their enrollment in short careers, but not enough to compensate for the decline in CFTs. Technical enrollment in public universities increased 23 percent between 1993 and 1998, from 9,834 to 12,099. The technical enrollment of all universities, public and private, was approximately 15,000. The IPs, which had 1,500 technical students between 1996 and 1998, reached enrollment levels of 12,000 in 1998 alone, according to Chile’s Ministry of Education.

Regarding the total number of technical students in universities, IPs and CFTs, there was a decline of 24 percent in enrollment in short careers, from 101,000 students in 1993 to 77,000 in 1999 (CFT Department, Ministry of Education, Chile).

This trend contradicts trends in most OECD countries, where there has been diversification of higher education and higher growth in technical professional nonuniversity short careers. The following causes have contributed to the decline in CFT enrollment: (1) a heterogeneous and, in general, low-quality supply; (2) weak Ministry of Education mechanisms to ensure quality; (3) lack of appropriate

funding, which limits the access of low-income students and investment in pedagogical resources; and (4) weak links to the workplace.

In addition to these problems, the biggest suppliers of short careers in Chile, INACAP and DUOC (with almost 50,000 students), both of which maintain IPs and CFTs, decided to transfer most of the students enrolled in the CFTs to their IPs. This decision was made mainly for convenience and marketing reasons: that is, both institutions discovered that, compared to an IP, the CFT institutional form imposes rigidities and inefficiencies on the supply of technical careers, and the CFTs enjoy less prestige than the IPs.

In conclusion, the explosive expansion of enrollment in Chilean higher education, particularly from the 1980s on, led to complex and hierarchical organization that included universities, IPs and CFTs. The freedom of the universities to move into any level and type of education is complete, since they may offer graduate programs as well as the most prestigious undergraduate courses. PIs are authorized to offer programs not reserved for the universities, lasting eight to ten semesters. They are permitted to receive official financial support and obtain autonomy if approved following the Higher Council of Education evaluation process. Finally, CFTs offer short programs lasting four or five semesters. They do not receive governmental subsidies, either as development grants or as scholarships.

This complex stratification system, planned by the military government, bears some similarities to the California Master Plan (1960), which established three strata of institutions: (1) the University of California system, which recruits the best secondary school pupils and offers programs at the level of professional and doctoral degrees; (2) the California State University system, which recruits less gifted pupils from high school and offers them less prestigious four-year degrees; and (3) the community colleges, which are open to all high school graduates. Despite the similarities, there are also some differences. In Chile, there is a partial overlapping of institutional roles, since the universities offer programs ranging from short careers to doctoral programs. In these unequal conditions, the disinherited sons are the CFTs.

Despite the influence of the American model, which is evident in the reforms adopted in the 1970s and 1980s (Fischer, 1979), professional institutes and technical centers can hardly be compared to community colleges, which receive governmental and entrepreneurial support to provide a wide range of services, including remedial education for the least talented students. Thus, the Chilean

system copies the organizational stratification of the American system but does not provide the generous support to the lower levels found in that country. Instead, it reproduces the Latin American tendency to stratify education by social class, in this case within the post-secondary education levels, increasing the burden of underprivileged students who have to pay full cost for an education that does not qualify for public subsidies.

## *Mexico*

Mexico has made excellent progress in non-university higher education. In the 1970s, Mexico experienced a huge and unplanned increase in higher education enrollment. Around 75 percent of the increase was absorbed by public universities, which grew significantly as a result (Kent, 1998). However, the external debt crisis of the 1980s led to severe financial restrictions within the public sector in general, including the universities, and adoption of a laissez faire policy with regard to the private sector. Although cuts in university budgets were not as severe as those suffered by other public institutions, real salary decreases caused the loss of the most talented faculty members and forced many to get a second job to survive. Scarcity of resources and internal struggles, the latter largely caused by the former, resulted in the decay of public universities and the elite flight to private institutions.

The 1990s brought a new discourse that was different from the “social welfare” model adopted in prior years. Some of the buzzwords in both the Salinas and Zedillo administrations were efficient management, relevance for the labor market, technology transfer, institutional diversification, curriculum reform, and performance evaluation. Instead of perpetuating the incrementalist trends of the past, funding policies became more selective; that is, demands for additional resources to fulfill traditional duties tended to go unanswered.

Rationalization became the watchword. Teachers received productivity bonuses on the basis of evaluations by students and peers. As a result of participation in NAFTA and the need to compete with Canadian and American professionals, graduates were assessed. Institutional autonomy was redefined solely on the basis of academic fields, and finances were tightly controlled. The public sector had to reduce its dependence on government; consequently, public universities—with the exception of UNAM—raised their formerly nominal stu-

dent fees. They also began providing paid community services and contracting with local businesses. An unofficial rule established that more governmental funds would be allocated to institutions that were successful in obtaining funds from nontraditional sources. The downside to increased efficiency brought by these policies was the increased disparities among regions and universities.

Institutional diversification was an important change brought about by the reforms. Several technological universities were founded in order to offer two-year post-secondary training related to regional labor markets. Policies determined that no new public universities would be established and that the expansion of the governmental sector would be limited to two-year technological universities and four-year technological institutes. The latter were designed to train engineers and administrators, under the control of the federal government. In fact, the only public university to open its doors in the 1990s, in the state of Quintana Roo, was composed of a technological institute and a teacher-training school. In contrast to the previous rigid control by the official sector, freedom for private institutions continued in the 1990s, and as a result, the private sector had ample possibilities to diversify. Nevertheless, the state committed itself to establishing technological universities and institutes as strategic changes in the educational system.

Two-year programs are thus a relatively recent and daring innovation, contrasting sharply with traditional Mexican higher education. There has also been a tendency toward academic drift, though some important differences between two-year programs and universities have been preserved. Since the early 1990s, however, expansion of two-year higher education has been notable. In 1992, there were only 428 students in three “technological universities.” By 1998, there were 11,714 students in more than twenty schools of the same type. The number of students increased to more than 29,000 by 2000, and the number was projected to increase to 37,750 the following year. Moderately higher figures emerge if two-year programs in higher education institutions that also have longer programs are added.<sup>5</sup> Still, all this growth comes to only roughly 2 percent of higher education enrollments.

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<sup>5</sup> Of over 30,000 students in 1999, more than 20,000 were in technological universities, nearly 3,000 in private institutions, 5,000 in state universities, and roughly 2,000 in military schools. An associate professional program of two years gives its own title. Data on years were simplified so that, for example, the academic year 1991-92 is taken here as 1992. The data are from Mexico’s Subsecretariat of Higher Education and Scientific Research.



The model for Mexico's technological universities is the U.S. community college, although the American roots are somewhat disguised. The idea behind the schools is to diversify institutionally and provide quick job access, contributing to local business development. The institutions are public, decentralized and linked to state government through agreements with the central government. The degree given is *técnico superior universitario* (equivalent to "level 5" of UNESCO's classification); there is an option for transfer to regular university programs. Data from 1999 suggest cost savings in the new system. The oldest technological university had an average cost of between 15,000 and 17,000 pesos per student versus the higher education average of 27,000. This means that the increasing demand for higher education can be met with lower costs. Some 68 percent of enrollments are in engineering and technical studies, 32 percent are in administrative and social sciences, and a fraction are in agricultural studies.

The feasibility and sustainability of these deep changes are related to political democratization and wider participation in the political system. The old higher education model was exhausted. The power of university unions declined, particularly as a consequence of anti-inflationary policies, so that strikes lost their meaning. The political and social environment has changed so much that the traditional *Partido Revolucionario Institucional* lost the recent presidential election, after many decades in power. The current administration may deepen educational change. As a matter of fact, the Fox political program does not call for a return to the past, but, rather, increased efforts toward modernization. In this context, it is likely that institutional diversification in higher education will be reinforced at the expense of the old academic models.

### *The Ups and Downs of a Latecomer: Brazil*

Brazil has had perhaps the most unusual development of short-cycle education. Change has come in two waves. The first was too early to fully succeed. The second took too long to get started, leaving Brazil behind other Latin American countries in the development of short-cycle courses. But, in between, a small, expensive and high performing set of institutions, working very closely with industry, prospered under the auspices of the network of federal technical schools and what is called the "S" System. Therefore, Brazil has a two-speed pattern. The planned and policy-driven official systems failed at first and are now being



revived, and two relatively small high-quality enclaves within public and semi-public institutions have been doing very well indeed.

### *Failed Attempts to Copy the American Community Colleges*

In the 1960s and 1970s, Brazil developed short careers in technology areas, mostly inspired by the American model, particularly engineering. In the case of teacher education, short careers were an expedient means of alleviating the shortage of qualified teachers for first-level education (lasting eight years). According to the rules, almost all the credits were transferable to four-year teacher colleges, so that knowledge and skill modules could be added in a cumulative process.

Nevertheless, all these experiments were abandoned, except for those conducted at the federal technical schools and SENAI, described in the next section. Two-year colleges for teachers were abolished by the General Education Act in 1996. The three-year engineering program met the same fate, but for different reasons.

Ministry of Education statistics show trends at the secondary level and their impact on the expansion plans of higher education. In 1999, Brazil had 52.2 million students enrolled at all levels and modes of education, distributed as follows: pre-school education, 4.2 million; elementary education, 36.2 million; secondary education, 7.8 million; higher education, 2.3 million; and others, 1.7 million.

Secondary-level education expanded considerably, with annual growth rate of 7.14 percent between 1994 and 1999. More than 1.5 million students completed this level in 1999, and it is anticipated that by the year 2007 this number will reach 3 million.

The growth of undergraduate courses was 28 percent between 1994 and 1998, as a result of the pressure on higher education caused by significant increases in enrollment at the secondary level. However, the percentage of the population between 18 and 24 years of age enrolled in undergraduate courses is still very low (15 percent). According to the goals established by the national education plan, it is estimated that this percentage will double during the next seven years, that is, it will reach 30 percent of the population of 18-24 year olds, similar to such countries as Argentina, Mexico and Chile.

At the undergraduate level, 37.9 percent of students attend public institutions while 62.1 percent attend private ones. Enrollment in private higher educa-

tion institutions increased by 36.1 percent over 1994-98, a significantly larger increase than that experienced by public institutions (16.6 percent). These data suggest that the expansion of higher education in Brazil will continue to be driven mainly by the private sector, following the trend established during the 1970s. This is one of the major trends of diversification in Brazil, namely, the privatization of enrollment, as well as the stratification of access to different courses. The most prestigious and expensive courses are offered by public institutions at no cost to students, while less prestigious and cheaper courses tend to be offered by private institutions, mainly for late-evening students. As expected, some private courses are very good and expensive while others charge less than an average private high school. There is a pronounced overlap between private and public institutions in terms of the achievement levels of the graduating students. While the very top schools are mostly public, the middle of the distribution is definitely mixed.

The growing sophistication of technology and management is expected to heighten the attractiveness of technological courses and (because they confer higher status) increase the motivation of students to finish secondary education.

Long-term tendencies cannot be assessed yet, since the first census of vocational or career education was conducted in 1999. But its results provide data about the dimensions of the technological level, that is, those of the higher education short careers. Although it is possible to underestimate the statistics, it is significant that enrollment in the technical or secondary level of education was equivalent to 9.2 percent of all higher education enrollment. The technological level reached 4.1 percent. These are very low proportions compared to any international standards. Yet, still unofficial data suggest that growth rates for these categories are very impressive.

The numbers also show that the primary source of financial support for technological education is the private school tuition paid by the students themselves (with the help in some cases of business sponsorship). The federal government is the secondary source.

The service sector attracted 71.9 percent of enrollment, the manufacturing sector 27.5 percent, and the agricultural and fishing sector only 0.6 percent. As can be expected, enrollment was concentrated in more developed regions, with more than three-fourths in the southeast and south. Students were relatively mature; the predominant age groups were 20-24 years old (16.5 percent) and 25-39 years old (13.7 percent). Only 7.5 percent of the students were less than 20 years old.

Historically, technical and vocational education in general has been a kind of male ghetto; this was confirmed at the technological level, with 67.3 percent of enrollment being men. The highest percentage of women is in the service sector (37.6 percent), which is in line with their participation in the overall working population.

In conclusion, enrollment in career education in general, and in technological education in particular, reveals that the number of students is small, keeping in mind the size of the working population and the generally low level of schooling in Brazil. Therefore, statistics suggest that there is much to do in terms of expanding and diversifying education at the post-secondary level.

### *Quality Enclaves: CEFETs and the "S" System*

Like many Latin American countries, Brazil has had considerable success in developing institutions capable of offering high-quality training for manual trades. During their initial years (beginning in the 1940s), SENAI and SENAC focused on developing the skills of lower- and mid-level workers in manufacturing, commerce and service industries. Typically, these are the classical manual skill occupations that polarize training systems all over the world (e.g. machinist, turner, auto-mechanic, electrician, carpenter, cabinet maker, brick mason etc.). Schools tended to be narrowly focused on this set of occupations and offered many or most of them in each unit, very much following the conventional patterns.

However, as the economy became more complex, a different pattern of schools began to emerge. Instead of offering a broad range of occupations for a relatively similar clientele, schools began to narrow the scope of the trades offered and specialize in some areas. New schools began creating targeted areas such as precision mechanics, welding, ceramics, printing, automation and mechatronics. The federal technical schools moved in parallel directions. The older ones covered a large range of occupations (usually the counterpart of the same occupations at the technical rather than the worker level). By the same token, the new ones have been more focused, for instance, in such areas as dairy, wine-making and chemistry.

As workshops and laboratories required larger and larger outlays, deploying resources on the original clienteles of these schools—youth—made less and less sense. Therefore, schools began to offer courses to a broader clientele. This

included short courses for semi-skilled workers, retraining and upgrading workers, and all possible varieties of training that could use the equipment and human resources available.

But schools also began moving upward to secondary technical education. The next step was the creation of technology programs (i.e., two to three-year post-secondary courses). This became a standard trend for SENAI, SENAC and the federal technical schools. Some schools continued their drift upward, offering engineering courses. A smaller number did not stop there and continued all the way to Master and Ph.D. programs. This is tantamount to vertical integration, so well known in industrial sectors. As a narrower menu of occupational families is chosen, clienteles are expanded to the limit, ranging from half literate workers to graduate students.

But this vertical integration did not stop there. These schools started to broaden the range of services offered. From standard courses, they moved to customized programs and then to other forms of support to enterprises. The first line of activities tended to be the deployment of laboratories for quality control for industry or for public organizations. Then came the manufacturing of special parts or troubleshooting industrial equipment. The next stage was upgrading machines, then information services and newsletters to firms, and finally R&D projects (see Appendix 4).

The upgrading of federal technical schools into CEFETs (*Centro Federal de Tecnologia*) illustrates this trend towards vertical integration. As technical schools acquire greater roles and move on to post-secondary programs, they can request a change in status, becoming a CEFET. The first CEFETs evolved in 1978 from three technical secondary schools, all located in the most industrialized areas of the country. The functions of a CEFET, according to the legislation, are to provide middle-level technical education; undergraduate programs for technologists and industrial engineers; teacher education programs for technical and vocational education; continuing education programs for professionals and the community; graduate courses in the technology area; and research programs in the industrial area.

CEFETs develop a distinct organizational culture that makes them different from the regular engineering schools, which are too theoretical and offer few hands-on activities. CEFET faculty members and students operate in a distinct atmosphere that is different from that of academic institutions.

The 1999 Higher Education Census reported that Brazil had 16 CEFETs offering 74 programs to 19,484 students. Like its counterpart SENAI, the CEFET system is sophisticated and costly.

Limited by public resources, the most selective CEFETs also expanded their services to obtain additional resources. Given the fact that their managerial autonomy does not allow them freedom to buy, sell, hire and fire, they initially used their parent and teacher associations to sell services and extension courses. But as revenues from these operations boomed, this became a cumbersome bypass, and controller's offices from the government started to complain. One CEFET school had \$10 million in revenue, all passing through its PTA. The typical reaction has been to create a parallel foundation to manage and handle the finances of these operations. A few schools generate revenues through the foundations that are greater than their budgets from the federal government.

The most outstanding CEFET is that of the state of Paraná. It has six campuses, each of which enrolls 1,500 students, ranging from illiterate workers to doctoral students. The priorities of CEFET Paraná are technological development and integration with the community, with the latter achieved by:

- Accommodating the needs of a broad range of students.
- Carrying out tracer studies to determine how graduates perform in the workplace and to identify retraining needs (subsequently integrated into the curriculum).
- Conducting meetings with top business representatives to exchange views regarding research and student placement and to hear the business perspective on the future of technology and how developments in technology should influence the training of professionals.
- Developing business incubation programs—there are 12 in the state capital alone—designed to parallel formal education, encourage student initiative and entrepreneurship, provide services for small firms and microenterprises, compile case studies of successful businesses for use in courses, and encourage students to develop business plans.
- Developing a program of rapid response to businesses (particularly small ones) that need help in technology integration. At any given moment there is a portfolio of around 200 ongoing projects conducted by students under the supervision of a teacher.

## *New Models of Short Post-Secondary Education*

After long years of stagnation and dysfunctional legislation, the General Education Act of 1996 provided clearer status and norms for the technologist courses and opened the way for two new alternatives. As a result, Brazil, a latecomer to diversification in Latin America, ends up with a complex, relatively flexible and modern system of one-to-three-year post-secondary courses, including (1) traditional secondary-level technical courses, which become, de facto, post-secondary programs in which students may enroll during or after completing secondary-level education; (2) technological education, which is legally equivalent to higher education; and (3) “sequential” studies (open-ended higher education programs) that consist of short programs made up of (supposedly) existing courses offered by regular higher education institutions.

In the area of professional (career) education, curricular reform of secondary-level technical courses has already been implemented. The major change has been the split in the technical courses. Previously, these were the traditional European-inspired programs combining the subjects that lead to a high school diploma with technical and vocational skills. This combination ended up distorting the original vocational role of technical schools, particular the better ones, operated by the federal government. In a country where secondary education is scarce and where high quality tuition-free public secondary education is even scarcer, combining a high school diploma with practical training for technical occupations became a liability. The high-quality academic program attracted students who wanted to prepare to pass examinations for the best universities, rather than prepare to work in whatever trade was taught in the technical side of the program. In the end, the schools were co-opted by the elites and had ten to twenty candidates per vacancy. They created entrance examinations and became, for all practical purposes, elite schools. Few students ever considered taking up jobs in the occupations they learned.

Therefore, the first part of the reform consisted of splitting the technical courses into two programs: regular academic programs, where the standard courses were to be offered (in the case of the federal schools, under a phasing out schedule), and technical programs as a stand-alone offering. The technical programs, unburdened of the high school program, were no longer of interest to the elites and became more easily available to those who indeed were interested in the skills taught.

The other new directives for these courses also represent a step forward in the sense that they allow for broad curricular flexibility. Previously, the courses followed national norms and regulations that determined titles, duration and the number of compulsory subjects. The new directives introduced an innovation that consists of adopting curriculum models based on the concept of “career competencies.” The students trained in these courses graduate with professional occupational profiles determined by the competencies acquired during the courses. To help orient the technical schools to the labor market, the Ministry of Education selected 20 areas, listing the professional occupational competencies pertaining to each. (An equivalent curricular reform is being implemented for the technology courses described in the next section and will use the same model of competencies by occupational area, allowing more articulation between technical and technological courses).

The earlier legislation attempted to create bridges between short-post-secondary careers and regular four- or five-year programs. As will be described later in this book, this effort did not work. This form of articulation has not received much attention in recent legislation. The new legislation, by contrast, tries to facilitate the transfers from technical to technological education—that is, from one-year courses to two- and three-year courses.

Another type of higher education courses covers technology. These courses are more structured than sequential courses and are a form of career education. They are offered by higher education institutions and by centers for technological education. This is a critical difference, because the *sequenciais* (sequential courses) can only be offered by institutions that are already accredited to offer a regular four-year higher education. The emphasis of technology courses is clearly vocational or preparation for specific jobs. They are designed to work in close articulation with the productive sector and last, on average, two to three years. Although legislation treats them as higher education courses, some universities deny their graduates access to postgraduate programs because, according to the universities, the technological curricula would not have enough theoretical content.

Technology courses began in the early 1970s as a result of a government initiative designed to break the monopoly of traditional university careers. The new courses satisfied the need to reconcile study and work and provided an opportunity to get free access to higher education. However, compared to the growth of university courses lasting four or more years, technology courses did



not expand significantly. This was due in part to the lack of public investment, but, mainly, to the fact that these courses did not occupy a well-defined place within the system of higher education. They always gave the impression of being lost in the middle of the road between secondary-level technical courses and university courses. Their curricula did not have enough theoretical content to be credited as university courses, and they lacked practical application to lead to immediate productivity in the labor market. As a result, in many cases, technology courses became orphan courses with no clear profile or fate.

Attempts to articulate technology courses with longer university courses were virtually fruitless. During the 1970s they were most often used to fill gaps in credits at institutions that offered short careers. At present, the consensus is that these courses are unsuitable as bridges between two modes of education that perform fundamentally different functions. The Ministry of Education acted correctly when it recently removed these courses from the purview of the Secretary of Higher Education and placed them under the authority of the Secretary of Secondary and Technological Education, which will be in charge of leading the curricular reform of technology programs. The secretary is trying to find a balance by means of a system of authorization of courses, accreditation and evaluation that will be independent of the model traditionally used for university careers.

Flexibility is an important feature of the 1996 General Education Act. One of the act's innovations, as already mentioned, was sequential courses. In spite of the original intention to use these courses to take better advantage of the unused capacity of higher education institutions and provide alternatives to other plans for continuing education, sequential courses opened a wide avenue for post-secondary education. According to the author of the act, this alternative is similar to a Brazilian version, freer and upgraded, of community colleges (Brazil Ministry of Education, 1998). The regulations following the act recognized two types of sequential courses: (1) specialized training courses, open to anyone, leading to diplomas, and lasting at least two years; and (2) complementary courses, open to anyone, variable in duration, and leading to certificates of study. In the first type, the institution offers a curriculum, while in the second the candidate proposes a plan of study, choosing a strand of courses within an area of knowledge already offered by the institution. The prerequisite for candidates is to have completed secondary-level education, but they can also be graduates seeking deeper or



further studies or, even more frequently, students who want to amplify or complement their studies.

The initiative to offer sequential courses is being led mainly by private institutions, both those with the status of universities and non-universities. The most recent higher education census does not have specific statistics, so it is not possible to assess results or to infer trends about acceptance of these courses. It seems clear, however, that public universities do not show a great deal of eagerness to invest time and money in this type of program. By contrast, the most aggressive private institutions are investing heavily in these courses and creating them at a fast clip.

Concerning the possibilities of articulation of these sequential courses with the traditional four-year programs, there are no problems from the legal point of view. Sequential courses can be used as credit hours for undergraduate courses, as long as they are part of the curriculum or are equivalent to those of the curriculum. Under the hypothesis of using the sequential courses to get an undergraduate diploma, the graduate of a sequential course has to go through a selection process usually applied to the candidates of the intended course. Once this program is passed, the student will be able to take advantage of studies from the sequential course, complementing them with the courses required to get the degree. However, it is still too early to say whether the credits from the sequential courses will be widely accepted, since the internal regulations of many institutions pose obstacles to recognizing studies done at other levels or institutions.

The future success of these sequential programs will depend much on the ability of higher education institutions, on the one hand, to appropriately articulate them with undergraduate courses and, on the other hand, to fine tune these courses in order to have a flexible curricular profile adapted to the new demands of the labor market. At present, students still are somewhat unsure, despite fast growth in enrollment. Students still look upon sequential courses with a certain lack of trust, unsure whether courses taken in one institution are valid at other institutions. Another disadvantage of sequential courses is that professionals (engineers, attorneys, journalists, architects, etc.) do not recognize them or give them full professional validity in the sense of accepting their diplomas in regulated occupations. This prejudice is exacerbated by the refusal of public universities to offer such courses, which reinforces the lack of trust within the academic environment and on the part of interested candidates. The excessive

regulation of the conditions under which these programs can be offered, which has been the prevailing tendency in recent years, can also be a factor inhibiting their expansion and jeopardizing the success of an innovative proposal. But thus far, there is still ample freedom to define and create them.

The odds for success for sequential courses would be better if they responded to the needs of the labor market rather than attempting to take on the curriculum features necessary to be considered for the hypothetical possibility of transfer to traditional careers. But the growth rate of these courses is nothing short of spectacular in the last three years. It seems that the reason they grow faster than the older technological courses has to do with the dynamism and aggressiveness of private higher education institutions, the most likely investor in post-secondary education. These institutions were allowed to create sequential courses without submitting a request to the Ministry of Education, as is the case with technological courses. Why would they bother to create a technologist program when sequential courses have more flexibility and do not require permission from a cumbersome public bureaucracy? It seems, however, that this complete freedom will be reversed in the near future.

### ***Summary: Motley Patterns of Growth, Motley Success***

The countries studied here show that no single formula has swept Latin America in terms of expanding post-secondary education. All countries have seen growing enrollment and some kind of explicit or implicit diversification. Some diversification grew out of public policies that influenced the planning of the process. In other cases, diversification was unplanned and was followed by laws and regulations, after private institutions occupied niches abandoned or rejected by the traditional system. The struggle between new and traditional patterns has always been fierce.

The U.S. community college has been a major source of inspiration. However, different solutions were adapted to different national circumstances. This recalls an old saying that educational systems do not travel well. Venezuela is unique because it involves the coexistence of two traditions, the American and the French. Chile is closer to the vertical differentiation that is so clear-cut in California, but has failed to give the money and status that the United States gave to community colleges. Argentina has had the *terciaria no universitaria* for a while

and now has added the *colegio universitário*, which allows a status upgrade to these very popular courses. The schools planned under new legislation bear some resemblance to the American junior college, being independent from universities. Brazil created three alternatives. The technical courses are a new version of the old secondary-level technical schools, now relieved of the secondary academic curriculum and, therefore, standing somewhat in limbo between secondary and higher education. The technological courses are stand-alone, two- to three-year courses at the post-secondary level. Finally, the sequential courses overlap with regular higher education. They are, in fact, a short program constructed from an assortment of regular courses offered by higher education institutions.

