Educating the labor force of Ibero-America

Part 14
Ibero-American integration

By the year 2000, 100 million new jobs will be created in Ibero-America, in which workers will be trained to be skilled in the production of capital goods. By 2015, the continent will be an economic superpower, whose production and productivity will equal the level attained by the industrialized coun-

This installment continues Chapter 5 of the Schiller Institute's book *Ibero-American Integration: 100 Million New Jobs by the Year 2000!* published in September 1986 in Spanish, and appearing exclusively in English in *EIR*'s serialization. An international team of experts prepared this study on the urgent measures needed to free Ibero-America of its economic dependency and spark a true, worldwide economic recovery, elaborating the outline of Lyndon LaRouche's 1982 proposal, "Operation Juarez."

Numbering of figures and tables follows that of the book.

While it is true that Ibero-America has its share of natural resources, both biological and mineral, it is a delusion to see in these resources per se a source of wealth. In fact, misplaced focus on natural resources is partly responsible for the very underdevelopment the continent now experiences, with petroleum and mining relatively well developed, surrounded by a sea of industrial underdevelopment. By contrast, Japan, with virtually no natural resources of any kind, has become the third-greatest economy in the world. Japan has done this by concentrating on the development of labor power, by rapidly increasing its general education and skill level.

For Ibero-America as for all modern economies, this task comprises two aspects: the baseline level of literacy and general education of the majority of the work force, and the number and quality of training of scientists, engineers, and technicians. Contrary to Maoist and other "anti-elitist" theories, it is this last feature which is the most critical: It ultimately determines the rate of technological advance of an economy.

Several examples from the past half-century help to make the point clearly. The United States recovered from the worst depression in its history after 1939, to previously unimagined levels of heavy capital goods production for war in four years, only because there was a reserve of unemployed and underemployed skilled labor created over the previous 40 years of development. Postwar Japan recovered the way it did after World War II only because of pre-war levels of skilled and educated workers. Both South Korea and Taiwan instituted very rigorous programs for universal education from the early 1950s, without which their respective "economic miracles" could not have happened.

TABLE 5-3

Number of high school and university students in Ibero-America 1982-83

Level of education	Age Group	Population in this group (millions)	Number of enrolled (millions)	As % of their group
High School:				
10th-12th grades	15–17	26.7	10.2	38.0
University:				
1st-2nd years	18–19	16.7	2.9	17.5
3rd-4th years	20–21	15.8	1.5	9.4
All four years	18–21	32.6	4.4	13.6
Postgraduate	22–24	22.3	0.6	2.5

Sources: UNESCO, ECLA and our own estimates.

TABLE 5-4

Enrolled in natural science and engineering in the universities of various countries 1983

(per million inhabitants)

	Natural Sciences: Students	Natural Sciences: Graduates	Engineering Students	Engineering Graduates
Argentina	758	n.d.	2.340	n.d.
Brazil	528	63	1.228	179
Colombia	208	25	3.159	256
Chile	741	73	3.016	279
Mexico	323	29	3.429	318
Peru	557	10	3.085	51
Venezuela	391	16	3.787	245
West Germany	1.693	121	3.549	321
South Korea	1.170	153	6.943	1.426
United States	n.a.	381	n.a.	433
Japan	n.a.	n.a.	3.367	782

n.a. = Data not available.
Source: UNESCO.

In contrast, education in Ibero-America, despite genuine progress in the last 30 years, especially at the primary and secondary levels, is far below what it must become by 2000 and 2015 to realize the investment and growth program we have outlined. Official figures as compiled by Unesco based on country data show a picture in which school attendance through the first six years is effectively universal in most Ibero-American countries, and is supposedly nearly universal through the first three years of secondary school. However, due to very high rates of repeating grade levels in most countries, the actual number of students completing three years of secondary school is undoubtedly very much below 100%. The major problems in these grade levels are:

- excessively large classroom size in many countries;
- inadequate training of teachers;
- antiquated teaching materials, especially for the all-important area of science education; and
- and the overall conditions of poverty in which the students live, making classroom concentration, and at-home study, very difficult.

But it is at the higher levels that the more serious problems appear. The Unesco figures suggest that in 1983, at most 38% of the children between the ages of 15 and 17, the age