Enrollment in short careers is increasing in Venezuela, Argentina and Mexico, and even more rapidly in Brazil, a latecomer. In contrast, enrollment is declining in Chile as a consequence of a lack of prestige, public support and funding. In the following sections, some of the issues that reappear across countries will be taken up in greater detail. There are problems of inadequate or insufficient differentiation, status and power, and transfers from one level to another. Public/private issues are interwoven among these other topics.

## **Reluctant Differentiation and Private Growth**

For a variety of reasons, Latin America has managed to achieve a certain degree of both formal and functional differentiation in higher education. Some has come through central planning; some has come as a response to unplanned and largely undirected but explosive demands from students entering public higher education. But the most decisive change in the landscape of higher education has been the forceful increase in the share of private education.

### ***Real and Formalistic Differentiation***

Several countries have undertaken broad policy reforms that entailed the creation of alternative public universities designed to perform functions somewhat different from those carried out by most national universities, or to perform traditional functions differently. In Venezuela, Brazil and Mexico, for example, new public universities were granted varying degrees of autonomy to launch new fields of study, make more connections with the job market, operate with private as well

as public money, build departments linking teaching and research, improve efficiency, and tie compensation to performance. In addition, most countries have created governmental or other public research centers. Some of these initiatives have been successful, others not at all; in some cases there was more pretense than real effort at implementation.

Especially relevant to a discussion of community college-like initiatives is that most countries have also created networks of public and private institutions that are devoted mostly to teaching and training but are not “research universities” in the strict sense of the term. Data from the Latin American regional office of UNESCO for the mid-1990s show some 4,626 “non-universities” alongside 812 universities.<sup>6</sup> These institutions still trail the universities 2:1 in total enrollments, reflecting their typically smaller size. Roughly one-fifth of the higher education institutions are labeled “technological and other institutions,” as opposed to universities, polytechnic institutions, or teacher training institutions. But the definitions and criteria that determine whether an institution should be considered a “university” or something else are arbitrary and differ from country to country. Therefore, not much confidence can be put in such statistics.

Despite its considerable evolution over the past few years, there is less differentiation within Latin American higher education than may meet the eye. Perhaps even worse, the differentiation is often inappropriate and superficial.

Formalism is rampant. That is, institutions, departments, programs and personnel are put in place to serve distinct functions, yet fail to do so, regardless of appearances. For example, faculty members hired to teach occupational applications of academic disciplines eventually conform to the status quo of the institution and fail to offer any hands-on activities. And very often, “full-time professors” do not work full time at their university jobs.

For purposes of this discussion, the most relevant examples of formalism concern the failures of technical institutions of higher education to achieve adequate differentiation from non-technical universities. They are often victims of so-called academic drift, and for the usual reasons—to gain prestige, to

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<sup>6</sup> Peru shows a rapid rise of mostly open access to non-university higher education in the 1970s and 1980s, which still amounted to just 3 percent of total higher education by 1991. Meanwhile, general studies programs continue to be seen as mostly just an “additional filter” rather than as job preparation. See McLauchlan de Arregui (1994).

“improve” their clienteles, to secure public subsidies, and to place their graduates in jobs reserved for university graduates. Similarly, in pursuit of status and rewards, they often emulate programs that train students in the classic professions, especially engineering. In technical careers, this translates into teaching too much theory (or the appearance of teaching theory) and too few hands-on activities.

It is important not to exaggerate and thereby contradict our earlier assertion that considerable functional differentiation has developed. New institutions often offer something distinctive even if they are not distinctive in other ways. In the case of technical higher education, institutions such as Chile’s State Technical University (now the University of Santiago) and Argentina’s National Technological University differ from mainstream universities in that they focus on more technical and applied courses of study.

In general, two causes of inadequate functional differentiation can be identified. They form the two sides of the phenomenon of *isomorphism*, the process by which organizations come to be like one another.

Coercive isomorphism occurs where powerful actors, usually the state (but also the traditional public universities), impose rules and evaluation criteria that limit differentiation. Some combination of self-interest and genuine belief in the “best way” to do things is usually at play. The old, elitist European ideal—that the sole beacon of academic excellence is the conventional university—is very powerful in Latin America (though it is antithetical to the U.S. model of higher education). But Europe has outgrown its own concept, and non-university courses have increased to the point of completely changing the landscape of European post-secondary education. Thus, Latin America has the worst of both worlds. It has been incapable of implementing the old elitist model and ignores the new European patterns of non-conventional post-secondary education.

National legislation, funding policies and accreditation systems provide for a single formula in matters pertaining to administrative structure, admissions and staffing policy, degree requirements, and curriculum. Worse, they offer greater rewards to institutions that follow the traditional model, thus creating disincentives for differentiation. (The one saving grace is that, in Latin America, rules are often ignored or circumvented, effectively moderating the unreasonable pressure to conform to a single formula.)

One can perhaps say that isomorphism is the consequence and not the cause.

At its root lie power struggles between the old and the modern. Isomorphism is the response of the old entrenched interests to the pressures of the new or emergent interests. Incapable of containing the pressure to change, the old guard yields, conceding changes. But when implementation comes, its remaining power surfaces again, and change is tamed and directed to the formal, the surface, the irrelevant.

The other side of isomorphism is non-coercive. Many actors and institutions copy one another voluntarily, as a means of gaining social or professional prestige. They lack the ideas, information, incentives, resources, markets or courage to launch out in distinctive directions. This applies in many respects to most private institutions and technical institutions. And, like coercive national rules, non-coercive copying creates obstacles to community college development.

Although not all emulation is bad and not all differentiation is good, the evidence strongly suggests that the region suffers greatly from the lack of desirable forms of differentiation. In particular, post-secondary technical education is too close to the old academic models and too far from the markets. It has too much lofty, open-ended theory and too few practical applications and hands-on activities. Its duration is defined by legislation that treats dozens of occupations equally rather than according to their intrinsic complexity. Rules for hiring, paying and promoting faculty place too much emphasis on credentials and undervalue practical experience and the association between teaching and the labor market.

### ***Unplanned Differentiation: Growth of the Private Sector***

A critical tendency that will affect the shape of future short post-secondary courses is the powerful increase in the role of private institutions. They outnumber public institutions in each category. Although the private sector hardly existed before the 1930s, it has become formidable. In 1930, only Chile, Colombia and Peru had private higher education, and this accounted for only a small percentage of their total enrollments. By 1955, the figure had risen to 14 percent; it grew steadily to about one-third of enrollments by the mid-1970s and eventually to a mean of about 40 percent (taking into consideration all countries except Cuba).

Postgraduate enrollments in the private sector (where participation at the

postgraduate level had formerly been only modest) recently rose to one-fourth of all postgraduate enrollments. The increase has been especially noticeable in job-oriented “specializations” and master’s programs, as opposed to more academically oriented doctoral courses. Such figures are significant. On the one hand, they make Latin America perhaps the world’s leading region in the share of private institutions offering first-degree enrollments. (The share in the United States is only about 22 percent.) This development truly represents the force of change outside central planning. On the other hand, the vibrancy of growth in the private sector is especially relevant to prospects for the development of institutions that bear some resemblance to community colleges, since the thrust of this development is unlikely to come through the traditional public sector.<sup>7</sup>

Moreover, the growth of private higher education in Latin America changes the landscape of higher education in general, because it is usually very different from public higher education in many critical respects. One is the source of funding. Most public institutions have relied overwhelmingly on state subsidies, and, in most Latin American countries, tuition-free higher education is a hot ideological issue. By contrast, most private institutions depend almost entirely on tuition—except in the case of some high-end Catholic institutions in Chile. In fact, for most, tuition and fees cover the full costs. Private institutions rarely receive budgeted public subsidies, though some countries (e.g., Brazil) allow private schools and their faculty to compete for merit-based discretionary state funding for research. Another difference is that private governance typically involves tight control by owners, boards and their rectors. Public institutions, on the other hand, are much more vulnerable to pressures from students, teachers, and administrative staff unions. In addition, private institutions tend to have closer ties with the job market. Compared to the typical public university, the typical private institution has a greater chance of implementing the proposals under consideration here, i.e., a Latin American version of community colleges.<sup>8</sup>

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<sup>7</sup> In the United States, there is a heavy association of “community colleges” with the public sector of higher education and “junior colleges” with the private sector. Early on, junior colleges were prominent, but massification made community colleges (public) the overwhelming two-year subsector.

<sup>8</sup> See Levy (1986). The private sector also contributes greatly to differentiation because it is so internally variegated, with great differences across institutions. It is unclear how much community college development would replicate this feature.



## *The Crippled Public Sector and the Narrower Roles of the Private Sector*

This section has examined the institutional development of short courses in Latin America. The creation of different modalities of short programs is, ipso facto, a form of differentiation. But differentiation has taken many shapes in Latin America. In some cases, it has been a purely formal exercise, changing names but not content. It has been either the result of planned and deliberate policies from the government or an unplanned evolution, resulting from the interplay of political, economic and ideological forces. But the shift in the engines of growth from the public to the private sector has been, perhaps, the most decisive transformation. Table 2.6 summarizes some of the discussion.

The task of understanding problems and patterns in this modality of education in Latin America is difficult because data are sparse and hard to interpret—as is true of technical education in general. It is often unclear which data on technical institutions refer to two-year institutions or which data on post-secondary education in general refer specifically to two-year programs. Moreover, much of the two-year study programs mentioned in available statistics are only partly relevant to this discussion. Some programs consist of general studies or prerequisites to professional study in the same institution rather than components of a true market-oriented program.

Most of the factors that have undermined the development of functionally differentiated two-year institutions in the past persist, as do the hurdles to functional differentiation within Latin American higher education as a whole. Norms and interest groups associated with the conventional university model remain strong. Rigid legislation continues to be applied. The situation is sometimes aggravated by frequent shifts in accreditation systems. Meanwhile, other policies, not specifically targeted against differentiation, have pernicious effects. For example, easily accessible and heavily subsidized public institutions of longer duration limit individuals' incentives to pay for a less prestigious, shorter cycle. These problems must be addressed if two-year programs are to be developed and sustained across the board.

Why has there been a delay in the development of community colleges? We can answer with only informed speculation. One likely reason is the persistence of the basic obstacles to functional differentiation in general cited above, along with obstacles to differentiation in the form of two-year institutions.



**Table 2.6. Latin American Models of Diversifying Higher Education**

Countries	Differentiation	Institutions/ Alternatives	Models	Functional overlapping of institutions
Venezuela	Unplanned	University technological institutes, university institutes, and university colleges (specialized institutions)	Community colleges and French IUTs	Sometimes
Chile	Planned	Professional institutes and technical education centers Community colleges	Community Colleges	Yes
Argentina	Unplanned	<i>Terciarias no universitarias and colegios universitarios</i>	British "university colleges"	Sometimes
Mexico	Unplanned		Community colleges	Yes
Brazil	Planned	Three different models	Different roles of community colleges	Yes

Another reason two-year programs have not flourished appears to be the abundance of alternative forms of low-cost higher education that conform to traditional patterns. These include some forms of public education, where students pay only nominal amounts. On the private education side, they include institutions that charge high tuitions and offer high caliber education as well as others that offer low quality at low prices. It remains unclear why entrepreneurs, philanthropic or not, have failed so often to offer credible two-year programs that are reasonably priced and well targeted to the market.

An additional reason for the lack of private community colleges lies in start-up problems. There is a scarcity of models, information and know-how, particu-

larly for smaller institutions. There is also a scarcity of capital to defray the costs of developing texts, curricula and syllabi, training teachers, equipping laboratories, and providing everything else needed to launch programs in uncharted careers. Fortunately, this is changing. Several Latin American private universities have shown extraordinary entrepreneurial initiative and skill in expanding their markets. Some of those institutions may be ready to invest in community college development.

There are good reasons to believe that the development of institutions inspired by community colleges would be a worthwhile undertaking. Such development would be consistent with contemporary trends in higher education reform. If international experience teaches us any lessons, community college development represents the next step in positive change and differentiation in Latin American higher education.

This book has also argued that many of the ills of Latin American higher education derive from inadequate differentiation. This, too, points toward the development of community colleges. The recent history of Latin American higher education suggests that systemic change can often be brought about more easily through the creation of new institutions than through attempts to reform existing institutions.

Finally, the development of community colleges would allow other higher education institutions to better perform tasks regarding which they have comparative advantages, since they would be unburdened of students who are more interested in short programs with a clearer job orientation. The development of serious courses of shorter duration and a vocational nature would allow academic higher education to better focus on tasks that include research, training for more sophisticated occupations, general education, and any other area that lies outside the purview of short programs. Clearly, the development of institutions like community colleges would help Latin American higher education reach and maintain a more adequate level of functional differentiation.

### ***Summary: Persistent Problems and Growing Hopes***

To sum up this section, Latin America has seen important changes in the landscape of higher education. The public sector has tried to create alternatives to the old model of highly academic institutions and move closer to practical

endeavors and closer contacts with the labor market. But in many (but by no means all) cases, the transformations have been resisted and the changes have ended up being in style rather than substance. In fact, the constraining regulatory framework does not favor real differentiation and makes the desired changes much more arduous. The old institutions resist change and the new emulate the old. The most drastic changes have been an increase in the share of private education. The chronic constraints in funding the public sector and the explosive growth in the private sector have serious consequences for the development of short post-secondary institutions. In most cases, it means that whatever will happen in this category of education will take place under the flag of private institutions.

This is in stark contrast to the American pattern, where community colleges have been ushered in by the public sector and with public money. If in the United States, community colleges—as they are now—only exist under public ownership, it is difficult to believe that they could be viable in Latin America without public funds. And since growth in higher education comes mostly from the private sector, whatever short post-secondary courses emerge cannot be too close to their American counterparts. More than likely, they will have a narrower menu of services offered and will look more like the private technical education institutions in the United States, corresponding to the “career education” category described earlier.

Latin America has traditionally lacked many of the market conditions and higher education policies that support U.S. community college development. It has also lacked certain key factors that account for Europe’s development of two-year institutions.<sup>9</sup> But Latin American higher education policies also show clear trends toward promoting development of institutions similar to community colleges. Among those trends are the following:

- The environment has become more favorable. At the broadest level, internationalization has invaded higher education, and Latin America has especially opened up to U.S. models and influences. Whereas identification with the United States used to clash with nationalistic

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<sup>9</sup> Although many European two-year institutions have yielded to the pressure to become more like universities, Latin American institutions are much weaker than their European counterparts.

ideologies, today it has become more accepted. Major political and economic changes, often scorned as “neo-liberal,” but effectively enforced, support the development of institutions along the lines of community colleges. Included among these changes is the growing participation of business in shaping education policies.

- The changing political and economic environment goes hand in hand with changes in higher education policy and structure. The ideological force of the all-encompassing, state-controlled university is yielding to the concept of state supervision, or pluralism, in which differentiation is fundamental—and is encouraged by policy. One aspect of the current political and economic environment that favors the development of community colleges is the shortage of public funds for higher education. Given that shortage, broader access and improved efficiency will not be achieved through repetition of the tired formulas of four, five and six-year diplomas.
- Parallel forces also come from below—the social demand for higher education is increasing as state readiness to finance public universities is decreasing. Today’s students are less wedded to the traditional higher education model. Most work and attend school at the same time, so the fact that the cost of two-year programs is exactly half the cost of four-year programs is significant for them. On average, students are older and more interested in education that is relevant to the workplace. This shift toward applied fields also favors the development of shorter courses. Perhaps as important, the proportion of the age cohorts finishing secondary education is increasing rapidly in just about all countries of the region. Simultaneously, skill demands have increased as a consequence of economic opening, technological innovation, and new requirements of competitiveness.

## The Status Game and Academic Drift

Schooling is subject to contradictory expectations—to select talents based on merit and, at the same time, to contribute to equality of opportunity. Moreover, different theories view schooling either as a means of democratization or as a process of reproducing inequality from generation to generation. Diversifying

higher education is the focus of voluminous discussions on democratization. Is a community college or similar institution a force for democratization, opening new alternatives for lower-status, less talented people? Or has it extended a class-based tracking system, as stated Karabel's classic 1978 article on latent class conflict?

This section opens a discussion of status and social stratification, examining particularly the effect of short careers in Venezuela (specifically, whether they make a difference for underprivileged youth). It also focuses on issues pertaining to the hierarchy of prestige within education ministries and on academic drift. It then moves to Chile, where a well designed classification of higher education institutions ended up as a mechanism that discriminated financially and politically against short-cycle institutions. The final section examines an exemplary technological institution in Brazil mentioned earlier: CEFET Paraná. The outstanding quality of CEFET programs used to attract select students, mostly from the higher levels of society. As the new regulation for technical schools removed the attractiveness of such courses for the elites, the response of the school was to create a technical course that prepared students not for the market, but instead for the longer and elitist technologist diploma. It thus avoided the "bastardization" of its student body.

### *Social Class and Choice of Careers in Venezuela<sup>10</sup>*

The rapid and continuous growth of the short-career sector suggests that short careers have been favorably received by Venezuelan society. It is possible, however, that the reason for the growth of short careers is not that they are increasingly preferred, but that they are the only option for some population groups. Confronted by limited admission to universities, certain young people—specifically, those who belong the lower tiers of the socioeconomic scale—are allocated to this sector in greater proportion than its demand. Before becoming alarmed, one must ask, what does it mean? Are we facing a system of discrimination or a system of opportunities?

This section analyzes the patterns of demand for and allocation of students to short careers according to the socioeconomic profiles of the individuals who try

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<sup>10</sup> Taken from Bruni Celli (1996).

to enter the post-secondary education system. Given that the data used are from the national system of allocations to the university sector, one must understand how the allocation system works and the nature of the information that the system collects and processes.

Young Venezuelans enter the sector through one of two paths—university entrance exams or the national allocation system of the National Council of Universities (CNU). Most institutions accept, at least partially, the national allocation system. Even institutions in which the dominant entrance criterion is the faculty or departmental exam take into consideration the academic index composed by the CNU.

The allocation is performed through a system of national pre-enrollment. Students who aspire to enter the higher education system must take exams on verbal and mathematical reasoning administered by the CNU, fill out questionnaires about family background, and pre-register in the system according to their top three preferences for careers and institutions. The CNU enters this information in the computerized system of the Office of Planning of the University Sector (OPSU). Afterward, the allocation is performed based on two criteria: academic index and economic status.

The academic index is based on three elements: (1) GPA for five years of (the old) secondary education, weighted 60 percent; (2) score on verbal reasoning, weighted 20 percent; and (3) score on math reasoning exam, weighted 20 percent (CNU, 1994). The calculation of economic status is performed using an adaptation of the Graffar scale, which classifies each student's status as high, medium high, medium low, worker, and marginal.<sup>11</sup>

The system allocates students to their first, second or third choices of career and institution according to their academic index, subject to consideration of economic status. For example, if a young man of higher economic status who also has a high academic index is pre-registered in mechanical engineering in a public university as his first choice and in a private university as his second, he is

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<sup>11</sup> This scale is based on five criteria, each one having a scale from 1 to 5. These criteria are: 1) employment of the head of the household; (2) level of education of the mother; (3) sources of income of the family; (4) living conditions of the family; and (5) income level of the family. Those who obtain an average lower than 1.5 on the scale fall below the category of "marginal;" those who obtain an average greater than 4.5 on the scale fall below the category of "high," and so on (CNU, 1994).

allocated to the private university if there is a candidate with fewer resources but the same academic index.

The data used in the analysis that follows come from the national system of allocation. The data do not reflect students allocated by the entrance-exam system. It is possible that entrance exams are closely correlated with the academic index; if this is the case, public universities with competitive admission policies would be accepting a greater number of individuals belonging to the wealthier classes registered by OPSU. But youths with fewer resources *and* low academic indexes have been accepted in highly competitive universities through the use of entrance exams.

Table 2.7 shows the demand structure and allocation applied by OPSU in 1996, referenced by economic status and academic performance. The data indicate that the lower the economic status, the greater the demand for admission to short careers (IUs, IUTs and CUs). At the same time, “marginal” status consistently shows greater demand for admission to longer careers than does the working class. Also, the lower the economic status, the greater the allocation to short careers. In 1996, only 10 percent of those in the “high” classification were allocated to the short-career sector while 52 percent of those classified as “marginal” were allocated to it.

The data in Table 2.7 indicate that allocation to short careers is greater than demand. Among students in “high” and “medium high” classifications, the difference is slight. Among students in the three lower economic levels, the difference is much greater. Among students in the “marginal” classification, allocation to short careers is more than twice the demand.

The pattern in Table 2.7 is consistent with correlations between academic indices and economic status. Table 2.8 suggests that the CNU allocation system favors students from the lower classes in the average required for entrance to public universities. However, the CNU exam requires a demanding level of performance such that young people with fewer resources, who, on average, have lower academic indices, are allocated more than proportionally to public IUs and CUs.

The data in Table 2.8 could be interpreted two ways. First, they could be seen as showing that the current system of allocation is unjust in that, by allocating socially inferior students to careers that offer limited income potential, it prevents talented people from improving their status. In this sense, the system tends to

**Table 2.7. Demand and Allocation in the Venezuelan Higher Education System**  
(In percent)

Demand	High	Med. high	Med. low	Worker	Marginal
Public university	75.33	79.69	76.39	73.96	75.23
Private university	16.90	6.95	3.16	1.69	1.58
Public IUT/IU/CU	5.16	10.09	16.80	20.46	19.48
Private IUT/IU/CU	2.61	3.28	3.65	3.89	3.71
Allocation	High	Med. high	Med. low	Worker	Marginal
Public university	67.65	67.34	57.05	48.42	46.12
Private university	22.36	10.12	4.55	1.59	0.85
Public IUT/IU/CU	8.32	20.07	35.84	47.57	50.69
Private IUT/IU/CU	1.67	2.48	2.56	2.43	2.34
Source: National admissions database, 1996.					

**Table 2.8. Academic Index by Economic Status and Institution**

	Academic index (AI) by institution					
	Public university	Private university	Public IUT/IU/CU	Private IUT/IU/CU	Total of AI allocated	AI of applicants
High	61.80	56.85	51.69	50.64	59.66	54.17
Med. high	61.23	55.34	51.60	50.39	58.43	52.32
Med. low	58.88	53.62	51.21	49.62	55.66	50.05
Worker	57.56	51.80	50.89	48.47	54.08	49.04
Marginal	58.40	51.02	50.90	49.45	54.32	49.10

perpetuate the current class structure. The second interpretation is that were it not for short careers, many young people would have *no* opportunity to enter the higher education system. Hence, even though the system may be somewhat discriminatory, it at least provides a way to advance.

The following two sections explore these two interpretations. The first analyzes the extent to which short careers present an economic advantage or



disadvantage in relation to long careers. The second considers the situation in which these young people would find themselves if, in the absence of short careers, they had no access to the system of higher education at all.

### *University Degrees vs. Associate Degrees in the Labor Market*

This section compares the occupational success (as indicated by unemployment and income) of people with associate degrees to the occupational success of people with regular university degrees.<sup>12</sup> Figure 2.2 shows that, during the last two decades, the proportion of associate degree technicians in the labor force has been increasing. The figure also shows that the population of associate degree technicians is, on average, younger than the population of regular university degree graduates. Since levels of unemployment are not independent of age, this second variable was discriminated when considering the first. The results are presented in Table 2.9, from which it can be seen that, during the last two decades, the rate of unemployment of associate degree technicians has been, with a few exceptions (noted by shaded areas), consistently greater than that of the graduates of universities, in all age groups.

Tables 2.10 and 2.11 present the results of regressions based on the human capital framework over many years. In all, the independent variable is the natural logarithm of individual monthly income. Some of the independent variables are experience, experience squared, sex, the natural logarithm of hours worked, years of education, and a dummy in which long careers are 1 and short careers are 0.

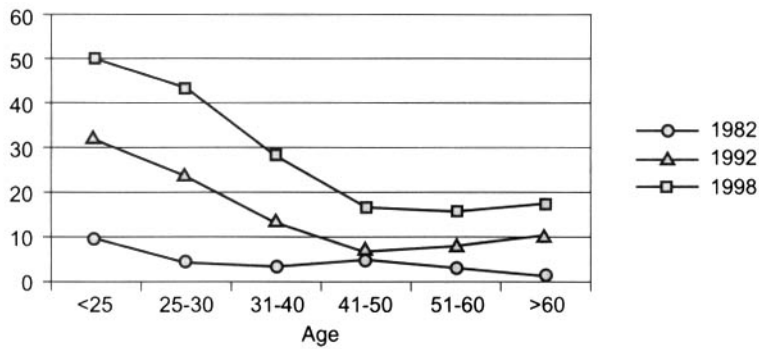
The regressions in Table 2.10 show the simple difference in income between technicians who have a college education (long careers) and technicians who have studied at the associate degree level (short careers). The results show that, in four out of the five years studied, a college graduate (long career) earns, on average, 14 percent more than an associate degree technician.

The regressions in Table 2.11 add to the equation the variable *years of schooling*, the purpose being to analyze the performance associated with each educational path, keeping in mind the time invested in education. The results show that, even though associate degree technicians earn less than college

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<sup>12</sup> The data used in this section come from the household survey (EHM).

**Figure 2.2. Associate Degree Technicians as a Percentage of All Technicians with Associate or Bachelor's Degrees**  
(In percent)



Source: Household survey (EHM), 1998.

**Table 2.9. Rates of Unemployment of Associate Degree Technicians and University Graduates, by Age Group, 1982, 1992 and 1998**

**Table 2.10. Regressions with Dummy for Long and Short Careers, 1982-98**

	1982	1985	1988	1992	1993	1996	1998
	R <sup>2</sup> =0.336	R <sup>2</sup> =0.355	R <sup>2</sup> =0.252	R <sup>2</sup> =0.256	R <sup>2</sup> =0.263	R <sup>2</sup> =0.120	R <sup>2</sup> =0.162
Constant	52.784	50.054	54.239	67.651	70.463	84.690	9.069567
Ln. hours	0.6916	0.7634	0.7981	0.7980	0.7562	0.6572	0.675757
Sex	0.1280	0.1717	0.1838	0.1775	0.1870	0.1630	0.181801
Experience	0.0542	0.0596	0.0470	0.0464	0.0444	0.0491	0.043135
Exp.^2	0.0009	-0.0009	-0.0007	-0.0007	-0.0006	-0.0010	-0.0007
Long career (=1)	0.1434	0.1120	0.1448	0.1424	0.1932	0.1403	0.133026

*Note:* All coefficients are significant to a level of 0.001.

**Table 2.11. Regressions: Economic Efficiency of Long and Short Careers, 1982-98**

	1982	1985	1988	1992	1993	1996	1998
	R <sup>2</sup> =0.48	R <sup>2</sup> =0.487	R <sup>2</sup> =0.351	R <sup>2</sup> =0.348	R <sup>2</sup> =0.376	R <sup>2</sup> =0.166	R <sup>2</sup> =0.212
Constant	31.887	26.261	36.197	48.679	49.383	62.515	7.371888
Ln. hours	0.6294	0.7398	0.7118	0.7579	0.7053	0.6374	0.601107
Sex	0.1506	0.1696	0.1750	0.1824	0.2095	0.1727	0.200089
Experience	0.0469	0.0541	0.0397	0.0375	0.0349	0.0377	0.038577
Exp.^2	-0.0008	-0.0009	-0.0006	-0.0006	-0.0005	-0.0008	-0.00064
Years of schooling	0.1664	0.1797	0.1587	0.1551	0.1730	0.1638	0.145711
Long	0.0205	-0.0570	-0.0417	-0.0842	-0.0396	-0.0749	-0.05828
Cases	11,279	15,471	8,412	12,477	12,388	3,064	4,010

*Note:* All coefficients are significant to a level of 0.001 except the one in italic, which is significant to 0.05.

graduates, the economic performance of those who make this choice surpasses that of college graduates in every year except 1982. This means that, in Venezuela, the economic performance associated with the choice of a short career is greater than that associated with the college career. The career areas of greatest performance are electrical and electronic technology, industrial technology, mechanical technology, and computer technology—all careers related to industry or new technologies.

In sum, graduates of short careers find themselves at a disadvantage with respect to college graduates in the labor market. Their unemployment rate is greater and, on average, they earn lower incomes. Nevertheless, given the differences in investment in years of education, short careers generally surpass long careers in economic efficiency.

Economic efficiency is a criterion of economists and not of the public in general. In society, the thinking is based more on fairness and equality of opportunities. From the social point of view, graduates of short careers encounter clear disadvantages relative to college graduates. Is this proven by the thesis of discrimination and perpetuation of class differences? The following section considers the “counterfactual,” that is, the situation in which these disadvantaged young people would be if there were no short careers.

### *Associate Degree vs. Secondary Education Degree Technicians in the Labor Market*

This section explores the situation in which disadvantaged youths with short careers would find themselves if there were neither short careers nor alternatives for entering higher education. Toward that end, it compares the success in the labor market of those who receive only high school diplomas with the success of those who receive degrees from higher education institutions.

Tables 2.12 and 2.13 compare the unemployment rates and participation in the informal sector of people with high school diplomas and people with college degrees. Note that the unemployment rates of people with high school degrees tend to be lower than those of people with associate degrees, but that their participation rates in the informal sector tend to triple those of the people with associate degrees. This pattern suggests in part that high school graduates are more inclined to work in the informal sector than associate degree technicians.

The first regression presented in Table 2.14 shows that in 1998 an associate

**Table 2.12. Rates of Informality of High School Graduates and Associate Degree Technicians, by Age Group, 1992 and 1995**  
(In percent)

		<25	25-30	31-40	41-50
1992	High school degree	39.32	49.26	59.89	60.55
	Associate degree	10.74	12.15	14.30	20.94
1995	High school degree	32.37	28.30	32.98	35.47
	Associate degree	7.71	8.92	7.65	3.68

Source: Household surveys (EHM), second semesters, 1992 and 1995.

**Table 2.13. Unemployment Rates of High School Graduates and Associate Degree Technicians, by Age Groups, 1992 and 1995**  
(In percent)

		<25	25-30	31-40	41-50
1992	High school degree	12.57	6.25	3.71	2.33
	Associate degree	20.30	9.85	4.73	0.00
1995	High school degree	22.15	10.67	7.75	4.50
	Associate degree	29.11	13.98	6.77	6.02

Source: Household surveys (EHM), second semesters, 1992 and 1995.

degree technician earned 41 percent more than a high school graduate. Incorporating a "dummy" in which "1" signifies work in the formal sector and "0" signifies work in the informal sector, an associate degree technician earns 39 percent more than a high school graduate. The decrease in this coefficient, combined with the fact that the coefficient of the formal variable is positive, indicates the presence of a bias in the first derivative equation of the correlation between being an associate degree technician and being in the formal sector of the economy.

The results in the tables above show that young people who complete short-career programs have a great advantage over those who have only high school

**Table 2.14. Relative Incomes of Associate Degree Technicians and High School Graduates, 1998**

	N=5,523	R <sup>2</sup> aj=0.164	N=5,513	R <sup>2</sup> aj=0.178
	B	Sig.	B	Sig.
Constant	9.3215	0.00000	9.3443	0.00000
Ln (hours)	0.5045	0.00000	0.4765	0.00000
Male=1	0.2861	0.00000	0.3038	0.00000
Experience	0.0395	0.00000	0.0364	0.00000
Exp*Exp	-0.0006	0.00000	-0.0005	0.00000
Assoc. degree technician = 1	0.4148	0.00000	0.3917	0.00000
Formal = 1	-	-	0.1956	0.00000

Source: Household surveys (EHM), second semester, 1998.

diplomas. Even if the mechanism for allocation to the higher education system discriminates on the basis of social class, short-career programs offer a valuable opportunity to young people with fewer resources by providing otherwise unavailable access to the higher education system and, as a result, access to higher levels of income and to the formal sector.

### *The Professional Ceiling: Institutional and Political Discrimination in the Business and Educational System*

Even though young people who attend short-career programs are better off than they would be if they had no opportunity to enter the higher education system, the fact remains that, compared to college graduates, they face a disadvantage in the labor market, since short careers impose a ceiling on their professional development and socioeconomic progress. This raises the question: What opportunities are available to short-career graduates (associate degree technicians) who seek socioeconomic advancement?

Associate degree technicians face two types of obstacles in their professional progress in Venezuela: ceilings imposed on their careers inside companies and limited opportunities for further study.

The Venezuelan system has created conditions under which the CNU acts

as a protecting agency of traditional careers against careers offered in “other institutions” such as IUs, IUTs and CUs. The CNU was responsible for the establishment of the 1983 norm according to which associate degree technicians could not choose the system of four-year degrees. Similarly, the CNU has rendered ineffective initiatives forwarded from the Congress to “integrate” the system of higher education. Decree 42 of 1979 established the creation of an “integrated sub-system of higher education.” The decree stated that the universities and the IUs, IUTs and CUs should develop integrated programs that allow the continuation of studies by associated degree technicians (Art. 2), and it contemplated the prompt preparation of a project of *reglamento de equivalencia de estudios y de reválidas de títulos* by the CNU (Art. 5). Such regulation never takes effect because of a strong opposition stemming from the university sector (Castillo Rojas, 1994).

In sum, although associate degree technicians’ inferior opportunities for growth in the labor market (compared to those of college graduates) might be attributed in part to a smaller investment in human capital, there is evidence that behind this there is also an element of discrimination based on the power of professional unions. Whatever the explanation, the reality is that to pursue better work opportunities, the associate degree technician must continue studying. But, in reality, there are no paths for professional improvement through the academic route. Associate degree technicians cannot opt for the system of four or five-year degrees, and, with few exceptions, universities do not give them study equivalents for the continuation of studies leading to the attainment of engineering or master’s degrees. This situation is a product of an institutional structure in which universities control the policies for the entire higher education sector.

In recent years, discussion of growth opportunities for associate degree technicians has reemerged. There have been developments in many directions. For example, faced with the open discrimination by the universities, some representatives of the institutes and universities have established their own “separatist” system of technical two-year degrees (IUT la Victoria, 1993; Castillo Rojas, 1994), which allows associate degree technicians to increase their investment of human capital through a nontraditional path. At the labor market level, this initiative stems from the hypothesis that the problem faced by associate degree technicians is, in fact, one of human capital. That is, proponents of this initiative assume that, with two additional years of education, the associate

degree technician could achieve greater potential productivity and therefore would have access to the best labor market opportunities. In the academic environment, the initiative stems from the hypothesis that universities could recognize the five years of study (3 plus 2) as sufficient to give associate degree technicians access to the traditional system of four-year degrees. Whether these underlying hypotheses hold true remains to be seen.

On the other hand, consideration has been given to the idea of modifying the current institutional structure. A new legislative proposal being discussed in the senate contemplates the creation of a national council of higher education that would rank above the CNU. This structure would eliminate both the duality and the lack of balance of power in the current system.

### *Conclusions and Political Implications*

Many young people who enter short careers in Venezuela do so *not* as a result of personal preference but because they lack resources and have inferior academic indexes.

Short-career programs are more cost-effective than four-year degrees. Nevertheless, on average, associate degree technicians earn less than holders of university degrees and are more likely to face periods of unemployment.

Associate degree technicians earn more than high school graduates and are more involved in the formal sector. Although they are more likely than high school graduates to experience unemployment at the beginnings of their careers, their employment opportunities surpass those of high school graduates as they gain work experience.

### *The Pecking Order within Education Ministries: Chile<sup>13</sup>*

The social stratification of knowledge, curricula and educational institutions is evident in the resource allocation processes within ministries of education and other ministries. As is well known, besides being able to improve equity, as in Venezuela, short-career programs are much cheaper than traditional universities. Faculties, facilities, curricula, managerial flexibility and relations with business

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<sup>13</sup> Taken from Bernasconi (2000).



and communities in general tend to reduce costs, making short careers particularly attractive, especially when the demand for skilled technicians is much higher than the available supply. In spite of these advantages, however, prestige, power and social hierarchy tend to favor classic university-style institutions at the expense of other kinds of institutions.

As stated in previous sections, ministries of education tend to be better organized and have more generous budgets when they serve levels and modes of education that are largely reserved for the rich. This may be regrettable, but it is neither new nor surprising. Moreover, even within higher education—which often gets the lion’s share of educational budgets—there is a pecking order that reproduces the same bias. Since two- and three-year careers cater to students of lower economic status, they tend not to be treated equally. Institutions that offer short careers tend not to be given the highest priority in post-secondary education. Administrators sometimes feel that they can achieve considerable savings by cutting costs in the operation of short-career programs.

This is especially true in Chile, whose technological education centers are restricted to the shortest careers and whose least socially privileged students are deprived of financial aid programs. Although tuition and fees have been paid by Chilean students for a long time, both at public and private universities, Chile has a multi-tier system in which some categories of institutions are clearly privileged by public policy. While the Chilean system is more progressive than most Latin American countries, where diversification is not acceptable at the policy level, it is probably too generous to the top tier and unfair to the lowest.

The Chilean system of universities is divided into three tiers: (1) public autonomous universities, (2) nonpublic autonomous universities (generally Catholic), and (3) private for-profit universities that can obtain autonomy from the *Consejo Superior de Educación*. The most important difference is that the first and second tiers—i.e., the traditional universities—receive governmental grants and their students have access to a reimbursable scholarship program. Short-career programs are not considered part of the system. This, in itself, is blatant discrimination.

Consequently, these mechanisms leave out financial help for students from private universities, technical training centers (*centros de formación técnica* [CFT]), and professional institutes (*institutos profesionales* [IP]). As a result, there is no financial aid for those who study short careers, unless they study in universities that have access to the state’s financial aid system. In other words, close to

85 percent of the students of short careers do not have access to state financial aid. The students of the CFTs have access to only the scholarships that are offered by the institutions and the special government scholarship program. The first reached 4,000 students in 1996, the second 1,600; together they covered around 9 percent of the student population (Departamento de Centros de Formación Técnica, 1999).

The absence of financial support for CFT students is not consistent with their socioeconomic status, since CFT students are the poorest among those who pursue higher education in Chile. And between 1996 and 1998 they became even poorer (Table 2.15).

Unlike public universities, the CFTs do not receive subsidies and do not qualify for tax-deductible gifts. (This is due to regulations that consider the CFTs as private, for-profit entities, which is not consistent with their true character.) The CFTs are financed exclusively from tuition paid by students, plus utilities obtained from labor training activities.

For this reason, the careers that have the largest enrollments in the CFTs remain management and commerce (representing 43 percent of total enrollment for 1999), which do not require expensive equipment. These are followed by general technologies (including computer science), which represent 30 percent of total enrollment. In contrast, in technical careers in universities, most students are in technology (62 percent of total enrollment), followed by management and commerce (17 percent).

The competitiveness of the CFTs in a system of higher education that places them at the bottom of the institutional hierarchy depends to a large extent on keeping their tuitions lower than those of the IPs and universities. Consequently, the CFTs typically charge tuition that represents 30 to 50 percent of the tuitions charged by universities, which limits the capacity of the CFTs to finance fund-generating investments. On average, 82 percent of CFT income is destined to cover operation expenses; 11 percent is used for other purposes; and only 7 percent is geared toward real investment (Departamento de Centros de Formación Técnica, 1999).

The difficulties that the CFTs are experiencing are not only caused by competition with the universities and IPs. The low quality of the educational services that most of them provide is also a factor. For example, approximately 70 percent of the CFTs do not have their own infrastructure. Most must conduct

**Table 2.15. CFT Enrollment by Quintile of Income, 1996 and 1998**  
(In percent)

Quintile	I (lowest)	II	III	IV	V
1996	7.4	13.1	19.0	28	32.5
1998	10.6	18.8	20.8	25	24.9

*Source:* Departamento de Centros de Formación Técnica (1999, p. 31).

training activities in rented buildings that were designed to be dwellings; many of the buildings are badly deteriorated. A similar situation affects support facilities such as libraries, labs, workshops and recreational areas.

Most CFT teachers are hired on a per-class-hour basis. The only teachers who work half or full days are those in administrative positions.

Ultimately, the small size of many CFTs is a serious weakness. Fifty-seven percent of the CFTs have enrollments of fewer than 250 students; only 16.2 percent have enrollments of more than 500 students. These sizes are impediments to attaining the economies of scale necessary for development.

With few exceptions, the CFTs have not developed mechanisms for involvement with the industrial sector. Moreover, there is no national system for providing information about the demand for skilled technicians. As a result, the CFTs are oriented toward the demands of students rather than the demands of potential employers.

The participation of higher education institutions in workforce training through specialized courses and occupational retraining (which usually last a few weeks or months) is still minimal. Of the 44.779 million pesos invested in training under tax exemption in 1998, the universities expended 3.958 million (8.8 percent), the IPs 494 million (1.1 percent), and the CFTs 517 million (1.2 percent), for a combined total of 4.969 million, or 11 percent of the total investment in training through tax exemption. In other words, the universities trained 5.8 percent of the workforce trained under tax exemption in 1998, the IPs trained 0.79 percent, and the CFTs trained 0.78 percent, for a total of 7.3 percent for higher education as a whole.<sup>14</sup> From these numbers it can be deduced that the training performed by

<sup>14</sup> According to Statistical Studies Department of the National Training and Employment Service of Chile's Ministry of Labor.

institutions of higher education is barely significant relative to the total, concentrated in the universities, and on average more expensive than training offered through tax exemption.

To sum up, it is not hard to explain the decline in CFT enrollment in comparison to OECD and other Latin American countries. The hierarchical system in Chile concentrates public resources in traditional and state universities, where economic necessity and usefulness to the student are taken into account. Intellectual performance is not separated from socioeconomic status. However, the lowest level of the system, which brings together less privileged students and students representing the lower rungs of society, is the one that lacks aid.

Recent measures have the potential to change this situation, at least in part. In the context of MECESUP (*Programa MECE Educación Superior*), an educational improvement program directed by the Ministry of Education and the World Bank, a \$7 million fund has been established for strengthening short careers. The fund is accessible to universities, professional institutes, and centers for technical training that fulfill certain requisites of institutional consolidation. Half of the 63 IPs and 30 percent of the CFTs qualify to apply for funds. The Chilean government has also announced the routing of \$3 million in 2001 for scholarships for students in technical fields enrolled in institutions that meet requirements for eligibility.

These measures have been interpreted as signs of a new attitude toward short careers on the part of the government that would put an end to the relatively low status that has characterized technical education for the last two decades.

The CFT Lota-Arauco of the Universidad de Concepción, which was created with substantial state support a few years ago in the economically deprived southern region of Chile, has shown that it is possible for poor students to obtain a high-quality technical education in Chile, but that making this opportunity available requires high levels of support from the state, expressed through scholarships and in provisions for the development of infrastructure and laboratories.

Larger CFTs (e.g., INACAP), which maintain close relations with industry, have successfully practiced the strategy of dividing technical programs into short modules (lasting a few months) organized around families of occupations of increasing complexity. In addition to giving students the flexibility to alternate periods of study and work, this strategy allows students to benefit from the tributary discount that the state offers to the businesses that cover the training expenses. The advantage of modularization is that the tributary incentive is

directed only toward training courses lasting, at most, a few months, and cannot be applied to the funding of careers leading to technical or professional degrees. For those who want to complete two-year career programs, the modularization is, to a certain extent, artificial, but it contributes to business participation in the financing of technician training.

To sum up, Chile presents a picture of both modernization and discrimination. It has seriously invested in defining a clear segmentation of higher education institutions. It has challenged the regrettable Latin American tradition of pretending to offer equal education to those who are different and ending up offering the worst of both worlds: good education for the rich and the mimicry of the same institutions for the remainder of society. Instead, it has carefully segmented institutions of higher learning and developed imaginative and merit-based funding mechanisms. By any standards, it is the most advanced and sophisticated structure of higher education. But unfortunately, it has short-changed the short cycle institutions. They are not properly represented at education policy forums (such as Rectors' Council). They do not receive public subsidies. Lastly, the small and impecunious private institutions that mostly offer this level of education are completely left on their own.

## ***Brazil***

Brazil has had two separate technical-vocational training systems. One is the "S" system, founded in the 1940s in the early stages of import-substitution industrialization. Funded by a payroll tax of around 1 percent, the S system falls under the responsibility of the Ministry of Labor and Employment, even though the schools are private and owned by the federation of industries of the corresponding state. The other system, which is older but was less influential in earlier times, belongs to the Ministry of Education. The first schools, which were initially a sort of government charity for job training for poor young people, were created in the early 20th century. When vocational and technical education came to the forefront after World War II, much greater emphasis was given to these institutions, and multilateral bank loans funded their new and expensive campuses. From a small set of schools, the system progressively became a national network of high-quality technical schools.

In addition to these two systems, international agencies persuaded the

country to create comprehensive high schools, which integrate general education with vocational studies, as done in the United States. However, the coexistence of academic and vocational education in the same schools was problematic. The social prestige of the former acted like light on butterflies; only a tiny proportion of the pupils who enrolled in comprehensive programs really intended to pursue the corresponding careers (Castro et al., 1972).

Something similar happened at the secondary-level technical schools. Most of the schools are part of the federal network of technical schools, but the *Serviço Nacional Aprendizagem Industrial* (SENAI) also operates around two dozen technical schools, in addition to its some 700 vocational schools. These few SENAI technical schools offered high-quality academic education, in addition to technical training—and in both cases they were always tuition-free. As a result, admissions became so competitive that most of the students who were able to pass the entrance examinations were upper middle class. But those students were more interested in preparing for competitive entrance examinations to prestigious universities than in high-cost technical education for mid-level occupations. Thus, in most cases, the schools became an expensive means of preparing the rich for the best universities, at the taxpayers' expense. This inefficient and inequitable system lasted for over 30 years.

The vocational schools of SENAI and SENAC (the counterpart of SENAI sponsored by commerce and service companies) fulfill their mission and serve students who want to learn the trades taught. However, the technical schools from both systems were also co-opted by elites, because the academic education that goes hand-in-hand with technical training is of very high quality. For this reason, the technical system lost part of its functionality. It enrolled rich students who were indifferent about the trades taught and excluded the more modest students who could not compete for admission. However, while the S system did not escape this fate, its technical schools were better tuned to high-demand technical occupations. Therefore, the proportion of students transitioning from technical courses to unrelated higher education programs has been lower than in the Ministry of Education technical schools.

The Brazilian case goes counter to the Latin American tradition in technical education. Most Latin American countries have large systems in which technical education is less expensive and carries a lower status, thereby attracting lower-class students and repulsing elites. In its attempts to promote industrialization,

however, Brazil ended up with two very expensive systems: the Ministry of Education technical schools and the SENAI system of vocational training, which includes around two dozen technical schools. Again in contrast to the rest of Latin America, these are very small systems, considering the size of the country.

The new general law on education made it easier to eliminate this persistent distortion. As previously mentioned, the Ministry of Education split the general education track (first and second levels of education) from the vocational/technical track. Consequently, the latter are now offered as separate programs. The technical schools may still maintain some academic tracks, since the political pressures from clients were initially strong. But students in the academic track do not have to take technical courses and do not earn technical degrees. By contrast, students who are interested in the technical tracks may already have secondary degrees or may finish them simultaneously. But those students, who usually represent more modest socioeconomic backgrounds, are interested in the trades taught—otherwise, why would they study them, if doing so does not lead to academic diplomas? In practice, the courses end up being post-secondary, because most technical schools no longer offer academic high school programs.

Brazilian technical schools were traditionally very elitist because of the high-quality programs they offered. Some have already moved up to post-secondary technological courses or regular engineering courses, master's programs, and even doctorates. In these schools, industrial research is quite common (see Appendix 4).

The Ministry of Education schools gained some autonomy and became federal centers for technological education, better known by the acronym CEFET (*Centro Federal de Educação Tecnológica*). The most outstanding of them is located in the state of Paraná, an industrialized region in southern Brazil. As a result of its efficiency and accomplishments in education, research and development, it is considered a model institution in technological areas. Although CEFET-Paraná is one of several institutions receiving funds from the \$1 billion Professional Education Expansion Program, cosponsored by the Inter-American Development Bank. Nevertheless, an IDB evaluation revealed that this institution is not immune to academic drift. It had to restructure its technical education course by order of new regulations that split the secondary degree subjects from the technical or occupational tracks. But instead of creating a stand-alone program leading to high demand occupations, as is the spirit of the reform, it created a post-secondary program devoid of job-oriented content or any close connection to the



labor market. As a consequence, the course became a preparatory program for the longer and very elitist technological level. Whether this was done consciously or not, in practice, the technical education students were not really prepared for the labor market and had no better option than to transfer to the elitist technology program.

Before the new legislation, the technical education course had a highly selective admission exam; only 7 to 10 percent of the candidates were approved. Of course, members of local wealthy families were admitted, whereas students of lower socioeconomic status had to look for other opportunities. The elite students, in accordance with their families' expectations, continued their studies at the university level. After the reform, it was obvious that a much less privileged group would be admitted; since losing the academic high school degree, the technical program would become a lot less attractive to the elites.

By offering a two-year technical program that is not market driven but rather generic and heavy on theory, the school acted as if it did not want to deal with less academically capable students—who also happened to be more modest socially. As a result, lower-class young people interested in entering the labor market as soon as possible had to face the cost of studying for two additional years. In other words, CEFET-Paraná, in effect, replaced its elitist technical course with another that allows it to remain elitist.

Since CEFET-Paraná has national influence, its bad example may be followed by others. This practice contradicts one of the major goals of the new policies to improve equity, and runs counter to the goals of giving more modest students a program better suited to their situation, as is done in the United States and Canada, where the community college serves as a vehicle of social mobility.

While the Ministry of Education has put pressure on CEFET-Paraná to change this policy, this example shows how schools are reluctant to lower the socioeconomic levels of their clientele and are determined to find ways to protect their recruitment policies from academically less capable students.

## *Conclusions*

Sociological studies have shown that curricula are selections of knowledge that confer varying degrees of prestige and are allocated to diverse social groups in different amounts. In the stratification of curricula, the more abstract the knowl-



edge transmitted, the higher its status. The closer the knowledge is to practical applications, the lower its status (see Bernstein, 1977, 1990). This is the background of the traditional differentiation between academic and vocational education in the Western world. Nevertheless, public policymakers should go beyond mere recognition of such stratification. Their role is to determine how best to manage curricular distribution of knowledge to maximize the opportunities of social groups that fail in the most demanding school trajectories, whether as a result of sophisticated abstraction or as a result of an inability to pay for additional schooling, or both.

In this sense, the evidence pertaining to Venezuela indicates that diversification of higher education there makes a significant difference. Socioeconomically diverse citizens who are nonetheless equal with respect to rights may reach their goals by means of different paths. In contrast, formally equal paths may appear to offer equality of opportunity while in reality imposing an unfair burden on the underprivileged.

Despite such effects on democratization, the pecking order within education ministries reveals that short careers are being shortchanged. Traditional universities still occupy the highest echelons of prestige, followed by non-university institutions. Similar situations are found in Venezuela, Argentina and elsewhere. In Brazil, a model institution has gone counter to the spirit of the reform in order to maintain elitist recruitment instead of opening its doors to the young people from lower socioeconomic backgrounds and less demanding public schools.

To sum up, one of the major hurdles to short-cycle education in Latin America is the government policies and the institutions themselves. Elitism, so pervasive in other dimensions of Latin societies, reappears just as strongly within higher education. Whenever ministries of education create tracks where the less affluent are more likely to be, these tracks are on the losing end of power and budgets inside the ministry, under-funded and under-represented. They are the lowest in the pecking order inside higher education departments. The same discrimination is equally ingrained inside technical institutions themselves. The better technical schools may perform a valuable job of training high-level personnel for sophisticated enterprises. Yet, they can be as elitist as the power elites and may discriminate against the less affluent just as much. In so many ways, those who rank lower in society attend institutions that also rank lower and offer substandard education.

The better-off institutions opt for better students rather than for greater equity. The contrast with American community colleges could not be greater than in this lack of commitment to more modest clienteles. Granted, community colleges are not the highest prestige institutions in the United States. However, they are well endowed with means, staff, funds and well-focused programs for their modest clienteles. Perhaps one of the most powerful lessons that community colleges could teach Latin Americans is their devotion to the most noble task of educating those who are at the lower end of the academic aptitude scale.

## The Elusive Transfer Function

In a perfect world, mobility and equity in higher education would be ensured by easy transfer of credits between institutions. A short career would be a step toward the top levels of employment, and technicians would not have to face obstacles like the aforementioned credentialism in Venezuela (and, of course, elsewhere). Junior colleges in the United States, which were tailored to the needs of World War II veterans, concentrated largely on general education, as if it were the first half of a traditional college program. Today's community colleges strive to offer a blend of general and occupational education and, in so doing, give their students the broadest possible range of educational and career options. One important component of this effort consists of developing programs and formulating articulation agreements that allow students to transfer to four-year institutions. Articulation serves an essential role in fulfilling the community college mission.

In contrast, the evolution of higher education in Latin America has not been conducive to the development of articulation. In earlier times, higher education often was intended to graduate the professionals necessary to run public bureaucracies in agrarian societies. In Brazil, higher education came into being after the end of colonization, when French revolutionary ideas inspired isolated professional schools in medicine, law, engineering and other fields. As a result, each undergraduate course was professionally oriented from its inception, highly differentiated, and subject to independent admission of a limited number of students (*numerus clausus*). In spite of several attempts to establish a common core of knowledge at the university level, Latin America in general, and Brazil in particular, retains the shadow of this utilitarian approach.

Curricular comparison with the United States shows the difficulty of transfer in the highly structured professional schools of Latin America. The case of *Engenharia Operacional* in Brazil is particularly illustrative. However, the same does not happen when the institutions that offer short and long careers have the same owners, as in Mexico and Colombia. In the latter cases, the objective may be to increase internal mobility, which helps schools retain and enlarge their clienteles.

### *Is Transfer to Four-year Colleges Possible in Latin America?*

American proponents of community colleges place great emphasis on the opportunity to transfer to four-year colleges. In fact, equality of opportunity is a primary selling point of community colleges, and the possibility of transferring to four-year colleges is a strong component of their role in boosting social mobility. The argument is backed up by performance: American and Canadian institutions have a respectable rate of transfer of students who graduate from associate degree programs.

However, even in schools in the northern hemisphere, transfer options are limited to students enrolled in so-called university-parallel programs. And, increasingly, while enrollment in those programs is large, it constitutes only a relatively small percentage of total enrollment in U.S. and Canadian community colleges. Career education programs and the thousands of programs geared to specific business and industries or to more mature students do not usually offer this possibility.

In addition, even in university-parallel programs, transfer depends on the approval of the receiving institutions—the four-year colleges and universities. The latter accept students on a case-by-case basis or according to formal agreements with the community colleges. It took much longer for Canada to make arrangements of this type, since four-year programs in Canada are more professionally oriented, as in Europe and Latin America. Therefore, when we consider the possibility of having students transfer to four-year programs in Latin America, we must begin with the caveat that even in the United States and Canada these transfers are less than universal and automatic.

Latin America presents a very different picture with respect to transfers. This becomes clear when we compare curricula pertaining to the same careers. The focus here is on accounting, which attracts large numbers of students in both

regions and can be pursued in the United States via both two- and four-year programs. (An analysis of curricula for other careers, e.g., engineering, would lead to similar conclusions.)

There are three general types of courses: (1) *Electives*, i.e., courses that are taken by choice, are not directly related to occupations, and typically include courses in the humanities, languages or other general areas; (2) *Prerequisites*, i.e., courses that are required prior to studying an occupation or group of occupations, including quantitative methods, mathematics, statistics, or basic sciences; and (3) *Occupation-related courses*, i.e., courses that teach the core and specialized skills that correspond to the occupation that is being learned.

Assignment of courses to these categories is arbitrary in some cases, but gray areas do not invalidate the main conclusions that can be derived from the analysis.

The following tables show comparisons between programs in the United States (Tables 2.16 to 2.18) and Latin America (Table 2.19), the latter represented here by Brazil .

In Brazil as in much of Latin America, the study of accounting at the post-secondary level offers no curriculum flexibility and leaves no room for electives. The implications are clear: to reach the third year of college, students must take all the prerequisite courses and all the occupation-related courses. Four-year programs in Latin America do not recognize credits awarded for any course that is not mandated for the initial two years. There is only one path to the third year. The Venezuelan case, studied below, also shows the difficulties in building bridges between short and long careers. As in Brazil, educational and labor

**Table 2.16. Accounting in the United States**

Associate degree	<p>Half of the credit hours are in required courses, which include a strong component of general studies (English, mathematics, etc.).</p> <p>Half of the credit hours are related to accounting.</p>
Four-year program	<p>One-fourth of the credit hours are electives and general education courses.</p> <p>One-fourth of the credit hours are prerequisites.</p> <p>One-half of the credit hours are related to accounting.</p>

**Table 2.17. Bachelor of Science in Accounting (U.S.)**

Year 1	Year 2	Year 3	Year 4
<b>First semester</b> <ul style="list-style-type: none"> <li>• Math</li> <li>◊ Liberal arts elective</li> <li>◊ Liberal arts elective</li> <li>◊ Physical education</li> </ul>	<b>First semester</b> <ul style="list-style-type: none"> <li>• Microeconomics</li> <li>• Legal environment</li> <li>◊ Liberal arts elective</li> <li>◊ Liberal arts elective</li> </ul>	<b>First semester</b> <ul style="list-style-type: none"> <li>– Intermediate accounting</li> <li>– Financial management</li> <li>– Cost accounting</li> <li>– Introduction to marketing</li> </ul>	<b>First semester</b> <ul style="list-style-type: none"> <li>– Advanced accounting</li> <li>– Federal legislation</li> <li>◊ Liberal arts elective</li> <li>– Finance elective</li> </ul>
<b>Second semester</b> <ul style="list-style-type: none"> <li>• Statistics</li> <li>• Literature</li> <li>◊ Lab sciences</li> <li>◊ Liberal arts elective</li> </ul>	<b>Second semester</b> <ul style="list-style-type: none"> <li>• Legal environment</li> <li>• Macroeconomics</li> <li>◊ Liberal arts elective</li> <li>– Financial accounting</li> </ul>	<b>Second semester</b> <ul style="list-style-type: none"> <li>– Operations management</li> <li>– Information systems</li> <li>– Intermediate accounting</li> <li>– Organizational behavior</li> </ul>	<b>Second semester</b> <ul style="list-style-type: none"> <li>– Auditing</li> <li>– Strategic global management</li> <li>◊ Liberal arts elective</li> <li>◊ Liberal arts elective</li> </ul>
• Required for professionalization – Major related ◊ Elective not related to major			

**Table 2.18. Professional Accountant Associate Degree (U.S.)**

Year 1	Year 2
<b>First semester</b> <ul style="list-style-type: none"> <li>• English composition</li> <li>• Oral presentation</li> <li>• Microeconomics</li> <li>• Computers</li> </ul>	<b>First semester</b> <ul style="list-style-type: none"> <li>– Financial accounting</li> <li>– Cost accounting</li> <li>– Accounting information systems</li> <li>• Business statistics</li> <li>– Major elective</li> </ul>
<b>Second semester</b> <ul style="list-style-type: none"> <li>• Liberal arts elective</li> <li>• Business math</li> <li>– Managerial accounting</li> <li>– Income tax</li> </ul>	<b>Second semester</b> <ul style="list-style-type: none"> <li>– Comptrolling</li> <li>– Advanced accounting</li> <li>• Business law</li> <li>– Accounting internship</li> </ul>
• Required for professionalization – Major related ◊ Elective not related to major	

**Table 2.19 Four-year Accounting Program in Brazil**

No electives One-third prerequisites Two-thirds related to accounting			
Year 1	Year 2	Year 3	Year 4
<b>First semester</b> – Accounting I • Information for accounting • Mathematics • Macroeconomics – Management	<b>First semester</b> – Intermediate accounting • Sociology • Statistics I ◇ Brazilian economy – Public and private law	<b>First semester</b> – Cost accounting – Accounting theory – Financial institutions – Major elective – Business law	<b>First semester</b> – Comptrolling – Consolidated statements – Major elective – Financial management
<b>Second semester</b> – Accounting II – Business accounting • Math II • Macroeconomics – Commercial techniques	<b>Second semester</b> – Advanced accounting • Quantitative methods • Statistics II – Major elective – Labor law	<b>Second semester</b> – Economic and financial analysis – Constant prices accounting – Major elective – Intermediate accounting – Organizational behavior	<b>Second semester</b> – Major elective – Major elective – Major elective – Accounting seminar
• Required for professionalization – Major related ◇ Elective not related to major			

market regulations interact to make the transfers difficult. The same applies to Chile, as mentioned earlier.

What this means is that the only community college program that would allow a student to transfer to the third year of accounting is one that offers exactly the same courses as the two initial years of the four-year program. A two-year course would have to be an exact copy of the two initial years of the four-year program.

One can create such a clone. However, the resulting program would not prepare students to enter an occupation, because the first two years of a four-year program consist entirely of theory and prerequisites.

By contrast, in the United States three factors allow for the transfer. The first is the inclusion of electives and humanities, which create a buffer zone, allowing the associate degree graduate to use as credits some of the courses taken, whatever they might be. The second is the built-in flexibility that results from the greater variety of paths that lead to the third year. The third is the much smaller proportion of prerequisites, which is part of the built-in flexibility.

Therefore, two-year courses in Latin America have three options. First, they can clone the first two years of a four-year program. This is tantamount to creating a four-year program that is taken at two institutions. The graduates are strongly discouraged from stopping at the end of the second year because they are unprepared for the job market. Programs that tried the cloning approach failed in the long run. A good example is the “operations engineer” program offered in Brazil in the 1970s. All of the graduates of the program wanted to continue to full engineering degrees because they had not been prepared for the labor market.

Second, two-year courses in Latin America can drop the idea of transfer. It is the contention of many thoughtful analysts that, in general, this is a much better idea. Those who choose a shorter course do so because a four-year program is too expensive, too long, or too difficult. For them, a two-year course that does not prepare graduates for jobs is just a bad joke. And, considering that occupations available to well-prepared graduates of some two-year courses can be very rewarding, it makes sense to offer terminal programs of this nature.

The third alternative is to change the four-year programs so that they become flexible enough to allow transfers. This alternative may be promising in the long run. But in the short run, one must understand that power and status are much greater in the institutions and stakeholders associated with four-year programs. The tail does not wag the dog. Lower-prestige institutions offering shorter courses do not have the political clout to impose reforms on higher-prestige institutions.

The only practical way out seems to be private institutions that operate both two- and four-year programs. These institutes have an incentive to create flexibility and facilitate transfer because they benefit from transfer. There are two known cases. One is *Unico*, a branch of the aggressive *Universidad Autonoma de Guadalajara*

in Mexico. The other is in Colombia. Both are private and have managed to tailor their curricula to allow transfers.

In summary, Latin Americans are well advised to be very cautious about trying to adopt transfer. Though it is a highly desirable feature of U.S. and Canadian community colleges, it is clearly an innovation that is, at present, blocked by differences in traditions and structures of higher education in Latin America. This is a loss to be regretted. But except in private institutions offering both types of courses, it is beyond the power of those in charge of two-year programs to force changes on the other colleges.

### *The Precarious Bridges Between Short and Long Careers in Venezuela*<sup>15</sup>

Many young Venezuelans enter short careers because they have limited resources and inferior academic indices. However, short careers show greater economic efficiency than long university careers. Associate degree technicians earn less and are more likely to experience periods of unemployment than college graduates, but associate degree technicians earn more and have a greater rate of participation in the formal sector than high school graduates. Also, when associate degree technicians gain work experience, their likelihood of unemployment decreases. Therefore, short careers offer significant benefits to young people of humble origin. The next round in the fight for their mobility and ascension in careers and in the educational system will revolve around inequities in access.

#### *Inequities in Access: Credentialism or Human Capital?*

In Venezuela, associate degree technicians are denied access within the institutions for which they work to positions reserved for graduates of long careers. This pattern is commonly observed in public businesses, public administration and large businesses, where profiles for positions are formally predetermined in career manuals. There the advancement paths for associate degree technicians and engineers with bachelor's degrees run parallel to one another. There is no mechanism that enables horizontal mobility between them, and the best salaries

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<sup>15</sup> Taken from Bruni Celli (2000).



that associate degree technicians can aspire to are always lower than those of engineers with bachelor's degrees. Many positions are reserved for the latter: associate degree technicians cannot choose management positions, and even in IUs, IUTs and CUs, associate degree technicians cannot fill the position of professor.

The evidence points to a discriminatory system in which employing institutions predetermine the growth paths of associate degree technicians and engineers with bachelor's degrees solely on the basis of their credentials, without regard for the true productivity potential of the associate degree technician (Castillo Rojas, 1994). Many factors could explain this situation. First, in traditional professions the status quo is often protected by powerful unions. An interview of a group of associate degree technicians in a state business revealed battles between university graduates and associate degree technicians. Arguing that there is no compelling reason to reserve certain positions for graduates, the associate degree technicians exerted pressure to obtain access to those positions. After harsh conflicts, the associate degree technicians achieved certain victories, although from their point of view they continue to be unjustly discriminated against. Second, the fact that this rigid, credential-driven system of parallel careers prevails in the public sector suggests that it was installed for the purpose of protecting public service from "unqualified" people (as determined by political rather than technical considerations). Given the influence of the public sector in the labor market, the system has spread to the private sector.

The Venezuelan system is discriminatory in that associate degree technicians' opportunities for growth are limited by their credentials and do not take into consideration their potential productivity. In contrast, the fact that German industrial technicians with excellent performance records can attain high-level positions in business suggests that the credentialism of the Venezuelan system is classist. It is possible, however, that the ceiling imposed on associate degree technicians is not totally a product of a classist dynamic but rather reflects the smaller investment by those technicians in "human capital." Businesses that take into consideration the relative size of the educational investment may see associate degree technicians as having more limited productivity potential, since they have devoted less time to their academic development. Available data on the inferior opportunities of associate degree technicians in the labor market do not take into account the relative weights of discrimination and human capital.

Whatever the case may be, the truth is that, to grow in the occupational world, associate degree technicians must continue their education. Hence, the critical question is what opportunities do graduates of short careers have to obtain university degrees and pursue postgraduate study if they want it?

### *The Problem of the Academic Ceiling*

There are two dimensions to the problem of academic ceilings faced by graduates of short careers: university acceptance of “equivalencies,” and student access to the four-year degree system.

*Equivalencies.* In discussions regarding the 1970 University Act, Venezuelan policymakers considered horizontal movement from short careers to long careers, that is, the possibility that short-career graduates who want to continue with a college education could do it through a system of equivalencies. In fact, the initial objectives of the CUs included providing disadvantaged students with preparation that would eventually give them access to a college education. However, neither the University Act nor the procedures for university institutes established in 1971 established any norms about transfer from short careers to the rest of the higher education system. Because there was no system of assessment of credits for the automatic continuation in other university careers of long duration, the universities had total discretion in recognizing the credits of short-career graduates (CERPE, 1979).

In general, universities have looked upon short careers as terminal routes. Today, in most universities, graduates of short careers who want to continue their studies face the obstacle of having to enroll in five years of education again, repeating a substantial portion of subjects already taken. A few universities, almost all third-rate, accept some credits obtained in short careers, mainly in programs unrelated to the original training of the associate degree technician. And since only a few universities provide this opportunity, technicians who want to continue their studies must often wait many years for an opening. In conclusion, graduates of short careers who want to continue advancing socially and professionally by continuing their studies at a university face many obstacles.

*Access to the four-year degree system.* Interestingly, until 1983, graduates of two-year programs had a peculiar rising trajectory in that universities admitted them into their postgraduate courses. Thus, they were able to get specialties,

master's degrees, and doctorates after completing short careers. But a CNU regulation of 1983 eliminated that possibility (Castillo Rojas, 1994). The regulation established that only those who completed careers of at least four years (undergraduate) could opt for the postgraduate system. As a reaction to this measure, pedagogical and polytechnic institutes nationwide expanded their programs from four to five years and became "universities." Many private IUs and IUTs did the same. But since that time, a huge number of disadvantaged youngsters, usually those sent to public IUs, IUTs and CUs by the national allocation system, have found out that those doors to professional improvement and social advancement were closed.

In summary, in the same way that the traditional technical schools were closed down 25 years ago, the higher-level two-year degrees suffer from a discriminatory bias that became the justification for closure of ETIs. They do not automatically provide advancement opportunities for the technician in the world of work through academic study (Castillo Rojas, 1994).

The causes of the academic ceiling problem are political and institutional. The University Act of 1970 established governing bodies that are different for universities and for university institutes and schools. For universities, the governing body is the National Council of Universities (CNU), while for university institutes and schools it is the Ministry of Education. This means that the IUs, IUTs and CUs have no representation within the CNU. Nevertheless, the CNU can pass regulations that affect them, because of the Education Act of 1980. The IUs, IUTs and CUs, as well as the universities, are institutes of higher education (article 28), and the CNU can issue regulations that are "mandatory on the part of all higher education institutes" (article 30). It turns out to be a dual system in which power is biased in favor of the CNU; that is, although the ruling organisms are different for universities and for the IUs, IUTs and CUs, the CNU, within which the latter do not have representation, can issue regulations that affect the entire higher education system.

So, it can be concluded that within the Venezuelan labor market there is rigid credentialism that eliminates the possibility of reaching certain positions in big corporations, even for the most talented two-year technicians. The fact that these technicians, whose education is only two years shorter than that of long career graduates, have lower social status in economic organizations causes considerable tension. This tension can become worse because the socio-

economic origin of two-year technicians is generally lower than that of university graduates.

Given these conditions, there is tremendous pressure on two-year technicians to take the two remaining years of study. However, the higher education system still does not offer enough alternatives that recognize the credits obtained by these technicians during their first careers.

### *Brazil: The Frustrated Attempts of Engenharia Operacional in the 1960s*

Engineering schools in Brazil were largely inspired by the French *polytechniques*, which offered mostly a solid theoretical background rather than practical or hands-on activities. The advancement of import-substitution industrialization, and particularly the establishment of automobile manufacturing, placed new demands on higher education in the early 1970s. The market looked for an engineering graduate with a practical background who could serve as a link between the professionals who conceptualized products and the blue-collar workers who produced them.

The Ministry of Education, sensitive to these new demands, planned a highly standardized curriculum based on the needs of mechanical engineering. The course, called *engenharia operacional* (“operational engineering”), lasted three years and was very often offered alongside the traditional five-year program.

In spite of concrete demands from the labor market, students and recent graduates faced several obstacles:

- Curriculum centralization did not satisfactorily respond to market demands. In particular, the programs authorized in the areas of building, electricity and chemistry were inadequate to prepare students for mechanical engineering. The curriculum designers attempted to find a workable compromise between practical skills (as determined by business) and the theoretical background (and inherent social prestige) of five-year engineering programs, which were rooted in the 19<sup>th</sup> century. According to one specialist, the program was not a short career but an abbreviated long career. As a result, it was neither fish nor fowl. However, the transfer function was very successful, because it was the only intelligent decision for a graduate.

- Operational engineering background overlapped with that of technologists, that is, the curriculum was excessively oriented to practice at the expense of theory.
- Some higher education institutions were more interested in the academic background and strict conformity to national rules, thus short-changing the needs of employers. Sometimes graduates found out they were not in demand in the labor market.

The innovation also produced a problem of professional identity. The corporatist organization of labor in Brazil, largely inspired by Italian and German laws dating from the 1930s, rejected the new graduates. The traditional engineering board refused to give them a license until new legislation compelled them to do so. Discrimination prevailed in the labor market, sometimes on the grounds that operational engineers were so successful that they threatened their “senior” colleagues. A common argument was that employers do not know the difference and may be cheated into hiring a lower level professional. Facing the rejection and the diffuse profile of the new professional, the Ministry of Education decided to discontinue the program in 1977, 14 years after its creation. The remaining “operational engineers” completed the coursework and became classic engineers in their areas of specialization.

At least two lessons are to be learned from this experience. First, bridges between education and business must be continuously built, not burned. Second, if curriculum is ambiguous, does not prepare students for jobs, and favors transfer in a highly competitive (or even conflictive) environment, students tend to opt for long careers, refusing short courses that may offer transfers, in favor of prestige and long-term income potential.

### *Transferring within Schools with the Same Owner*

Transfer involves several challenges. One involves the logistics of transferring students from short to long careers when the same institution offers both programs. An example is UNICO (*Universidad de la Comunidad*), a unit of the Autonomous University of Guadalajara, Mexico, created in 1991 and inspired by the American community college model. Confirming the importance of independence (as in the United States and Canada) and avoiding the risks of academic

drift (which has adversely affected some schools in Chile), UNICO enjoys a level of autonomy that enables it to establish a truly flexible model. It offers eight-quarter careers finely tuned to the labor market. Curriculum is centered on competencies and combines basic and occupational subjects. Students can work and study at the same time, taking advantage of the school's dual learning system (university + company).

The school's faculty members come from the business sector, though they require additional training to teach. Depending on curricular composition, especially the number of basic subjects, transfers from short to long careers are easier in some cases than in others. The question is the correlation possibilities between two- and four-year programs. In any case, a fundamental principle is that any time the student leaves a course of study, he or she must have marketable skills.

In Chile, as elsewhere, transfers are easier when the institutions have the same proprietors.<sup>16</sup> In the cases where one entity controls an IP and a CFT, there are generally systems for continuing studies from the technical to the professional level. These systems allow technical graduates, after the courses taken have been approved and the graduates have taken a one- or two-semester program for filling in knowledge in basic sciences, to add two years of college for the purpose of obtaining a professional degree.

However, the transfer process most widely used is the intermediate exit, which is done primarily by IPs and, to a lesser extent, by universities. When they are well designed, intermediate exits are not automatic. They require evaluation of courses and stipulate that the student take one or two semesters of applied courses and occupational training after completing the first two years of the long career.

With respect to coordination between secondary education and post-secondary technical training, there is growing interest on the part of the CFTs and IPs in creating (1) systems for continuing education (from secondary school to the professional degree) through coordination of the programs of study for technical-professional training and post-secondary careers, and (2) systems of course evaluations and exams that allow students to progress from one level to the next without having to start from zero every time.<sup>17</sup>

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<sup>16</sup> See Bernasconi (2000 ).

<sup>17</sup> In the case of DUOC, the approval of technical studies performed at the high school level is done through the administration of an exam to applicants to the post-secondary technical level.

Consider the example of INACAP, which belongs to the *Confederación de la Producción y el Comercio* (the most important association of industries and businesses). INACAP is committed to a transfer process involving its own study programs and those of high schools that belong to the educational corporations of the *Sociedad Nacional de Agricultura* and the *Cámara Chilena de la Construcción*. Also, INACAP is developing mechanisms that would provide for evaluation not only of courses taken but of relevant work experience.

The next step in the process of transferring would be to authorize the best establishments of secondary technical education to offer short careers at the post-secondary level and allow the best CFTs and IPs to offer secondary technical education. Another suggestion has been to form networks of universities, IPs, CFTs and technical high schools for collaboration in curriculum development, research and facilitation of vertical mobility between the member institutions.

In institutions of higher education that are financed exclusively through student tuition (as is the case with the IPs and CFTs of Chile), course offerings tend naturally to be aligned more with the demands of potential students than with the demands of potential employers. Although the insensitivity of short careers to the necessities of the working world continues to be a problem, many institutions have established councils of business analysts and other mechanisms for providing ongoing feedback and assessment. In several career areas, DUOC is experimenting on its own with the “dual” model of alternating between practice in the workplace and theory in the institute.

### ***Conclusion: Transfer or No Transfer?***

In Latin America, curriculum composition plays a similar role as in American community colleges. But the real possibilities of transfers remain much more limited. In fact, they are the exception, rather than the rule. Our warnings are loud and clear, particularly considering how much American community colleges extol the virtues of the transfer function and try to export it. Given the curricular structure of four-year programs and their high degree of rigidity, is it difficult to create bridges with four-year programs. Attempts to do so tend to end up in short-cycle programs that are devoid of job preparation, losing their appeal to those who want a degree and a job at the end of two years.

In the United States, some programs closely parallel the first two years of



university programs and consequently offer a high degree of transferability, whereas others are less compatible, their main purpose being to meet the demands of the labor market. Programs in business, communication, education, engineering and basic sciences fall into the first category, whereas insurance, nursery, early childhood care, fire sciences, architecture technology and agriculture fall into the second. American community colleges try to establish firm agreements with universities and publish the terms of the agreements in their course catalogs so that students know the rules for and possibilities of transfer from short to long careers.

However, in Latin America, practically the only path to transfer is to enroll in an institution that offers both the short and the long cycle. It is only the motivation to keep students longer that drives institutions to allow for transfers. Short institutions and their stakeholders lack the clout to change the curricula and rules of four-year institutions, be they public or private. And the limits to transfers are at the long not the short cycle institutions.

Other challenges posed by transfer between programs in higher education include:

- *Preventing academic drift and ensuring employability.* Internal transfers are relatively easy, but when universities offer short programs there is a risk of academic drift and a danger that students of the short-career programs will not be adequately prepared for the workplace.
- *Preventing short-career programs from losing their distinctive purpose and appeal.* If a short-career program is a clone of the two initial years of a university program, it will not adequately prepare graduates for the labor market. Moreover, it may attract the most privileged candidates, and its cost will likely be comparable to that of conventional higher education programs.
- *Finding a workable balance between short-term employability and long-term advancement.* Policies regarding transfer may allow a greater number of students to reach lower-level goals, at lower cost, with considerable employability, or allow a smaller number of students to go farther, by means of transfers, but at higher cost and with likely loss of or delay in employability.



- *Determining how the system can be fine-tuned to offer the greatest good.* The question policymakers must deal with is whether to offer broader possibilities to a few students (from more privileged backgrounds) or to offer more limited possibilities to a large number of students (from less privileged backgrounds). In other words, diversified post-secondary education careers may ensure higher or lower occupational status and social mobility in relation to their public and private costs.

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## IS WHAT'S GOOD FOR THE UNITED STATES GOOD FOR LATIN AMERICA?

The safest answer to the often-asked question—is what's good for the United States good for Latin America?—is that no single answer applies to all situations. In other words, it depends.

A key assumption of this book is that community colleges offer important ideas for education in Latin America and should thus be the subject of careful study. A second point is that some features offered by community colleges are more relevant to Latin America than others. No principle can be replicated point-by-point in every context. For starters, public institutions across the region lack the flexibility and dynamism necessary to operate such comprehensive and flexible educational institutions. Without public subsidies, the private sector would be unable to offer what community colleges—nearly all of which are run by the public sector—normally do. Yet, many concepts from community colleges are worth considering in terms of the development of short undergraduate programs in Latin America.

### **An Inspiration for Latin America**

In Europe, most countries administer rigorous exit examinations at the end of secondary education. Students who do not pass are channeled toward vocational training, technical courses or apprenticeships, none of which allows for easy transfer to university-level education. Just as important, tracking starts even before the end of secondary education. In France and Germany, just to cite the examples of two countries with deservedly famous systems of education, an important proportion of the age cohort at the end of primary education is directed to vocational alternatives that do not permit transfer to mainstream higher education.

In contrast, the United States has a different tradition that inspired, with limited success, the post-war comprehensive school in some Western European countries. The European system of tracking was initially proposed and rejected in the United States at the start of the 20th century. Instead, the country opted for single high school programs, capturing the entire age cohort. This is the well-known “comprehensive high school” where both academic and vocational subjects are offered. Rather than discussing the failures and successes of this model, we simply point out that in the last several decades, this system has been under pressure to change. The wide range in the performance of graduating students is one of its most regrettable features. Lacking an exit examination (now being imposed in a few countries) but having heterogeneous enrollment, the system has been unable to effectively teach students at the lower end of the distribution of scholastic aptitudes. Hence, the less successful graduates of U.S. high schools are poorly prepared to enter conventional higher education institutions. In this sense, the poor preparedness of these graduates is comparable to that of their Latin American counterparts. This weakness at the lower end of the school aptitude distribution may be the most important reason why lessons from U.S. community colleges are important for Latin America.

Community colleges provide a more flexible, career-oriented option for students who may not have made the grade on rigid, high-stakes exams. In this regard, community colleges can be seen as a subsystem of higher education that compensates for the poor quality of education offered at the secondary level in the United States. At the same time, they are a response to youth unemployment and higher skill demands from the labor market, two emerging challenges in numerous Latin American countries. But, as mentioned, perhaps more important than any of these factors is the fact that U.S. secondary school graduates are similar to many of their Latin American counterparts who have not mastered the official curriculum for a variety of reasons.

Consequently, community colleges are a better starting point for Latin America than are Germany’s *Fachhochschulen* or France’s *Instituts Universitaires de Technologie* (IUT), especially since the latter are much more elitist than American community colleges and have rigorous entrance requirements.

The recent jump in secondary school enrollments in several Latin American countries has created a growing supply of graduates at this level, placing additional pressure on higher education enrollment. The only possible result of

this situation would be a drop in the quality of the post-secondary education provided to this emerging clientele. Even if the quality of the schools remained constant, the schools would receive an ever-larger number of students from lower socioeconomic strata who are less well equipped to succeed in traditional academic settings.

Traditional courses in economics, law and management cannot meet the needs of this new wave of students. To continue along the same road as before would be to swim against the tide of the experience of more educationally advanced countries. Educational options must be found—options that are practical, concrete and relevant to the labor market. Yet there is no need to invent solutions. The models are here for all to see, and the most immediately applicable is the community college.

It could even be said that the community college model is right for the wrong reasons—that is to say, because of the weaknesses and lack of quality control of the U.S. high school system. Perhaps so, but the fact is that this is a system developed and fine-tuned to students who have less than stellar academic records. And to a large extent, Latin American secondary schools also produce a large proportion of graduates who are academically weak. Therefore, community colleges would seem the right fit for Latin America.

## **Short-cycle Courses and Social Mobility**

Frustration is mounting in Latin America with regard to the lack of responsiveness by universities to the needs of society. Despite the surge in university enrollments over the past 20 years, higher education continues to be accessible to only the privileged segments of society. Moreover, Latin American universities have rarely seen their missions as encompassing anything other than academic education. When they have ventured into the area of short technical programs, they have generally “academicized” them to a point that has made them irrelevant for the immediate requirements of the workplace. By and large, universities have not done a good job of fostering partnerships with local communities, industries or businesses.

As the coverage of secondary education across the region and the quality of that education remain high for a few and rather poor for most, diversity in talent and preparation for post-secondary studies among high school graduates will

only increase. Some will be willing and able to undertake traditional university programs; far more will be unable to do so without further preparation or will prefer to enter the labor force as soon as possible with something more than a high school diploma.

Such diversity will be the hallmark of the new clientele for higher education. This is the profile of the student populations nearing the end of their secondary education and considering the options available in terms of higher education. Societies across the region will have to respond accordingly, diversifying post-secondary education to accommodate new needs and new populations. To continue offering more of the same would not only be extremely shortsighted, it would be inequitable.

Existing technical training institutions at the post-secondary level have dealt only partially with these needs. With few exceptions (e.g., SENAI), links with industry and business in terms of curriculum development and technical assistance have been weak or absent, and there has been little flexibility in program design and delivery. The possibility of transferring credits to a university program remains nonexistent. The present structure of Latin American higher education, with few exceptions, is simply not ready for that reform.

In much the same vein, higher education is woefully ill equipped to deal with students of diverse backgrounds and interests. The region's universities tend to offer high-quality education for those who can afford it—both economically and intellectually—and a mimicry of the same model for those who cannot. The result is an ineffective education with fewer resources that is unable to differentiate between clienteles.

Community colleges—or their counterparts elsewhere—are ideally suited for providing post-secondary education to diverse populations. Their diverse programming is a better match between study opportunities and student needs and capacities. It also combines flexibility in schedules and pedagogy with modest tuition levels and a proximity to labor markets that ensures relevant course offerings. Notably, the last of these benefits—orientation to labor market demand—is particularly appealing in that it serves two other worthwhile items on the agenda for higher education reform in Latin America. Links to the labor market act as a quality-control mechanism, reinforcing on the outcomes side what accreditation and other regulatory mechanisms achieve on the input and process side. Close links to employers also prevent institutions from becoming solely or

predominantly reliant on public funding, encouraging them instead to develop and maintain diversified funding structures in which private resources are an indispensable resource.

To be sure, postulating the need for community colleges in Latin America is a delicate issue. Consider a typical line of reasoning associated with left-wing politics: that the wealthy offspring of the privileged classes pursue university education in traditional majors that will prepare them to take over the reins of economic, political and intellectual power. Since the poor are now beating down the doors of higher education, the powers that be give them something simple and unpretentious—two-year post-secondary education—to keep them content so that they won't bring down the level of elite public universities. Give or take a few changes in wording or intellectual fashions, this paraphrases an oft-stated criticism levied against two-year post-secondary education.

However, we need to consider how other countries have dealt with the issue of inequality, i.e., the fact that students arrive at the end of high school with different levels of academic preparation, family income and individual predisposition. Both the richest countries and those with the strongest commitments to equality of opportunity do not create single tracks of higher education with the same courses of the same duration offered to all students regardless of their individual differences. U.S. community colleges and the large variety of two- or three-year programs offered in Europe are specific responses to a less affluent clientele. To bring home the point, no single developed country has failed to create different tracks within higher education, yet in no country is the correlation between tracks and the socioeconomic background of students even close to zero. From the point of view of social origins of students, the tracks are somewhat mixed. Some less academically inclined middle-class students attend short courses, and high-achieving working class students take elite university courses.

People are looking for a way to make a living and for some, taking the liberal arts route is a waste of time or the wrong approach to education. Indeed, all countries grapple with serious equity issues, as reflected in their educational policies. Most recognize that a family's sociocultural setting determines characteristics that even the most expensive of schools cannot counterbalance. By the time students reach post-secondary education, differences in interests, priorities and—most important—scholastic aptitude are evident. The best that can be done in an imperfect world is to design schools that are better able to further develop

each student's potential. (Here the meaning is not *genetic* potential, since the impact of the environment is already enormous by the time children reach school age).

If this is true for the richest and the best-educated countries, how can Latin America ignore such experiences? There appear to be only two options for Latin America, at least from a practical standpoint: either to provide differentiated education that accommodates the nuances of varying student profiles (with the poorest students directed toward education targeted specifically to them), or equal schooling for all, which is likely to lead to a more dysfunctional, even hostile, system for students with less-than-optimal educational backgrounds. No other options beyond utopia have been found to date.

In Latin America, debates on such topics have been monopolized by those who prefer the comfort of such utopian notions to the discomfort of the real world. It is either sheer hypocrisy or wishful thinking to imagine that Latin America could create a fairer system than the ones already created by nations that have allocated considerably more resources to education and have made infinitely stronger commitments to equal opportunity and equity goals. If those countries found it necessary to create a divided, differentiated system of higher education, how can Latin America expect to do otherwise?

The position taken here is that it is better to have short courses for poor students and longer courses for rich students than to have long courses for the rich and nothing suitable for the poor. However, for this duality to be ethically acceptable, every effort must be made to ensure that all screening is based on scholastic aptitude rather than socioeconomic background. The rich should not have an entitlement to the more elite programs; the poor should have the same right of access and must be admitted when their academic profiles so justify. Elitism can be intellectual, but not social.

## **Commitment to Work with the Less Capable**

A comparison between higher education in the United States and Canada and that in Latin America would immediately show how elitism plays a role in how Latin American countries run their institutions. At first glance, such elitism appears to exist as well in top U.S. and Canadian universities. They relentlessly look for the very best students, snub their lesser peers and focus on lofty academic pursuits.



In that respect, they are no better or worse than the corresponding Latin American institutions of higher learning. Yet, what differentiates the two regions is that the United States and Canada also have institutions with a strong commitment to the “other half.” This is, perhaps, one of the main lessons for Latin America. Community colleges take great pride in having open admissions and working with whoever enrolls. This is an integral part of the official rhetoric of presidents and deans and the pride of faculty and administrators. Unable to compete with the more elite institutions in recruiting the best students, unable to do research with the resources and faculty available, the community colleges’ search for identity leads them to be the champions of equity. They take pride in their ability to turn poor high school graduates into highly skilled workers. They even avoid hiring PhDs as teachers because they do not see in them the commitment and the patience to teach their academically weaker students.

True enough, there is nostalgia for the high life of academia and academic drift can be found here and there. But this strain of elitism is contained by the strong ideology of equity and service to the less capable students.

By contrast, this book has reviewed a number of short-cycle Latin American institutions where such commitment is conspicuously lacking. In fact, most of those institutions in the region consider upgrading the quality of the students they accept to be an important goal. While there are a few outstanding two-year programs in Latin America comparable to the best in Europe and the United States, none have the objective of choosing weaker students and taking up the challenge to provide them whatever they need to grow. Accepting less endowed clienteles as their own and attempting to bring the best out of them is a lesson that Latin American institutions could learn from the community colleges.

## **Innovations in Teaching**

Technological advances hold out vast potential for the field of education, particularly in Latin America. In wealthy countries, computers, television and other tools are among the more common luxuries to be adopted by educational institutions, often for no reason other than that they exist. Latin America, however, does not have the same abundance of such luxuries. It must make more rational use of available technology because of the region’s limited number of high-quality human resources to manage such programs. Technology broadens the scope of

influence of excellent instructors and materials far beyond what is possible through strictly conventional means. A class taught by an excellent teacher and recorded on video can be reproduced for thousands of students at negligible cost. For the region, then, the use of new technologies in education is neither a luxury nor the culmination of a process of pedagogical enhancement. Rather, it is an expedient solution, a means of replicating successful classroom experiences quickly and inexpensively.

Again, the American community college model is the best around in this respect. While four-year schools tend to be conservative in their teaching methods, community colleges can provide low-cost, innovative, and broad-based education. Rather than being a pedagogical laboratory for the rich, with constructivist professors intent on meticulously reinventing the world's knowledge, community colleges provide education for the masses, broadly defined, are more creative and aggressive in using technology, and employ less prestigious teachers.

Given the secondary status Latin America has afforded to post-secondary education for the less affluent, attention to better or different teaching methods has been notably absent. The lower the level of scholastic aptitude, the more important it is to have better teaching methods that are tuned to the needs of students. In that sense, community colleges teach the right lesson: pay attention to the needs of students, the method of teaching, and the offerings of technology to improve educational delivery. This is another lesson Latin America should take seriously. This is not a matter of cultural subservience, but rather a lesson in principles. Students should be offered what maximizes their potential for personal growth, whatever it might be. And nobody can be against better teaching on ideological grounds. Therefore, the large number of Latin American educators who travel to the United States or Canada on study tours would be well advised, if they are interested in better teaching methods, to skip the prestigious universities and visit the down-to-earth community colleges.

## The Market Imperative

Fewer and fewer graduates of Latin American four-year universities are finding work in their major fields. These schools prepare young people for a market that is open to all diploma-holding professionals, regardless of their areas of special-

ization. More affluent students can find their way into these diffuse markets, land jobs where there is potential for growth, and eventually do well. This is what the steep angle of age-income profiles of graduates of good universities tells us. University graduates end up better than all others, but start very slowly, more often than not in jobs unrelated to their diplomas. Master's and doctoral degrees are now needed to get jobs in specific fields that correspond to the diploma.

By contrast, one- and two-year careers focus on specific job markets and provide well-targeted preparation for graduates going into those fields. This enables graduates to get immediate access to well-paying jobs. In fact, these jobs often have initial salaries that are higher than those of run-of-the-mill university graduates. In the United States, some two-year programs can lead to well-paid jobs in their respective fields. Average starting salaries for graduates of the top five programs offered at community colleges—dental hygiene, manufacturing processes technology, telecommunications or information specialist, physical therapy assistant, and registered nurse—are all in the range of \$30,000 a year (American Association of Community Colleges, 2000).

In Latin America, an overarching concern should be the extent to which these shorter vocational programs prepare students for local job markets. Again, community colleges offer many lessons and experiences in aligning courses with local job markets. From what we know, lack of curricular flexibility and mismatches between curricula and job markets can negatively affect salaries in short courses. Stated bluntly, if a program does not prepare students for jobs in the field to which it pertains, it isn't worth much. The fact that graduates of community colleges can command relatively high salaries is directly related to occupational specialization embedded in community college curricula and the attention given to market evolution. By contrast, much less time is devoted to acquiring general knowledge. The trick is as much opening up new courses to respond to increased demand as closing down courses when demand is no longer there. This is where community colleges do much better and act much more quickly than four-year programs.

Latin American higher education has been plagued by its poor response to market needs. Needs resulting from new skill profiles often go unmet, and, worse, the system keeps producing graduates long after the corresponding positions have been filled. This is not serious with four-year education in the social sciences and the humanities, where students ultimately acquire basic skills that they can

use in whatever they do later on (more often than not unrelated to their diplomas). But in short-cycle education, time is precious. There is not enough time to develop the broad and diffuse skills that one can get in four-year programs, and students do not have the same scholastic profile. They are less comfortable with abstraction per se. They need something concrete, but if that education comes in an area where the market is saturated, what can they do with it? This is the worst of all possible worlds.

The experiences of community colleges, therefore, provide Latin America with important lessons in terms of adjusting to markets as they expand, shrink and change occupational profiles. If Latin America could learn only one lesson from community colleges, it would be how to relentlessly adjust to market changes.

## Titles and Status

When discussion turns to human capital and investments, there is a tendency to focus on aspects of education that impact productivity and to overlook the contribution of sociologists. Actually, the decision to continue one's studies is influenced deeply by the symbolic value of a degree. A degree brings status, which is a perception of self-worth or a feeling of belonging to a higher level of society. It is not a question of agreeing or disagreeing, but rather of acknowledging that the value of higher education consists of much more than return on an investment.

Along the same lines, the name given to the degree is important (even if not for the right reasons) and affects individual behavior. Courses viewed as leading to less prestigious degrees are less attractive to potential students. The British got it right when, with one stroke of the pen, they changed all their "polytechnics" into "university colleges." Schools everywhere soon followed suit, adding the magic word *university* to their names.

Although the name given to courses is thus a consequential matter, there is of course no intrinsic value in any give name. Distinctions between "post-secondary," "higher education," and "university" are largely determined by context and the eye of the beholder. They are not inherently meaningful, and no amount of tweaking will create meaning where there is none.

What name should two-year post-secondary institutions in Latin America

be given? Technical schools? Technological institutes? Community colleges, as in the United States? As the British case illustrated, this is an issue of some importance—playing the status game wrong can ruin an otherwise sound effort to develop short post-secondary education.

In recent times, administrators of two-year technologist courses in Brazil struck gold when they rechristened their courses. By law, technologist courses are considered higher education. When programs advertised that they prepare students to be technologists, the reception was lukewarm. When they offered “two-year higher education programs,” the response was much greater. Never mind that these are the same technologist courses, from a legal point of view. They had learned how to play the status game.

Status is not the only factor upon which the success or failure of the community college model will hinge. Expectations of the promise of community colleges must be met with concrete results. Improving quality is essential. In some countries (e.g., Chile and Argentina), enrollments of institutions devoted solely to two-year programs sometimes account for as much as 40 percent of total enrollment in higher education. At least some of these students have ignored the lure of prestige in favor of educational choices based on supply and demand. The demand for high-quality, job-ready skills is great, and the supply of qualified technicians is limited. Having said that, however, it should be noted that enrollment in Chile fell due to the poor quality of its short post-secondary programs. Low-quality courses may continue to draw students, as long as a better alternative is not available, but enrollment will nevertheless decline.

Two-year post-secondary schools may up the ante on the prestige side if they can establish a strong link between courses of study and sound occupational preparation. In a very real sense, this is exactly what has given Brazil’s SENAI and SENAC their prestige. The fact that their students, for many reasons, fall outside the university system does not remove the imperative of providing them with viable options for study at the post-secondary level. And this is exactly what has been done. A significant number of students who already have four-year degrees have been attracted by these institutions’ highly focused programs that target top-paying markets.

For those who choose to continue study toward four-year undergraduate degrees, a functioning transfer system likely would help solve the prestige or reputation problem. Study at a community college would be seen as the first step

toward completing a university program. Recent experiences have shown promise along these lines. Argentina's *colegios universitarios* are particularly noteworthy. Since 1995, the nation's 1,800 non-university post-secondary institutions (*terciarios*), most of which are public, have been permitted to enter into partnerships with the universities to offer transfer programs to their students. A *terciario* with a transfer agreement with a university—which entails a supervisory relationship called “accreditation”—can call itself a “university college.” To date, some 300 *terciarios* have transformed into university colleges (see Taquini, 2000). However, given the rigid structure of four-year courses in Latin America, this is a very limited and difficult solution.

Finally, to reiterate a point alluded to above, nothing attracts customers like good quality. Reluctance to enroll in short programs may be due to a perception—entirely accurate—that the programs have little to offer in the way of marketable skills. In this scenario, students are not avoiding vocational and technical schools because they crave status, but because they are rational consumers. They understand that, while the opportunities opened by a university degree are more a function of possessing the degree than of what one has learned in the process of getting it, the opposite is true with technical diplomas. Therefore, investing in a degree that does not teach marketable skills, though perhaps justifiable in the case of a university degree, is useless in the case of technical programs.

## **Bridges to Four-year Programs**

In the United States, early two-year programs were designed as no more than bridges that provided links to traditional four-year programs. Although this preparatory function has been gradually overtaken by studies leading to “terminal” associate degrees, the bridge concept—i.e., the possibility of transferring to four-year programs upon completion of two years at community colleges—is alive and well. Furthermore, some public universities have established branches on community college campuses, making it possible for transfer students to complete their junior and senior years at the locations at which they obtained their associate degrees. Recently, a new twist has been added: community colleges, particularly those in the northeastern United States, are offering two-plus-two programs, awarding both associate and bachelor degrees, in sequence.

It is common for Americans, who are proud of their community colleges, to

promote the benefits of being able to transfer to regular four-year courses. While this is feasible and justifiable in the United States (and to a lesser degree in Canada), the situation in Latin America is markedly different. Misdirected efforts to promote the transfer function in Latin America have created problems, some of which linger.

The first “operational engineering” courses offered in Brazil were created with the provision that they would provide bridges to regular engineering. But in order to make the short courses transferable to four-year programs, it was necessary that these two years become almost clones of the standard courses taken by four-year students in their first two years (To wit, courses taken by technicians were almost equivalent to the first two years of engineering education.). This, in turn, encumbered the two-year programs with too many theory courses, leaving little time for practical training. Thus, two-year graduates gained neither the practical skills that would enable them to find jobs nor the preparation in math and physics necessary for success in regular engineering schools. All in all, what could be termed a “bridge” in other contexts was, for all intents and purposes, little more than a mini course in engineering, one in which both theory and practical training were sacrificed. The implications were serious. The theoretical courses that would make students “university-ready” were shortchanged, due to the presence of some practical courses. But the practical training content—i.e., the “reality check” that serves to align courses with market demand—was also shortchanged, leading to poor market prospects after two years.

The failure of bridges in the Brazilian system points to the differences between Latin America and the United States. However, it merits noting that the bridges in the United States and Canada were not built overnight. They had to be fought for—and to some extent continue to be—in every program and with every university. Bridges entail negotiations over curricula, and it is owing to the difficulty of these negotiations that community colleges create transfer offices whose sole responsibility is to remove obstacles to transfer. In some instances, bureaucratic and institutional considerations smooth transfers between two- and four-year institutions. For example, some American colleges, traditional and community, use the same codes for transferable courses. More recently, mutual recognition has been extended to entire programs, particularly biotechnology and computer science programs. In others, such as engineering, bridge courses continue to be necessary.



Today, transfers are widely applied in the United States and Canada and are not restricted to programs in general education or the humanities. Graduates from technical programs can transfer as well, but, given the applied nature of their instruction, are often required to take extra classes, called “bridges” in Canada, to acquire the academics of the next level of education. This is why vocational and technical programs, in general, are not considered “terminal.” (In general, associate of science degrees are considered to be terminal.)

The traditional lack of two years of general education in higher education programs in Latin America, which is replaced by the early professionalization of curricula, poses a major obstacle to transfers. Two years of liberal arts or vocational courses simply do not have enough overlap with the first two years of law, psychology, engineering or veterinary medicine. For transfer to be feasible, either the two-year course must be overburdened with theory classes or the four-year courses must be more general and allow for more optional subjects in the first two years. In general, the problem is that programs that offer low-prestige, two-year courses are unable to persuade four-year programs to change their syllabi for the first two years. And in many cases, the individual schools do not have the freedom to change course structure, the official curricula being imposed by central authorities.

Since these Latin American courses have their origins in continental Europe, it should come as no surprise that the European transfer function is also very limited. Ultimately, the problem is one of transferring the studies of an American-inspired program to a European-inspired four-year career.

Notably, however, the initial curricula of four- and five-year programs are becoming increasingly more general and dissociated from the future diploma. Recent legislation in Brazil is moving in this direction. This may be due to shortcomings in academic preparation in the region’s high schools, but also to the realization that a stronger general education basis is necessary, given the overwhelming disconnect between diplomas and jobs. That is, the program-specific focus is giving way to emphasis on general education. If this trend continues, the problem of transferability could be alleviated.

Summing up, the Canadian notion of establishing additional courses that amount to a “bridge” between technical programs and university study shows promise for Latin America in that it avoids blunting the technical edge of programs in the name of making them transferable. Efforts have been made to integrate the



general education curricula of two-year liberal arts programs into traditional, professional programs in universities across Latin America. But, with few exceptions (e.g., UNICO in Mexico), successes have been few and far between.

Transfer remains the most elusive aspect of the community college model as applied in Latin America. The problem ultimately lies with the highly structured and vocational nature of university programs and the extent to which universities dominate higher education. This is not merely a matter of prestige. It is also a reflection of the fact that universities wield political power, particularly in matters related to education financing and their presence on the boards and management structures that decide on curriculum. Given such asymmetries in power, four-year programs are unlikely to change in order to accommodate the needs of the students of short programs. Therefore, those who are in charge of short-cycle education are well advised to be very skeptical with respect to the short-run possibilities of transfers to four-year programs.

## **The Intricacies of Certification and Accreditation**

The United States has a long tradition of certifying students or officially accrediting courses.<sup>1</sup> However, U.S. education follows patterns that are quite different from Latin America with regards to legal control and interference with the operation of individual schools. In fact, many systems are voluntary (e.g., certification of auto mechanics) and many are maintained by labor unions (e.g., the construction industry) or professional associations (e.g., ABET for engineering technology programs; NLN and AAPT, among others, for health care; AVMA for veterinary studies). Such voluntary and nongovernmental accreditation systems simply do not exist in Latin America.

U.S. community colleges are accredited by the same commissions that are responsible for accrediting four-year colleges and universities. But in strict terms, accreditation is only necessary to maintain the transferability of degree programs. It is possible to operate post-secondary institutions without accreditation, even though most reputable schools are accredited. This is in sharp contrast to most

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<sup>1</sup> Exceptions include fields that pose risks or security issues for service users (e.g., health professions, airline pilots and mechanics, and truck drivers). These fields fall into and are governed by federal and state systems for individual certification.

Latin American countries, where prior authorization from the Ministry of Education is required to open a higher education program.

Regardless of these mechanisms, however, few of the professions served through community colleges are governed by legislation or agreements as stringent as those found throughout Europe, where virtually all occupations are certified. This is one reason why courses at community colleges can be created and changed relatively freely, without legal repercussions. The flexibility of the U.S. system has obvious advantages, especially in fields such as technology that are constantly changing. Furthermore, the system is open to experimentation and incremental changes in curricula, programs and content.

The situation in Latin America is somewhat different and more favorable than in the case of four-year courses. Most of the regulated professions require four or five years of university preparation. The so-called technical professions have not yet been taken over by entry restrictions based on a diploma but they inherit the same rigidity when a diploma is required to perform the corresponding four-year career. The construction industry is perhaps the one most fraught with professional certifications and regulations. Newer fields such as information technology and business in general remain largely unregulated.

Following from this, anyone interested in offering courses in regulated professions faces a critical decision—whether to follow the official curriculum and accreditation or put all that aside and risk the test of the market. On the side of officialdom are the comfort, peace of mind, and dubious benefit of being able to say that the course follows official guidelines. The other side of the coin is that traditional curricula tend to be outdated and, when all is said and done, graduates of traditional university programs must still pass the market test.

But accreditation of one- or two-year programs in Latin America follows no single pattern. There are both restrictive and lax procedures, old and new systems. Any imaginable scenario can be found somewhere. Venezuela created its system several years ago. Brazil is putting the finishing touches on its new set of standards. Indeed, given such a variety of systems, it would be difficult to make valid generalizations about the region. Perhaps the best one can say is that, overall, the accreditation and general regulations are not particularly enlightened. This is an area in which several countries will have to do the initial work of fixing the older systems. As a result, any policy prescription in this area has to follow a country-by-country approach

## Policy Guidelines

Higher education in Latin America is in the midst of a serious crisis brought on by legislation that has created both distortions and limitations. Costs may be too high for what is actually achieved in many courses. In other cases, there is not enough money to offer a decent education.

To remedy the situation, higher education in the region must become more flexible and adaptable to a wide variety of situations and clienteles. This is no easy task. In some countries, public universities voice strong opposition on ideological grounds to any change in the focus and mission of higher education. Thus, by default, the task of reshaping higher education will fall to the private sector, given the public sector's lack of funds and reluctance to spur innovation, change paradigms, or upset the status quo.

That said, full-scale implementation of something close to the U.S. community college model cannot be accomplished by the private sector alone. The private sector simply does not have the necessary initial capital and clientele and is unable to defray the operating costs of institutions playing similar roles to those of U.S. community colleges. Because the clienteles served would come primarily from disadvantaged socioeconomic backgrounds, full-scale implementation of community colleges across the region would require funding beyond what students can pay. Consequently, without the participation of the public sector, full implementation of the model will be impossible.

The establishment of a community college system of any scope requires sizable investments in curriculum development, preparation of teaching materials and textbooks, and teacher training. In the absence of these investments, most of which came through the public sector in Europe and the United States, the effort becomes an exercise in improvisation. In Argentina and Chile, quality suffered when many responsibilities for post-secondary education were transferred to the private sector. Shortsighted and tightfisted approaches to delivering training led to improvised and often shallow courses. Teachers were unprepared and the quality of curricula and texts unacceptably low. This has a set precedent in that it has tarnished the reputation of an area of training that is still in its infancy (de Moura Castro and Navarro, 1999).

In conclusion, the public sector has a role to play in the development and support of one- and two-year courses. Under current conditions, however, it is

highly unlikely that, in most countries, public institutions will be interested in taking a significantly more proactive approach. This leaves a vast market open for the private sector, which conceivably will be the fastest growing segment in the coming years. But it would be unrealistic to expect the private sector to tackle this task with only its own financing, especially given that short courses are normally offered by small-scale operators to an often “unprofitable” clientele. One promising trend in Brazil has seen large and prosperous proprietary universities opening two-year programs at a fast pace. These schools have the means to undertake the initial investment in developing such programs. But this remains the exception, and as is the case with small businesses in general, public subsidies will be necessary to defray the start-up costs involved in creating high-quality courses that use good materials and are taught by well-prepared instructors.

### ***Policy Proposals***

The first difficulty in proposing policies for two-year courses in Latin America is the scarcity of data. In general, technical and short post-secondary education is plagued by statistics that lack a minimum of comparability in this area, if they exist at all. Teaching programs may be aggregated with industrial training or nursing or lost inside regular four-year programs. If a region-wide policy in this area is to be designed, the first line of business is to improve information.

Compared to other levels of education, there is very little analysis of short-cycle post-secondary education. Knowledge of what has worked and what has not is sorely lacking, particularly in Latin America. In very few cases can the success or failure of a program be based on sound empirical information.

### ***Institutional Framework***

The present policy vacuum in the region regarding two-year programs, coupled with a general lack of examples upon which to model programs, make it difficult to design optimal programs. There is a need for sound policy guidelines to structure short-cycle education into a broader framework of higher education. Status is certainly as important a consideration as it is for long-cycle education, and policies must recognize the power of titles, certificates and diplomas. The official representation of heads of institutions is also essential. They must be given

equal footing with heads of other higher education institutions, and they must participate in events where policies are discussed. Above all, the private sector should not be involved in these forums.

### *Accreditation and Certification*

Accreditation procedures can force a threshold of quality and facilities on private institutions that may protect prospective students from dishonest or incompetent operators. But the Latin American experience is fraught with unreasonable demands, extreme formalism and cumbersome procedures. In particular, requirements of degrees from teachers are often distorted, particularly in cases where professional experience is more relevant. By the same token, the lack of any requirements to establish closer links to the market is also a foregone opportunity to create the right incentives. In the worst case scenario, a free-for-all is preferable to the straight-jackets prevailing in some countries.

Competency-based accreditation is a promising prospect. Experience is growing in terms of establishing clear and measurable competencies that are required by different families of occupations. There are good reasons to choose a few critical areas and develop pilot projects along these lines.

Curricular guidelines can be useful to frame programs, educate smaller operators, and avoid irrelevant programs of study. When such guidelines are the result of consultations with employers, they bring to individual schools a kind of knowledge otherwise difficult to acquire. However, the guidelines should not constrain the natural evolution of the market and business practices. Nor should they ban experimentation. Flexibility is essential. In some areas, such as computer science and applications, the speed of change can be greater than the time it takes to change official curricula.

While European curricular patterns have pervaded Latin America, certification of skills is still not common in the region. Prime candidates for which individual rather than institutional accreditation could play a much greater role include health-related professions, repairs of automobiles and appliances, and computer skills.

## *Need for Public Investment*

Private institutions take cues from their better-endowed and higher-status public counterparts. This suggests the convenience of creating a few leading institutions on the public side, whether they be called magnet schools or experimental programs or some other name. These institutions can serve as a reference for smaller and less informed counterparts.

Governments could also establish some lines of funding—either loans or grants—to help private institutions in areas where their vulnerability is greatest, such as with expensive laboratory and workshop equipment. Teacher training would be the most helpful of all, the easiest to implement, and involve the least risk. By creating programs to train teachers or to have them trained elsewhere—in some cases abroad—governments create a public good. Individual institutions, even when they can afford the training, will not do so because of the potential of poaching by the competition. This is a classic case where the state has to intervene to avoid under-investment.

In new areas—and such is the case with many short-cycle careers—there are no suitable books, syllabi, course structure or trained teachers in the market to be purchased or imitated. A small operator can create a law school by imitating the one on the next block and, as happens, taking some of its teachers. But courses in textiles, ceramics, quality control, wine-making, air conditioning and many other fields lack trained teachers, good teaching materials and curricular guidelines. Obtaining those resources is beyond the means of the typical small program. If small operators are to offer serious educational programs in these areas, they need public support. It makes all the sense in the world for the government to invest in curricula, teaching materials and all such public goods that support educational endeavors in such new areas.

## **Is the Community College a Viable Model for Latin America?**

Latin America is not likely to be able to replicate all the details of the community college model, but the model does remain viable, albeit with some caveats. From a financial perspective, the private sector has limited capabilities to cover all costs, particularly the heavy initial costs of preparing materials and training teachers. The public sector—stifled by Byzantine legislation, inflexibility, and lack of

collaboration, even among agencies within the same ministry—is limited as well.

Still, the community college model brings many important and appealing ideas. The high school graduates who would attend the community colleges represent the up-and-coming clientele of higher education across the region. It will be incumbent upon governments to find and implement viable options that satisfy the demands of this clientele for post-secondary study and job preparation. Indeed, the focus of the community colleges on market-ready skills not only provides a direct link between school and work, but also has the potential to raise the profile and prestige of short courses throughout much of the region. After all, if community colleges are unable to mitigate prestige issues, supply problems will persist and the viability of the model will be called into question.

Some modalities of short courses are economically viable for the private sector operating without subsidies. As is the case in the United States, business, computing, secretarial and health-related areas can stand on their own. The private sector will likely concentrate on these areas. By contrast, highly technical fields that require expensive equipment and laboratories will remain off limits to the private sector.

In many respects, the restricted versions of one- and two-year programs offered by U.S. proprietary schools are a model much easier to replicate. They focus on the lower-cost courses for which students with modest means can afford to pay full cost. To a large extent, this is where growth is most concentrated in Latin America.

The U.S. and Canadian experience gives Latin America much food for thought. The model has proven to be a workable means of expanding the reach of tertiary education. It has also produced notable results, especially in terms of a qualified response to youth unemployment, an increasingly shared problem of the Latin American countries. The community college model thus has the potential to inspire Latin America to create its own version, incorporating some of the ideas that have been successful in the northern hemisphere.

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## GUIDELINES FOR BUILDING A COMMUNITY COLLEGE<sup>1</sup>

This appendix outlines the basic steps to be followed in planning and building a community college. The steps are deliberately general, since there is no single recipe and each situation is unique. Nevertheless, three general areas should be covered: making sure you understand the distinctive role of community colleges, developing a master plan, and carrying out the master plan.

### **The Distinct Mission of Community Colleges**

The community college has a distinct mission that is related to but fundamentally different from that of the four-year college and university. For this reason, instituting an effective community college system requires careful planning that takes into consideration the institution's defining qualities.

Regardless of the grand scheme, individual colleges will differ in size and location. The economic strengths and weaknesses of their communities, as well as the styles of support provided by those communities, will also vary. Nevertheless, certain defining characteristics are common to community colleges and set them apart, both functionally and philosophically, from four-year colleges.

*The community college is a multipurpose institution* that provides education for transfer, education for employment, general education, and community service. In so doing, the colleges offer a wide variety of programs, including:

- University parallel programs that are comparable to the first two years of a university education. Community college programs should always take into consideration the extent to which they prepare students for further education.

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<sup>1</sup> This appendix was prepared by David Ponitz.

- Technical education programs that provide the skills necessary to obtain high-level positions that require skills in mathematics, science, and critical thinking. Community college programs emphasize both head and hand skills.
- Continuing education for adults. Compared to the enrollments of four-year colleges and universities, community college enrollments include a relatively large number of adults. Some are just beginning their post-secondary education, while others are returning to college for further education or are gaining skills required by emerging fields such as information technology.
- Developmental education. Part of the mission of the community college is to assist people who need help in reading, writing, mathematics or science prior to beginning post-secondary-level work. Unlike some four-year colleges, community colleges do not take the position that students who need remediation are not “college material.”

***The community college is an “open door” institution.*** Unlike some universities that take pride in *excluding* students, community colleges place emphasis on *including* students who can benefit from a community college education. Even though individual courses may be highly selective, community colleges in general put post-secondary education within the reach of a large number of people representing a wide variety of interests and abilities. Rather than weed out students who are not academically outstanding, community colleges strive to provide whatever help is necessary to ensure that every student succeeds to the extent to which he or she is capable. Reaching this goal requires careful testing and course placement; without these, dropout rates become unacceptably high.

***High-quality guidance is an essential responsibility of the comprehensive community college.*** Because the average student age at a comprehensive community college may exceed 30 years, guidance and counseling must be appropriate for a wide range of students—from recent high school graduates to middle-age or sometimes older students. Though many community college students are preparing to enter the workforce for the first time, many others are preparing for second careers, updating their technical skills, or expanding their career options. Because of the broad demographics represented, community college counselors must

have excellent people skills and must understand how curricula and testing serve diverse student needs.

***The community college is within commuting distance of its student population.*** For the most part, community colleges do not have residence halls. To be able to afford tuition and other expenses, most community college students live at home or elsewhere within their communities. This is why community colleges are often called “commuter colleges”—students live off campus and travel to the campus each day by car, bus or train. In many states, more than 90 percent of the population lives within easy commuting distance of one or more community colleges.

***A relatively large percentage of community college students work off campus.*** It is not uncommon for 75 percent of a community college’s students to work full or part time. Compared to four-year colleges, community colleges generally offer more flexible scheduling that accommodates working students.

***Community colleges provide programs that are consistent with the realities of the workplace.*** While most people still consider four-year colleges the surest path to success (as opposed to subsistence), only about 20 percent of jobs require four years of post-secondary education. Well over half (around 65 percent) require post-secondary technical training that can be obtained in two years or less. Consequently, community colleges offer tremendous potential for economic and workforce development, and their offerings are within reach of a very large number of people.

***The public community college is the community’s college.*** Community college offerings are designed to support the education and economic development initiatives of communities. In addition to university-parallel programs, community colleges provide programs that are specifically adapted to local needs. There are many examples—Texas has petroleum technology programs, Kansas has agribusiness programs, California has high-level information technology programs, and Ohio has programs that emphasize manufacturing. And the list is growing, as community colleges become increasingly numerous in U.S. population centers.

***The responsibilities of the community college extend beyond the classroom.*** Community colleges are the cultural, social, and job placement centers of their communities.

## Developing a Master Plan

Starting a community college requires sound decision-making, establishing priorities, and a timetable for action. It is a complex and difficult process that requires stamina, the empowerment of faculty and staff members, and a vision of the future—and how to get there.

The principal tool in the planning and implementation process is the master plan. This section describes what a master plan accomplishes, the work that should be done prior to writing the master plan, and the areas that it should cover.

### *What a Master Plan Accomplishes*

A master plan is necessary for two reasons. First, the process of developing it helps to clarify many issues that would otherwise remain unclear. The development process is an invaluable exercise in self-evaluation. Second, the plan itself becomes a blueprint that spells out the steps to be taken, provides a timetable, and outlines the mechanisms to determine whether the goals of the plan are being met.

A well-written master plan:

- Requires communities to assess their needs, capabilities and readiness to develop and support community colleges. Working through the assessment process helps communities clarify their positions on many issues, strengthens community pride, and leads to the formulation of unambiguous goals for the college system under consideration. The master plan is an effective way to inform the public of progress to date, challenges that have been met, and steps necessary to improve service. The assessment process requires dedicated leadership.
- Defines goals that transcend politics and special interests. The master plan defines what is best for the geographical area to be served by the college system (state, region or nation) and protects the greater good from petty politics and unreasonable local pressures.
- Gives the planning process a logical format by prioritizing objectives and specifying timetables. It also helps to define priorities by encouraging planners to answer such fundamental questions as: What are the real needs? What steps can be taken to ensure that those needs are met? How

are area needs likely to change over time? What priorities should be established to ensure that funds are expended efficiently and effectively?

- Establishes a mechanism for systematic allocation of responsibilities and resources among participating institutions. This is essential because meeting the needs of the entities involved requires an understanding of the functions of each type of higher education—and coordination of the total effort.
- Lays the foundations for continued planning by providing the flexibility necessary to adapt to long-term changes. The plan must have built-in mechanisms for ongoing and realistic assessment of progress. Those mechanisms must clearly specify methods of progress and establish benchmarks for identifying and modeling best practices.
- Specifies processes involved in the delivery of services. The master plan lays out guidelines for systematic and efficient delivery of routine and universal services, including accounting services, establishing tuition rates and setting guidelines for scholarship offerings, and academic and career counseling, including facilitation of entry into the workforce
- Identifies the makeup and roles of advisory groups. Because community colleges play vital roles within communities, their advisory groups should reflect the diversity of their constituencies. Consequently, each college's advisory groups should involve community representatives, faculty members, students and others with specific interests in the development of college programs. The master plan should include guidelines for the formation of advisory boards and should state the roles of each group.

### ***Work Prior to Developing a Master Plan***

**Conduct research.** A well-designed master plan should be based on careful research that includes:

- Clearly defined market surveys that ask for detailed answers to questions concerning college and community needs.
- Thorough analyses of community needs along with projections of how

those needs are likely to change over time. The analyses should be carried out by a broadly representative committee made up of professional educators—not just university types—and representatives from business, industry, health and human services, labor, and the general public.

- Demographics of populations to be served and how the makeup of those populations is likely to change over time
- Analyses of available resources and the potential for developing additional resources in the future.

***Develop a long-range vision.*** The master plan should reflect long-range planning that will help developers gauge community expectations over time and estimate projected enrollments; project educational needs and develop programs that will meet those needs; determine the fiscal resources that will be required during each phase of the system's development; and determine how available and future resources can be matched to needs

***Determine the locus of control.*** There is some debate about where control should lie. Some people believe that only total control at the state level will yield fair opportunities for all students; others argue that local control is preferable because it develops a heightened sense of pride, provides for flexibility in meeting community needs (which will vary from community to community), and encourages excellence. Still others advocate a blend between state and local control. This is an issue that calls for careful consideration and debate before a final decision is made.

Whatever balance between state and local control is struck, every bureaucracy must look well beyond itself. That is, state bureaucracies must be sensitive to local differences, and local bureaucracies must be sensitive to broad trends in workforce needs so as to ensure, insofar as is possible, that community college graduates are prepared to succeed not only in the communities in which they attend school but in communities across the country.

### ***Areas a Master Plan Should Cover***

The master plan should define the educational needs of the college's prospective students. This is best approached by answering questions regarding the needs of the players involved:

- Educational needs—What opportunities are available? Are these adequate? What additional opportunities should be made available?
- Workforce needs—Is there a shortage of trained workers? In what areas? Are these areas that could be well served by graduates of technical associate degree programs?
- Financial needs—Do local demographics suggest that many students will encounter financial barriers to enrollment? If so, what steps can the college take to remove those barriers? What effect will those steps have on the college's fiscal strength?
- Resource development needs—Are available resources sufficient to build a community college system? If not, what additional resources can be brought to the project? What are the long-term prospects for resource development?

The master plan should answer each one of these (and related) questions thoroughly.

***Balancing local needs vs. general workforce needs.*** The master plan should recognize that every community has unique needs stemming from local industrial and business specialties and demographic and socioeconomic factors. But the plan should also recognize the need for students to acquire general workforce skills and basic skills in technical areas that are in high demand. For example, if the college is to be located in an area where local industries use automated manufacturing technology, the master plan should make provisions for offering associate degree programs in computer-assisted design (CAD), automated manufacturing systems technology, electromechanical technology, fluid power technology, and similar fields. These programs would provide graduates with skills that would be not only marketable locally—immediately after graduation—but transportable to other places. Similarly, any master plan, regardless of specific local needs, should make provisions for training in information technology, since IT skills are in high demand everywhere regardless of industrial focus. Any master plan should also make provisions for helping students acquire general workplace skills such as SCANS skills.

***How entities interact.*** The master plan should identify the entities involved and, more important, how the entities interact and work together as a system. Again, the best way to approach this process is by addressing a series of questions:



How do public and private institutions in the state interact? Are their programs complementary or independent of one another? How will the community college's credits prepare students for further education at four-year colleges and universities? What steps can be taken to ensure that the community college's credits will transfer to four-year programs? Will the credits also transfer to private colleges?

***Current and future sources of funding.*** Careful attention must be paid to the financial viability of the college over the long run. The critical questions here are: What sources of government funding are available? Are there opportunities for local levies to improve scope and quality?

### ***Carrying Out the Master Plan***

The specific tasks involved in carrying out the master plan fall into six major categories: curriculum and instruction, student services, staffing, financing, plant and facilities, and working with the community.

***Curriculum and instruction.*** Development of the curriculum involves five steps, each of which must be taken with careful consideration of the others. The steps are to (1) define the purpose of the college; (2) develop programs to meet that purpose in both the long and short term; (3) execute curriculum programs; (4) define metrics to determine whether goals are met; and (5) revise, add and delete programs.

Getting started is difficult, but there are several approaches that help stakeholders prioritize educational objectives.

First, a community survey should be conducted. The survey need not be complicated, but it should go into sufficient depth to help college planners select initial courses and programs. The survey should involve focus groups as well as public surveys. By identifying the needs of the community, the planners will be able to determine which programs should receive the highest priority.

A citizen advisory committee must also be established. From the beginning, it is helpful to have community support for governing board actions. Having a citizen advisory committee helps to keep community members informed and provides a channel for communicating the college's progress to the public.

From the beginning, both college-transfer and technical programs should be offered. A number of students will want to transfer to four-year institutions, while



others will seek job skills that can be acquired in two years or less. The mission of the college is to serve both.

The college should explore innovative ways to meet the needs of all students. A number of new approaches to teaching at the community college have emerged during the past several years, including contextual teaching and teaching with the use of new computer applications.

Contextual teaching is a strategy that presents abstract concepts in familiar contexts and emphasizes the usefulness of the concepts outside the classroom. If technology can be integrated into the process, the strategy can be even more effective. Contextual teaching is designed to help the middle 50 percent of the student population understand complex mathematical and scientific concepts and acquire critical thinking skills. Contextual teaching was pioneered by CORD ([www.cord.org](http://www.cord.org)), a nonprofit educational organization in Waco, Texas that develops products and services that facilitate contextual teaching. To date, 15 million students each year have enrolled in programs that involve contextual teaching. This approach has been the entryway to quality jobs for literally thousands of students.

Innovative computer applications also can help students acquire skills faster and understand concepts more thoroughly than conventional teaching practices. Distance education, as well, offers great promise because it makes the college's curriculum available to students everywhere. Given the importance of computer applications in education, the start-up team of any community college should include one or more computer-learning specialists.

Innovative learning initiatives that can be implemented in support of a college's curriculum and instruction include learning resource centers and on-line communications tools. Many other initiatives are possible and should be explored. In general, such innovations are based on recognition of the fact that the old-fashioned method of lecturing and reciting will not produce an enlightened workforce.

Each community college should have a learning resource center that provides books and printed materials, films, recordings, computers and other learning tools. Provision of useful materials in a "one stop" configuration is a helpful service to students and faculty members and encourages full use of the materials.

Development of online catalogs, schedules, calendars and sources of information to complement printed materials about job opportunities is an essential

communication process that is now generally expected of post-secondary schools. If a new community college is to “keep up with the times,” it must plan and budget for development and maintenance of up-to-date sources of information that can be consulted from any Internet-connected computer. Distribution of materials on CD is also a cost-effective method of making large amounts of information readily available. Local media sources should be enlisted in this process.

**Student services.** Community colleges are based on the “open door” concept, i.e., that all students who have graduated from high school or are over 18 should be eligible to enroll. Community colleges are founded on the belief that, through innovative teaching techniques, most people—not just the top 10 percent—can learn complex and useful skills. This idea lies at the heart of the community college mission.

Because of the open door concept, community colleges must provide services that accommodate students of widely varying abilities, goals, ages, levels of motivation and backgrounds. The diversity of community college enrollments mandates a broad range of student services. All student services—admissions, counseling (including academic, career and mental health counseling), guidance, academic and job placement, testing, and a wide range of student interest activities—should be based on recognition of the broad diversity of the student body.

One area in which student services should be especially sensitive to diversity is placement. Every effort should be made to place students in appropriate learning environments—neither too difficult nor too easy—that serve their academic needs while preparing them to move on to the next step, whether it is a more advanced course, transfer to a four-year school, or entry into the workplace. Proper placement is critical to student motivation. Devising an effective system for placing students requires collaboration between counselors and faculty members.

One of the most important student services that the college should provide takes place after students graduate. The master plan should provide guidelines for conducting studies that assess student success in transferring to four-year colleges or entering the workforce. It is essential that faculty members and administrators receive periodic information about their former students’ progress or setbacks. The college must have this information if it is to take corrective action and make necessary improvements. This process is ongoing and should be part of the college’s overall self-evaluation and improvement effort.

**Staffing.** The charter faculty and staff members will largely determine the initial direction of the college. It is essential that administrators and staff members understand and are committed to the community college concept. With that understanding and commitment, much progress can be made. Without it, the promise of a high-quality community college is greatly diminished.

Good staffing starts with effective policies for hiring faculty members and administrators. To the extent possible, faculty members should be people who have demonstrated high proficiency in their academic areas, are dedicated to student learning, and, when appropriate, have non-teaching work experience related to their areas of specialization. All three elements are important (the first two critical)—professional competency, genuine interest in student learning, and an understanding of how the real world works.

Administrators should be similar in outlook and experience to faculty members, but should understand management of complex organizations and should have proven leadership skills.

A faculty handbook should be developed early to allow faculty members to understand their roles, functions and specific responsibilities. The handbook should include a clear organizational chart that identifies responsibilities and accountabilities.

Administrators and faculty and staff members should be extensively involved in planning and development before students arrive. Activities in which they should participate include curriculum development, student counseling, communication with the community, class scheduling, development of operational logistics, and the planning of activities to welcome students to their new learning environment.

**Financing.** Finding sufficient operational funds for the first year and into the future is essential in the development of a community college. The system's master plan must include mechanisms for ensuring long-term funding for operations, maintenance, facilities, equipment and reserves.

The following are recommendations for steps that should be taken during the resource development process. (Because the financing of community colleges differs widely from state to state and from country to country, the recommendations are general.)

- Provide a sufficient budget to ensure highly qualified staff members, adequate facilities, up-to-date equipment, and other items essential to a successful start-up and continuation of the college's programs.
- Keep student tuition low enough to attract students from all economic backgrounds.
- If possible, start the planning process a year early. Develop an initial budget for the college.
- Secure state, federal and local funding and determine the stability of each funding source. Many U.S. colleges follow a formula for expenditures—one-third state and/or federal, one-third local, and one-third student.
- Determine whether and, if so, how much tuition will be charged, and establish scholarships for people who would profit from community college education but cannot afford tuition.

***Plant and facilities.*** Facilities represent a large expenditure and require extensive short- and long-range planning. The following are guidelines for developing facilities.

- *Temporary vs. permanent*—Many new colleges take a two-phase approach to facilities development: first, “get started” in a temporary facility, and then, move into a new and permanent campus built according to the master plan. The first step to take in this area is to determine whether the college should set up shop in temporary facilities or wait until permanent facilities are ready.
- *Plan according to the college's focus*—If technical programs are a major part of the curriculum, a considerable amount of funds should be spent on high-tech equipment that is comparable to the equipment used in industry. If the college's technical facilities do not provide experiences that are relevant to what is taking place in industry, the training will not prepare students for the workplace.
- *Don't skimp on design*—Efficiency in the expenditure of facilities funds is a must. The best architect or consultant affordable within the planning budget should be hired to ensure maximum efficiency in the use of space and smart planning for future expansion.

***Working with the community.*** Strong, mutually supportive relationships between community colleges and their communities are vital to the success of both. The following are “community relations” points that should be taken into consideration during the planning process.

- High-quality institutions have “reciprocal nudging” agreements with their communities. They listen and respond to high-priority needs of the community. Most community colleges will tell you that “community” is their middle name and insist that the phrase signifies a commitment to action and involvement.
- As soon as “service areas” of colleges are determined, the colleges can add a variety of delivery systems that support activities at the central campuses, e.g., satellite centers, distance learning facilities, and remote computer laboratories.
- Depending on community needs, community college programs may include one-year certificates, specialized training that can be completed in less than a year, and honors credit.
- In many instances, the community college will be a “catalyst for action,” bringing community groups together to meet challenges. A true community college must be involved with the hopes, dreams, aspirations and problems of the citizens it serves.
- The community college works in concert with other groups in the community—and helps them to fulfill their goals. Cooperation is key.

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## APPENDIX

# 2

## COMMUNITY COLLEGE FUNDING IN TEXAS<sup>1</sup>

Prior to the meeting of the Texas legislature every two years, the Texas Higher Education Coordinating Board compiles enrollment statistics, applies formulas to individual disciplines, and recommends a total funding amount to the legislature. Unlike appropriations to universities, the community college appropriation is a single amount divided among the 50 community college districts on the basis of contact-hour enrollment.

The difficulty is that the Texas Legislature has never funded the state's community colleges at the full formula rate. Over 1995-97, for example, the appropriation was at 59 percent of full formula funding. This percentage was increased to 64 percent for 1997-99 and to 71 percent for 1999-2001 as a result of the diligent efforts of community college administrators, working through the Texas Association of Community Colleges (TACC). TACC is funded by the state's community college districts and represents them before the legislature and state agencies. The goal of TACC is to reach full formula funding by 2007. When the legislature convened in January 2001, it was asked by community colleges to raise the funding level to 81 percent.

Along with other state agencies, community colleges are in competition for appropriations. State revenue is insufficient to fund all agencies at the desired level, so each legislative session evolves into a contest to see which agencies can convince legislators of the merits of their funding requests. Community college leaders are at somewhat of an advantage in this process, since they are united in promoting a single block allocation of funds. Universities, on the other hand, are

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<sup>1</sup> This appendix was prepared by Leonardo de la Garza.

funded separately and must argue their own individual cases. Also beneficial is the sheer number of community college districts in Texas. Each of the state's 31 senators and the vast majority of the 135 members of the House of Representatives have community colleges located in their districts and thus are receptive to entreaties by "their" colleges.

Texas is close to the national average in its level of public funding for community colleges. For 1996-97, state appropriations accounted for 43.3 percent of public community college revenue nationwide. In Texas, the figure was 40.8 percent. In that same year, the average amount appropriated per state resident nationally was \$15.91, while in Texas the amount was \$15.87.

## Local Tax Revenue

Most community college districts in Texas levy two tax rates. One—the maintenance and operations, or M&O, rate—raises revenue for general operating expenses. The other—the debt service, or sinking fund, rate—generates income to pay interest on bonds sold to finance construction projects or for major capital outlay purposes. The remainder of this discussion will deal with only the maintenance and operations tax rates.

The level of state funding of public community colleges in Texas has not kept pace either with enrollment growth or with the cost of educational programs. To make up the difference, Texas colleges have had to increase their dependence on their two other sources of revenue—local taxes and tuition and fees. The average M&O tax rate in 1999–2000 was 14.68 cents per \$100 worth of property, an increase of 7.4 percent from the average only two years before.

Maintenance and operations tax rates vary widely among Texas community colleges. They are based on two factors—the amount of revenue necessary and the wealth of the community college district in terms of taxable property. The colleges with clear advantages are those whose districts contain large numbers of heavy industries, since the land on which these industries sit is much more valuable than if occupied by residences. A district with a very high property valuation is able to raise its needed revenue at a much lower tax rate than some "poorer" districts.

It is no surprise, therefore, that the districts with the lowest M&O tax rates tend to be those in large, urban, industrialized areas. The Dallas County Community College District's rate, for instance, is one of the lowest at 5 cents per \$100 in



property. The highest is that of Western Texas College—31.43 cents. Property in Dallas County, however, has a total value of \$109 billion, while that of the Western Texas College District—largely farm and ranch land—is \$586 million.

Texas community colleges are very cautious when raising their tax rates, taking care to articulate clearly the need for added revenue. State law provides that any district proposing a tax rate that would generate 8 percent more revenue than in the previous year could face an election in which the voters could reject the proposed rate. In that event, the rate would revert to that of the previous year.

## **Tuition and Fees**

As do most U.S. colleges and universities, community colleges express cost to individual students in terms of two categories—tuition and fees. Tuition in Texas is an amount paid per semester hour, with that amount depending on the number and nature of the courses taken. Most semester-length lecture courses count for three semester hours of credit. Many courses that have both lecture and laboratory components (such as those in the sciences) are four semester hours. Other courses can carry more or less credit.

Students pay various types of fees. Some are associated with specific courses, such as laboratory fees for science courses or courses requiring extensive materials. Others are for specific services, such as transcripts or parking permits or graduation fees. Still others are of a general nature and are paid by every student. These charges may be labeled “building use fee” or “student services fee” or “publications fee” or any of a wide variety of fees authorized by state law. Most are charged on a per semester hour basis and are therefore largely indistinguishable from tuition to the student.

Just as state appropriations and local taxes should be considered together to make comparisons between states, both tuition and fees should be considered in comparing the cost to students in different community colleges. A low tuition rate may be offset by a higher-than-average fee structure. Tuition at Galveston County College, for instance, is the state minimum of \$8 per semester hour, but its fees are among the highest.

Five three-hour courses—15 semester hours—are considered a full academic load, and average tuition figures are normally based on this load. The Texas

Association of Community Colleges, however, bases its comparisons on 12 semester hours, an academic load much more typical of the average community college student. The average tuition and fees paid by a public community college student in Texas taking 12 semester hours in 1999-2000 was \$377, an increase of 10.8 percent over the prior two years. In Texas, therefore, upward pressure brought about by falling state funding levels has had more of an effect on tuition and fees than on tax rates.

Tuition and fees are fairly uniform throughout Texas' public community colleges. Students at half of the 50 districts paid between \$350 and \$400 in 1999 for a 12 semester hour load that includes one laboratory course. College of the Mainland in Texas City was lowest at \$222, and Texas Southmost College in Brownsville was highest at \$706. As they do nationwide, however, public community colleges present the most affordable option. The average annual cost of \$754 compares with \$2,022 for the average state university and about \$12,000 for private universities.

### **The Local Perspective: Tarrant County College**

The total budget of Tarrant County College for 2000-2001 was \$141.7 million—\$129.9 million for maintenance and operations and \$11.8 million for debt service to retire bonds. The college derives the bulk of its operational funds from the same sources as other public community colleges in Texas—state appropriations, tuition and fees, and local tax revenue. And, just as elsewhere throughout the state, the cost to local taxpayers and students has risen dramatically as state funding has decreased. In 1985, state funds accounted for 70 percent of the college's income. In the current year, that percentage has fallen to 30 percent.

The 30 percent figure is deceiving because of a large increase in local tax revenue that will be discussed below. The actual numbers have increased—from \$32.5 million in 1997-98 to \$39.5 million out of a total operational budget of \$129.9 million in 2000-2001—but the level of funding still has not kept pace with the cost of instruction.

## *Tuition and Fees*

The decline in state funding has brought about a corresponding rise in tuition and fees at Tarrant County College. As late as 1984, the tuition rate for credit classes was \$4 per semester hour. Tuition was increased in 1985 for the first time in the history of the college and has gone steadily upward. Tuition and fee revenue made up 19 percent of total college revenue in 2000-2001.

Tuition at Tarrant County College is set by the Board of Trustees, acting on recommendations from the chancellor. Before making the recommendation, the chancellor receives a recommendation from a tuition committee, first formed in 1998. This committee, comprised mainly of students, studies tuition trends at other colleges and universities as well as the financial needs of the college. Credit course tuition at Tarrant is \$28 per semester hour for residents of Tarrant County, the taxing district. Residents of other Texas counties pay a \$12 per semester hour out-of-district fee, and the tuition for students from other states and for international students is \$140 per semester hour.

Credit students also pay a facilities use fee of \$6 per semester hour. This brings the combined tuition and fees paid by every student to \$34 per semester hour for county residents, \$46 for residents of other counties, and \$146 for out-of-state and international students. In addition, there are incidental fees for laboratory courses and a student services fee of \$1 per semester hour with a maximum of \$10. The total tuition and fee bill, therefore, for a county resident taking 12 semester hours, including one laboratory course, is \$442. This is above the state average, but still less than half the cost of a state university.

Noncredit fees are established on a course-by-course basis. Most fees aim to recover the cost of teaching the courses, plus some administrative overhead. Some technical and vocational noncredit programs, however, receive state funding in the same way as credit programs and are thus priced below actual costs.

One segment of Tarrant County College's student population deserves special mention in terms of tuition. As do most states that border Mexico, Texas has a significant number of undocumented residents who are not U.S. citizens and have no formal immigration status. Many have lived in Texas and in Tarrant County for years, if not all their lives, and have graduated from Tarrant County high schools. In many cases they or their parents have owned property and paid taxes in the county—including the Tarrant County College District tax.

While courts have ruled that undocumented residents must receive the same free public education as U.S. citizens, state regulations mandate that they be classified as nonresidents for purposes of tuition at state colleges and universities. To extend the benefits of higher education to this segment of the population, however, Tarrant County College has joined with the Dallas and Houston community college systems in a plan whereby undocumented residents in these districts pay the same tuition as do other county residents.

The state of Texas has agreed to this practice as long as the contact hours of these students are not submitted for state funding. The Texas Association of Community Colleges, however, argues that the benefits to the state of providing higher education to this segment of the population are such that the regulations should be changed. Accordingly, the TACC sought legislation in 2001 to extend state funding for undocumented residents in state colleges and universities.

In summary, tuition and fees likely will continue to rise at Tarrant County College. Similar upward pressure, however, will continue to be exerted on state universities as well. As a result, student costs at Tarrant will continue to be well below those of the state universities.

### *Local Taxes*

Tarrant County College's maintenance and operations (M&O) tax rate, like those of many of public community colleges in Texas, has increased in recent years. One reason has been the need to raise more revenue to offset a leveling off of state funding. The other reason, however, is part of an important and innovative change in the college's method of funding construction and major capital outlay expenditures.

For many years, the college had one of the lowest combined tax rates (M&O plus debt service) in the state. As recently as 1994, this combined rate was about 4.6 cents per \$100 of property, 47<sup>th</sup> among the 50 community college districts. The rate climbed about 1 cent in 1995 after passage of a bond issue to build the newest campus. From 1995 to 1997, the M&O rate was increased to generate more operational revenue, and the 1997 combined rate was about 5.8 cents.

In 1998, the Board of Trustees, on the chancellor's recommendation, approved an M&O rate of 9.011 cents per \$100—a 131 percent increase over the 1997 rate. At the same time, some existing bonded indebtedness was paid off, causing

the debt service rate to fall from 1.8 cents to 1.6 cents. The new combined rate, therefore, was 10.641 cents, more than double the previous year's rate.

At the heart of the increase was a basic change in the philosophy of funding construction and major capital projects. The chancellor, in outlining his plan to the Board of Trustees, argued that, with bonded indebtedness, only about 66 cents of every dollar spent by the college actually went toward construction or purchases. The rest went to pay interest on the bonds.

He proposed, instead, a "pay-as-you-go" approach in which such projects would be funded from maintenance and operations revenue. These monies, collected from year to year, would be placed in reserve to fund purchases of major equipment, building renovations, construction, and other categories of expenditure heretofore funded from bond funds. The plan has two major advantages. First, it provides a secure method of funding major projects in that the college does not have to go repeatedly to the voters for authorization. Second, no interest is paid, meaning that every penny of every dollar goes for actual expenditures.

In a public hearing on the proposed rate increase, required by state law, more citizens spoke in favor of the increase than against it. The local news media, satisfied that it would provide a far more effective and efficient method of funding major projects, endorsed the plan editorially.

In 2000, the chancellor expanded on the pay-as-you-go approach. Acting on his recommendation, the Board of Trustees enacted the funding method as official policy and called on the chancellor to prepare a five-year plan, to be updated each year, outlining the projects to be funded. This approach to major project funding is thought to be the only one of its kind in Texas and perhaps in the nation.

Even with the dramatic increase, however, only 15 Texas colleges have combined tax rates lower than Tarrant County College's rate of 10.641 cents. The rate also is one of the lowest levied by any taxing entity in the county. The average public school district tax rate, for instance, is about \$1.38 per \$100 of property. The average value of a home in Tarrant County is \$93,171. The owner of a home valued at this figure would pay \$99.14 this year in Tarrant County College taxes.

The pay-as-you-go approach to capital project funding has had an important side effect. In addition to providing an efficient method of financing such projects, it has vastly increased an ancillary source of revenue—interest on funds held in reserve. Agencies at various levels of government in the United States—including public colleges and universities, public school districts, and municipi-

palities—consider it good practice to keep funds in reserve. The ideal amount recommended by agencies that rate governmental bodies according to their fiscal stability is three months of operating expenses. Since Tarrant County College has set aside reserve funds not only for basic operations, but also for capital projects, the reserve is much larger than normal and thus yields more interest when invested. The budgeted interest income for the college in 2000-2001 was \$4.1 million—3 percent of total revenue anticipated—compared to \$1.7 million in 1997-98.

In summary, Tarrant County College expects the amount of maintenance and operations revenue it collects from local taxes to continue to increase. This increase, however, may not be reflected in a corresponding increase in the total tax rate. One reason is that, as bonds are retired, the debt service rate will decrease. Another reason is that, as property values in Tarrant County continue to increase, more revenue can be realized with no change in the M&O rate.

## VOCATIONAL TRAINING IN OKLAHOMA

The speed of technological change has increased so rapidly in the last few years that experience is becoming an almost irrelevant asset when it comes to hiring employees. What matters is the ability of a worker to think through the overall manufacturing system involved in the fabrication process. Workers who can only work with their hands are becoming a relic in an increasing number of occupations.

Oklahoma's community colleges form part of the state's highly effective training system, considered by educators and industrialists throughout the country as one of the most comprehensive and innovative systems in the United States. A key ingredient of success is that the goals were very clear from the beginning. The state wanted to develop a critical mass of highly skilled workers who understood the value of quality work habits and procedures and could compete with the leading industrial states. The aim was to be able to offer incoming industries attractive packages for training all their workers in whatever trades or specialties they might need.

Over 21 years, Oklahoma has developed a unique system that links high schools, technology centers, community colleges and universities, thus enabling students to move freely between these institutions, carrying credits for courses completed. Critical to implementing these career and community college programs is that the system—which was built by a handful of conscientious, energetic and persistent educators, rather than just by laws, decrees or plans—involves a large army of school managers with a clear sense of purpose and the right attitudes to forge in the right direction. The system also involves considerable decentralization and diversity. Individual schools follow general guidelines from the state's VoTech Department, but are free to creatively follow the paths that best suit their needs (i.e., catering to their local markets and targeting the specific needs of individual enterprises).

## Links with High Schools and Colleges

Oklahomans have managed to establish functional and mutually advantageous links both with high schools and higher education. The state operates a secondary-level vocational program and a multitude of in-service training and upgrading programs for adults, including the well known 2+2 formula. Parallel to their efforts to sell training to the various industries, for instance, schools aggressively recruit high school students, who often visit the nearest VoTech school as early as sixth grade. Middle school students have the opportunity to spend one week during the summer sampling different vocational school programs in order to explore different career possibilities. In addition, VoTech administers a test to all 8<sup>th</sup> graders to ascertain their interests, motor coordination and academic ability levels. The same test is given again to the same students when they reach the 10<sup>th</sup> grade to verify consistency of results in all dimensions. The close working relationship with regular schools, the entire higher education system, and state businesses and industry greatly enhances the value and achievements of the training system.

## Outsourcing Training

Forward-looking enterprises increasingly concentrate their in-house activities on what they do best and outsource everything else. This includes employee training, since a school is conceived to teach and is expected to do it better and cheaper than a factory that has other objectives. The key to successfully outsourcing training, however, is the competency of the local training institutions. Oklahoma offers such competency, enabling enterprises to unload their training to VoTech and concentrate on what they can do better.

## Demand-Driven Education

More and more often, the workplace is demanding workers with strong critical thinking skills. Even classic occupations such as truck driving are changing their skill profiles, since truck drivers often have to operate on-board computers and global positioning systems (GPS) to communicate with headquarters. Car mechanics have to deal with new automobile models that come out of the assembly



line with 600,000 pages of technical literature. In contrast to their counterparts in some European or Asian countries, who have strong cognitive skill backgrounds, the average American student is unable to reach the threshold of basic skills required by the new industrial occupations. In the Stillwater Vocational School, for instance, 95 percent of students who enroll in avionics have never taken a trigonometry course. As a result, it is necessary to offer remedial courses in these areas. This is often done by using the concrete context of the same technical occupations that are being taught as a launching pad for the development of cognitive skills.

Oklahoma's training responds to a clear demand from real profit-motivated enterprises and not to needs imagined by educators. Thus, industry personnel develop curricula, and courses are created and discontinued depending on the jobs that are in demand. The system succeeds in remaining demand-driven without becoming a demand victim by keeping on top of market trends and business cycles. Reasonably informed decisions often have to be made concerning the relationship between course offerings and fluctuations in the business cycle.

## **Apprenticeship**

VoTech is carrying out a number of experiments in apprenticeship, some of which have served as models for the federal program "Craftsmanship 2000." For instance, there is the Oklahoman version of PrepTech, a national program sponsored by the Center for Occupational Research and Development (CORD). This is called the 2+2+2 scheme. The first "2s" stand for the regular Oklahoma system of training, with mornings in school and afternoons at VoTech (or vice-versa). The last "2" takes place at an enterprise. This program has been called "Co-op Training" in Oklahoma and its attractive feature is the strong link between training received and a concrete job waiting ahead.

## **Largest Producers of Industrial Materials**

The VoTech Curriculum Center has become one of the world's largest producers of industrial materials for vocational education. These include more than 400 different courses and 400 videotapes for 42 different topic areas. The materials cover technological descriptions, workshop practice, written exercises, final tests,

transparencies for overhead projectors, lists of workshop equipment, and supplies. Included as well are materials intended to develop basic skills, such as reading, math applications and creative thinking, giving schools the foundation they need to proceed.

## **The Francis Tuttle Vocational School**

The Francis Tuttle School was founded in 1979 and given the name of the founder of the VoTech system of Oklahoma. In August 1982, the school had 752 daytime students enrolled. Currently, more than 30,000 students are taking at least one short-term course. They have a wide variety of courses to choose from, since the school offers more than 30 daytime education programs and over 300 short-term courses.

### ***Multidimensional Nature of Skills***

Francis Tuttle prepares its student for critical thinking while teaching them lifelong skills. A hallmark of its main technology program is the multidimensional nature of the skills taught. The orientation of the courses is based on two main findings. First, not only do some firms offer higher wages to workers with multiple skills, but also in periods of crisis firms do not lay off these types of workers. Second, there is an immense market for the maintenance of complex equipment.

About one-third of the school's students are young people who divided time during their last two years of high school with vocational training (the 2+2 formula). The remaining students attend either to participate in cooperative programs with local colleges, or to get an associate degree in one of the technical fields offered. Many firms hire young people with associate degrees because they see them as potential candidates for supervisory positions. Francis Tuttle is one of several schools that, besides offering its regular programs, contracts with enterprises to train their workers in short- or long-term courses. When this is the case, a needs assessment is conducted, and on the basis of that assessment the school designs a custom-made program to fit the needs of the specific enterprise. While the needs assessment can be a major undertaking, customizing the program is often a simple process, since the school already has training modules for almost everything an enterprise might request.

Even when they are not customized per se, school programs are developed in close collaboration with industry to ensure that courses will prepare students for jobs for which there is high demand. More than 300 business representatives review the school's curricula and course content through their participation in various program advisory committees.

### *Technology for Training*

Each instructional program at Francis Tuttle is fully equipped with industry standard equipment. The total value of the school's vocational equipment is more than \$10.9 million. The school's services and programs include a teaching factory, advanced technology programs, and VAN SAT, which is an engineering and electronic commerce center provider. In addition, for distance learning the main campus has an 11-meter satellite teleport, the largest in the state. This enables students to surf the Internet during real-time interactive classes called "12 LIVE" as part of their daily activities, or to take specialized classes taught at other locations. 12 LIVE is the first cooperative network that can connect both city and rural schools to a vocational center, a community college and a university. Each classroom has remote-controlled cameras, television monitors, microphones and speakers. The teachers' workstation includes an image document camera, a VHS player, a computer loaded with software and connected to a laser printer, Internet access, and a fax machine.

The overall direction of all training is the operation and maintenance of a new generation of machines and technological equipment. The school works on the premise that the ability of enterprises to generate new technologies has far outstripped the ability of servicepersons to maintain them. As a result, these maintenance requirements will create more jobs in the next several years than the country is able to train individuals to fill. There is clearly a scarcity of maintenance technicians who can understand the mechanics, electronics and pneumatics of such machines. One interesting example mentioned at Francis Tuttle is the new generation of pagers transmitting through satellites. The technology and satellites are available, but there are few technicians who have the breadth of skills and the specific knowledge required to repair them.

## *No Lectures*

All courses at Francis Tuttle are competency-based. This alone testifies to the institution's commitment to provide serious training geared to the needs of industry, since such training clearly shows the links between training and expected performance. The approach involves teaching methods that avoid conventional lectures. At Francis Tuttle, all live lectures have been eliminated. Videotaped lectures, written materials and computers are used instead. Teachers are not replaced by but rather complement this process, so the valuable interaction between teachers and students is fully preserved. The school's experience suggests that not all students operate well with this system, and efforts are made to help those who have initial difficulties with computers and VCRs. The school uses one-to-one tutoring in difficult cases, a small price to pay for what is otherwise an interesting and effective innovation.

By eliminating lectures and using competency-based training materials, the system enables each student to move at his or her own pace. Students can join the course at any moment and leave when they finish their modules. They use Learning Activity Packets (LAPs) to advance and are required to take performance tests in order to demonstrate mastery of one LAP before moving on to the next. In this way, slower students do not impede the progress of fast moving student, while those same slower students can take as long as they need to fully master the contents. LAPs are an excellent tool for delivering competency-based instruction. Estimates based on similar programs elsewhere indicate that efficiency increases due to using LAPs can be quite substantial, depending on how they are defined.<sup>1</sup> On the downside, the fixed investment to operate with this method is consistently higher, the logistical problems much more pressing, and the administrative and technical overhead somewhat higher. Still, overall the method seems to be a step forward that, unfortunately, has not been taken up by many schools.

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<sup>1</sup> On average, students take only two-thirds of the time to finish the courses. Another 15 percent of students gain from repeating subjects they already know. Filling places left open by dropouts may account for savings of about 25 percent. A large number of school days increases productivity by 18 percent. See Oliveira and Castro (1991).

## *A Modular Program*

Perhaps the most interesting aspect of the courses offered by Tuttle is the modular nature of the curriculum and the vast common core of subjects. There are no more than five basic processes—mechanics, electricity, thermal, fluid and optics—which, taken together, encompass 13 major concepts (such as force and energy). All manufacturing processes are based on a combination of these processes and concepts. To become a technician, one needs an integrated view of all of them.

Students devote about 30 percent of their time to classroom theory work. The remaining time is spent on applications and hands-on activities. In addition, given the weakness of high schools in math and science and the importance of this type of knowledge in the various high demand occupations, remedial courses are offered to those who need them. Students spend about 60 percent of their time taking common core modules and the remaining time in specialization. Since the basic processes taught in these common core modules change very little over time and are common to all specializations, most of the course material needs no frequent updating. In electronics programs, for instance, 80 percent of the materials are the same in all the courses offered. Therefore, the fixed investment of developing a systems approach based on five processes can be justified.

The Francis Tuttle School remains committed to continuous quality improvement. Word of its intriguing achievements has spread worldwide. Tour groups from 47 countries—including Australia, Brazil, China, Great Britain, Pakistan, Russia and Saudi Arabia—have visited the school.

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## THE IMPACT OF SENAI RESEARCH AND DEVELOPMENT ON INDUSTRY AND VOCATIONAL TRAINING<sup>1</sup>

Acknowledged as one of the leading vocational training institutions in Latin America, as measured by the number of people it serves and the quality of its educational methods, the National Industrial Apprenticeship Service (SENAI - *Serviço Nacional de Aprendizagem Industrial*) is supported by Brazil's industrial sector and administered by the National Confederation of Industry (CNI - *Confederação Nacional da Indústria*). Its 722 operating units (of which 46 are National Technology Centers) are located throughout Brazil. In 2000, they registered 2.9 million students in their courses and programs, more than doubling the number of places available compared to the early 1990s. Over this period, the institution expanded the range of services offered to industry and began to include technical and technological assistance, technological information, and applied research, servicing over 16,000 companies in 2000.

Outstanding among these new activities is applied research, which sums up an institutional drive designed to upgrade the qualifications of human resources while offering higher value-added services. Applied research is a somewhat complex activity, as it involves risks and requires new management and financing models, as well as better access to high-grade resources and information.

In order to analyze the problems and the results of the technology-based drive, the National Department of SENAI completed a broad-ranging survey in 2001 of the development and impacts of applied research activities in the institu-

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<sup>1</sup> This appendix was prepared by Karla Régnier, Luiz Antonio Cruz Caruso and Paulo Bastos Tigre.

tion. Supported by consultants, this survey was carried out in three stages. The first was designed to assess the R&D supply conditions at the SENAI operating units. This analyzed 317 questionnaires focused on organizational issues, interaction with other activities, impacts and problems (SENAI, 2000). Despite the success of the survey in highlighting relevant impacts and little-known aspects of the innovative efforts of SENAI, the researchers acknowledged the limitations of these survey methods. Analyzing only the supply of R&D services could mask their limitations, insofar as many respondents tend to publicize positive impacts and downplay problems. Consequently, it was decided to compare the supply data with a demand analysis, in order to cross-reference this information. In Phase II, questionnaires were forwarded to companies that had acquired technology from SENAI. The comparison of these two questionnaires offered a more consistent and broad-ranging overview. For instance, it was noted that assessments of the impact of the innovations introduced by SENAI on these companies' competitiveness was generally very positive. This phase also revealed problems that were concealed during the first survey. The analysis of these questionnaires also needed to be supplemented by a close-up view of a specific case study, in order to check compliance with the reality and practical proof.

SENAI (1999) defines applied research as "the use of technical and scientific knowledge to generate new materials, new products or new processes for industrial enterprises," as well as "actions striving through systematic efforts to prove the technical/functional feasibility of new products, processes and systems, or introducing substantial improvements to existing versions based on technical, scientific and/or empirical expertise, or know-how obtained elsewhere. This involves the conceptual formulation, design, alternative ways of teaching, preparation of prototypes and the operation of pilot plants."

To use a universal language, this appendix uses the term "research and development (R&D)" to represent these activities. More specifically, the appendix looks to answer the following questions:

- How does SENAI react to business demands for R&D services?
- Are there appropriate incentive, management and assessment mechanisms for the in-house R&D activities?
- What sources of information and funding are used by SENAI and its customers?



- How are the results disseminated, and how is the interaction handled with other SENAI activities?
- What are the main strengths and weaknesses of SENAI in R&D?
- What reasons prompt the companies to contact SENAI to undertake research activities, and what is the assessment of its services in this area?
- What are the benefits and impacts of the projects for the companies?
- Do the companies use tax incentives and lines of credit available for R&D activities?

## R&D Activities

Research and development at SENAI has been based on the absorption of technological innovations for production processes, particularly since the 1990s. The better-equipped schools gradually began to offer services integrated with industry, since many of the problems facing the companies were not resolved solely through vocational training. Making good use of the SENAI laboratory infrastructure and its human resources, companies began to demand specific technological services, such as trials, tests and assays, process and product analyses, redefinitions of layouts, prototype development and the fabrication of special components and parts. The know-how generated by these activities and the rising complexity of the transformations demanded by the companies resulted in the consolidation of the concept of the National Technology Centers during the 1990s, absorbing this applied research. The initial phase of the survey showed that almost all (97 percent) of SENAI research activities took place at these centers. They function in many different fields of expertise associated with operating experience, and offer technical, technological and university-level courses, in addition to technological information services, technical and technological assistance, and applied research. The integrated actions of these four functions underpinned the acquisition and development of new competencies and know-how. The identification of 317 applied research projects indicates success that is unparalleled among peer institutions in the developing countries.

## *Demand Characteristics*

SENAI's R&D projects are undertaken mainly at the request of companies (40 percent) and at the initiative of the operating units themselves (33 percent), with universities and research centers also among the taker institutions (16 percent). Projects also involve cooperatives and other SENAI units, on a smaller scale, in addition to government entities, trade unions, associations and philanthropic institutions. In theoretical terms, the SENAI operations are based on both demand-pull and technology-push concepts. The former refers to explicit demands from companies that contact a technology center in order to solve specific problems or for technical support for their innovation projects. The latter is applicable to initiatives run by a center itself by using inventions and technological opportunities from the scientific or business world, including new equipment, materials, components and feedstock. Once their feasibility has been proven, these innovations are then offered to industry.

At SENAI, R&D activities focus mainly on the development of new products, equipment and tools as well as new production processes (quality upgrade solutions, cost cutting, less waste, higher productivity). Together these account for 78 percent of projects. The development of new materials remains virtually unexplored by SENAI.

- The SENAI survey revealed that only 40 percent of the operating units "always" or "frequently" respond to corporate R&D requests. In the remaining cases, requests from the companies are either "not met" or "occasionally met." This suggests repressed demand for research activities. Furthermore, 73 percent of the operating units anticipate that demand for applied research will rise over the next few years, which suggests that if the supply of technology-based services is not expanded, repressed demands will build up even more.

## *R&D Management*

Research teams consist largely of people who work simultaneously with vocational training, technical assistance and information technology. In only 7 percent of the cases studied are staff assigned solely to R&D activities. In 22 percent of cases, only the manager or coordinator in charge is permanent, with the remainder of the team called in according to the type of project. For the other cases, the

entire team, including the manager, is allocated on an ad hoc basis, depending on the nature of the demand. The manner of allocating staff takes into account criteria such as experience, affinity and available time.

The practice of outsourcing resources for R&D projects is used very little, with 42 percent of units never contracting out and 34 percent doing so only occasionally. Undertaking research projects in house builds capacity, but it also limits the service ability of the unit, making it too dependent on the availability of its own staff, who can become overloaded with work.

The survey also found that almost no incentives are available to encourage the involvement of technical staff in research activities. Only one unit offered bonuses and higher pay by selling projects to its participants.

### *Sources of Information and Funding*

R&D by SENAI units primarily uses in-house sources of information and technology. The main resource is use of the institution's laboratories, followed by consulting its libraries, research on the Internet, and informal contacts with researchers.

The least used resources are consulting public libraries, consulting patent databases, accessing company equipment, and using laboratories of other institutions. These results reveal that SENAI units tend to look more inward than outward, which limits their access to new technologies. This perception is confirmed by the fact that almost all the units wanted more investment in information technology resources, human resources, facilities, laboratories, bibliographical references and the databases at the institution itself.

The manufacturers of equipment and feedstock are significant sources of information and technology for some units. Acting as an agent disseminating new technologies, SENAI is consequently of interest to industry, which offers equipment at discount prices, provides training, and supplies ample technical information about its products.

With regard to the funding sources for R&D, there is a preponderance of in-house financing. Particularly noteworthy is the number of units that do not charge for the projects developed. However, this practice is adopted mainly by units that are starting up their R&D activities, or that undertake projects at their own initiative.

The units that charge for services generally recover only the costs of the technology transfer activities. The calculation of the service cost includes only the technical service hours rendered, use of the equipment, travel expenses and overhead. It should be recalled that SENAI is an entity that is underwritten by contributions from industry equivalent to 1 percent of the payroll of each company. Consequently, its customers feel that they have the right to the results of all the products and services offered by the institution, including research, agreeing to pay only for the variable costs inherent to the technology transfer process.

In addition to in-house funding and charging for its services, 63 percent of the operating units turn to outside sources to finance R&D. The main sources are the Studies and Projects Financing Agency (19 percent), the Brazilian Small Business Bureau (19 percent), the National Scientific and Technological Development Council (15 percent), the Support Program for Scientific and Technological Development (13 percent), and state entities (Research Support Foundations). A practice that is not widely used but warrants attention due to its growth potential is the risk contract, under which the unit and the customer share responsibility for products and process development.

### *Disseminating Results and Interacting with Other Units*

R&D activities are vital for generating knowledge. By seeking solutions to the problems posed by the subjects being researched, the human resources involved in the process find opportunities to expand their qualifications and develop new skills. At the teaching institutions, R&D tends to trigger a virtuous circle that associates the generation of know-how with upgrading the quality of the training process itself, insofar as teaching staff and students can rebuild their own expertise through experiments, testing hypotheses, reformulating concepts and assessing new procedures. However, effective dissemination of knowledge requires the involvement of different areas, documentation and disclosure of results, and interaction with the end-users in order to obtain the feedback required to fine-tune the product or process. In the specialized literature, these processes are known as “learning through use” and “learning through interaction.” This latter concept—developed by Lundvall (1988)—stresses a collective apprenticeship based on a cooperation process among different economic agents.

The survey found that 68 percent of the units adopt documentation policies or methodologies that are defined and standardized by the in-house assessment system. Analysis of projects developed from 1997 on found that 54 percent of them were backed by exhaustive documentation. Even those units lacking well-defined documentation policies strove to record the progress of the work, however partially or incompletely.

In most cases (69 percent), the results and conclusions of R&D projects are transferred to the teaching staff. This also takes place with technical assistance and technology information activities. In 84 percent of cases, the results of the surveys help provide leverage for other activities. The fact that professional staffers assigned to other areas also take part in the research activities streamlines the cross-fertilization process, making the generation and transfer of know-how more dynamic.

With regard to the schooling levels of R&D staff, 24 percent were found to have graduate degrees (Masters and/or PhDs) and 41 percent university degrees. At 39 percent of the operating units, students take part in the applied research activities. Although not a majority, this percentage may be considered significant, as there are certain constraints—at times imposed by law—on the participation of students in research activities, due to contract confidentiality or limited access to accredited laboratories.

There is a high level of participation in R&D teams (in 81 percent of units) by the employees of clients. This positive finding reflects cooperation in technology transfers between SENAI and industry, benefiting not only the companies but also SENAI itself, which gains access to the tacit know-how of professionals working in industry.

### ***Effort and Performance Indicators***

R&D effort and performance indicators have yet to be formally defined at SENAI. The systematic collection and analysis of these indicators would allow for an objective assessment of the investments and results of R&D activities. At the moment, most units do not record their investments and revenues based on research activities separately in their accounts, instead entering them under the same revenue headings as those brought in through rendering other technical services. This procedure blurs a clearer understanding of these actions as specific

product lines (or lines of business) and hampers any assessment of the cost/benefit of each activity. However, 11 operating units have already established a specific pricing policy for R&D projects, and 10 enter the revenues brought in through these projects in their accounts under separate headings from their other activities.

Performance indicators analyzed in the survey show that the R&D projects carried out at SENAI from 1997 through 1999 resulted in the registration of 15 patents. This is a relatively high figure in Brazil, which does not have a patent “culture.” Other indicators are the publication of 49 articles and monographs based on applied research, a rate of one article for each six projects carried out. Presentation of the results of the research projects at fairs, seminars and congresses was the most widely used method of dissemination. Since 1997, SENAI has participated in 84 technical and scientific events, some of them international, a rate of one presentation for every three projects.

### *Strengths and Weaknesses*

Prospects for growth of R&D are greatly shaped by the awareness of operating units of their strengths and weaknesses, as well as threats and opportunities.

The survey reveals that levels of awareness of these matters vary widely among the units, depending on such factors as geographical location, the sector of economic activity to which they are assigned, the skill profiles of their human resources, their management mechanisms, and their experience with R&D projects.

In most cases, human resources are rated as a positive point in terms of qualifications, skills, experience, commitment, motivation, creativity, multifunctionality, multidisciplinary and institutional incentives to upgrade skills. When the aspects related to the availability of human resources are assessed, the same proportion of units felt that this was a weak point, due to work overloads, build-up of tasks and limited staff.

When looking at the physical and information infrastructure, heterogeneity prevails. Some operating units have modern, up-to-date equipment and laboratories, well-equipped workshops, easy access to databases and libraries, and an adequate permanent reference collection (factors rated as strong points). In contrast, others struggle with obsolescent or even non-existent laboratories, equipment or tools, and with out-of-date reference collections.

In terms of competitive positioning, the units felt that the main strong points were the ease with which SENAI maintains good relationships with industry, its capillarity (operating nationwide), and its physical proximity to and presence in many different industrial sectors. Its weak points included high project costs, the lack of tradition and know-how at SENAI for research activities, project development lead times (rated as very long), and the lack of specific methodologies or policies for this area.

Other strong points that appeared less frequently were the aggregation of different areas of knowledge in a single unit, the quality of its services, management support, a cooperative organizational climate, the public image of the SENAI brand name, and its institutional capacity to build up alliances and partnerships with universities and research centers.

The weak points that appeared less frequently included difficulties in obtaining financing, low rates of return on projects, an inadequate job and wage plan, and the lack of a marketing policy for these activities.

## Impact on Companies

The survey carried out with the SENAI operating units was supplemented by an analysis of the institution's impact on the companies signing up for its research services. This resulted in the report entitled "Applied Research at SENAI: Mapping and Assessment of Impacts on Companies" (*A Pesquisa Aplicada no Senai: Mapeamento e Avaliação dos Impactos nas Empresas*). This second phase of the survey compared supply with demand for research projects, including views from users. The survey also identified potential demand among companies in order to provide input for defining strategies by SENAI. The findings were supplemented by a case study that involved visits to SENAI customers and its technology supplier.

Carried out from August through October 2000, the survey was based on a structured questionnaire, answered by 50 companies. Classified by revenues, 34 percent of the companies are large (revenues of over R\$ 50 million) and a similar proportion are micro and small enterprises (revenues of up to R\$ 5 million). Medium-sized firms accounted for the remainder of the sample. With regard to access to R&D carried out by SENAI, there are no marked differences by size or revenue.



Over half of the companies are exporters, although most of them direct less than 10 percent of their sales abroad, with 44 percent assigning all their output to the domestic market. In terms of location, most of the companies surveyed are headquartered in São Paulo (40 percent), reflecting the state's weight in Brazil's industrial output. The sectoral distribution is relatively heterogeneous, with some notable areas including chemicals, textiles, rubber and plastic, hides and leather goods, travel items and footwear.

### *Reasons for Close Relations and Assessment of SENAI Performance*

Backed by a lengthy track record of close relationships with industry, SENAI is famed for the capacities and competencies of its human resources, in addition to the availability of its laboratory infrastructure and equipment. Most of the companies consulted mentioned earlier experiences with SENAI with technical assistance and education prior to signing up for R&D services.

The quality of SENAI services was assessed on the basis of four criteria: capacity and competency of human resources, project development lead time, price, and the quality of the results.

When looking at the capacity and competency of the human resources involved in project development, there is almost unanimous acknowledgement that SENAI is well endowed to carry out the proposed activities: 90 percent of the valid replies rated their expectations in this field as being fully met, with only 10 percent rated as fair.

This assessment also corroborates the positive assessment of the SENAI units themselves.

A similar level of replies is noted for the quality of the results obtained, with 77 percent of companies reporting that they were fully satisfied. The quality of the results takes into account the overall institutional performance, together with the fact that a specific demand was met in full.

However, when looking at aspects related to prices and lead times, the views of the companies begin to differ. For the price item, although most (60 percent) of the companies demonstrated satisfaction, a higher proportion assessed the performance of SENAI as only fair (26 percent). However, this assessment might well be associated with the fact that the companies already pay their dues to SENAI, feeling they have the right to its services free of charge, or at most paying only token fees.



When looking at the item on development lead time, 57 percent of the companies were fully satisfied with the length of time it took to develop the project, while the number of those who were poorly satisfied or not satisfied rose to 10 percent. Due to the lack of earlier data for comparison purposes, it is not possible to state whether the performance of the institution has been worsening or improving. However, this configuration indicates the need to fine-tune resources and upgrade processes in order to provide services that are better tailored to corporate needs in terms of lead times.

### ***Project Benefits and Impacts***

The assessment of the benefits from R&D activities contracted by companies with SENAI is based on a set of quantitative and qualitative indicators. The results highlight the role of R&D in boosting the conformity and reliability rates of the products in question, which was mentioned by almost 50 percent of the companies. Other highlighted benefits were better global competitive positioning (mentioned by 34 percent of respondents) and lower production costs and new product lines (30 percent each). These results are obviously shaped by the type of survey carried out.

The qualitative aspects can be grouped into three categories. The first covers companies that managed to identify the impact of R&D projects, even if they were unable to quantify them. This category constituted the majority, with 36 cases. The descriptions of these impacts vary widely, and they are frequently confused with the benefits. The second category includes five companies that have not yet seen the impact, either because their projects are still in the implementation stage, or because they have not yet had sufficient time to mature. The third category covers those companies affirming explicitly that the projects had no effect whatsoever. There were only four such cases, and two were due to the fact that the projects have not been implemented. Some examples of the replies illustrating the benefits were a 30 percent reduction in product costs; a cost reduction estimated at \$100,000 a year; fewer losses and lower costs; lower logistics costs; lower production process losses; a 10 percent increase in sales only 12 months after the project was implemented; and higher productivity, better services and faster order handling.

There are also indirect indications that the projects ushered in greater adaptability, credibility and trust in the products in question. Comments suggest-

ing this conclusion included the following: “the product now complies with technical standards, keeping it in step with rising market demands;” “the project endowed the product and the company with greater credibility;” “lower rejection rates with higher customer approval ratings;” and “fewer customer complaints.”

Social and environmental impacts were also notable, as reflected in the following replies: “higher income for producers;” “lighter environmental impacts;” “water savings;” and “development of a new application for the product linked to the environment, providing leverage for sales and upgrading the technological marketing of the company.”

Finally, impacts on the launch of new products were also identified, together with product diversification and bringing in new customers.

These perceptions of project benefits are essentially qualitative. Quantifying these benefits is a far more difficult task, as the companies lack the necessary tools for this type of assessment. Indicators such as lower costs and higher sales are hard to isolate and associate with specific projects. The replies were not very accurate, but they did indicate some results. For example, 11 companies affirmed that the research projects directly contributed to higher sales, with increases varying from 1 percent to 60 percent, mainly among micro and small enterprises.

With regard to cutting production costs, 14 companies identified project impacts. Eight of them reported an increase in sales that paralleled their lower production costs. One company indicated a 70 percent cut in costs, while three others mentioned production cost reductions of 20 percent to 30 percent. The others estimated this benefit under 20 percent. Once again, it was the micro and small businesses (eight cases) that were more easily able to assess impacts, perhaps because they work with single products, or perceive the results more directly due to their small production scales.

### *Use of Tax Incentives and Financing for R&D Activities*

The main incentive open to Brazil’s industrial sector is the Industrial Technology Development Program (PDTI - *Programa de Desenvolvimento Tecnológico Industrial*) which is regulated by Law No. 8,661/93. This program grants tax benefits for building up the technological capacity of businesses that invest in R&D focused on software production technology, without this being their core activity. The law

also allows companies to enter into associations with universities, research institutions and other enterprises. The incentive consists of deducting R&D expenses up to a ceiling of 8 percent of the amount of the income tax due. It also offers tax exemption on industrialized products, and rapid depreciation of equipment allocated to R&D.

However, the PDTI incentives were trimmed to 4 percent of the income tax in 1997, and they now compete with employee benefits such as the Meal and Transportation Vouchers Program (PAT) (*Programa de Alimentação do Trabalhador e Vale Transporte*). In practice, the deductions under the PAT almost reach the 4 percent ceiling, wiping out the possibility of deducting expenses on technology. Consequently, the benefits offered by the tax incentive act for developing programs for industry and agribusiness are virtually negligible, due to the constraints on the scope of the mechanisms available, tied by tax adjustment measures.

There are several programs that underwrite professional capacity-building and support technology development in companies, run mainly under the aegis of the Ministry of Science and Technology. However, most of the companies analyzed (44 percent) were unaware of such programs. This lack of knowledge is naturally more marked among microenterprises. A significant percentage of companies (24 percent), mainly in the medium size range, were aware of the programs but do not use them. The reasons given include complex paperwork and red-tape, lack of confidence about the market situation, and lack of disclosure in other areas of the business. Only 26 percent of companies use these incentives and programs.

Looking at institutions that finance research—the National Science and Technology Development Council, the National Economic and Social Development Bank, the Studies and Projects Financing Agency, and the São Paulo, Rio de Janeiro and Minas Gerais Research Support Funds, among others—36 percent of companies use official lines of credit for technology, particularly larger businesses, amongst whom this level of use reaches 70 percent. The level of unawareness is only 28 percent. However, the fact that companies know about these sources does not necessarily mean that they will use them more, as was the case with 32 percent of firms. This shows a lack of information about lines of credit, as well as the difficulty in dealing with the procedures needed to release the funds. Other possibilities are the lack of formalization of technology-based activities in

the companies, which hampers their transformation into projects that qualify for financing, and the fact that the existing incentive mechanisms are not tailored to their needs.

Notable among the R&D support programs that could be used by SENAI and its partners in industry are:

- Human Resources for Strategic Areas (RHAE - *Recursos Humanos para Areas Estratégicas*), which offers study grants to train researchers, engineers and technicians at the technical college level. This program is already being used by at least one National Technology Center, which hired researchers on a temporary basis for a specific project.
- Alfa Project, whose purpose is to encourage technological innovation in micro and small industries through a sinking fund that underwrites the technical and economic feasibility studies that constitute the initial phase of the technology innovation process.
- Omega Project, whose purpose is to encourage cooperative research projects headed up by public or private research centers, universities or technology institutes, and which are backed by at least two companies established in Brazil and not belonging to the same control group. This project is well adapted to the SENAI units running projects for companies in a single sector, as well as multi-sector theme projects.
- Technology Management for Competitiveness Program (*Programa de Gestão Tecnológica para a Competitividade*), which supports capacity-building initiatives for R&D management;
- Tax incentives for the information technology and automation areas (Law No. 8,248/91).
- SOFTEX 2000 – Export Software Support Program (*Programa de Apoio ao Software para Exportação*), which finances the business plans of enterprises in this sector.
- Technology Support Program for Micro and Small Businesses (PATME - *Programa de Apoio Tecnológico às Micro e Pequenas Empresas*), which focuses on the many different technology-based activities of small-scale businesses.

SENAI is in fact in a favorable position for obtaining these funds, as its R&D activities qualify for several different lines of financing. Another role that SENAI could take on is to act as a catalyst through joint projects with companies and other research institutions. Disseminating programs among its members through seminars and technical support in project preparation could also prove useful in promoting these incentives as an additional source of funding for R&D activities, particularly among smaller companies.

The future of financing technology-based activities in Brazil lies in the sectoral funds. A government project makes provision for setting up a group of funds intended to encourage and rebuild the research capacity of the public and private sectors. It is estimated that from 2001-2005, these funds will invest a total of R\$ 7.29 billion in science and technology. However, of the 10 funds planned, only one is actually in operation: CTPetro, which is backed by royalties brought in through oil and natural gas production. The remaining funds are still at different structuring phases, with most still awaiting approval by the Brazilian Congress.

The two phases of this survey revealed results that are important for R&D by SENAI and its impacts on teaching activities and relationships with industry. Many of SENAI's more than 300 projects could be transferred to industry, identified through cross-referencing the questionnaires answered by the suppliers and users of different technologies.

Heralded as one of the great educational innovations of the 20th century, community colleges have played a crucial role in expanding and democratizing post-secondary education. In the United States and Europe, one- and two-year education and training programs now absorb at least half of all high school graduates.

*Community Colleges: A Model for Latin America?* explores how these institutions can help address the very challenges faced by post-secondary education in the region: an expanding and heterogeneous clientele, a lack of alternative social mobility options for people unable to attend traditional universities, and the need for more relevant curriculum that emphasizes knowledge and skills better attuned to the needs of the job market. The book aims to foster the development of effective community college models in Latin America by discussing the issues and obstacles from the North American experience in terms of financing, accreditation, prestige, and a regulatory and incentive framework.

Latin America is far behind Europe and the United States in developing diverse, quality programs for its growing post-secondary population, which includes many people previously excluded from higher education. Schools that offer one- and two-year programs generally serve the least affluent and politically influential groups, so they often are short-changed in the allocation of funds. Yet, as demand for these programs grows, educators and ministries are left grappling to find new teaching methods, identify new markets for graduates, and better match students with real labor market demand. The community college model may be a source of inspiration for Latin America's efforts to reach out to this new educational clientele.

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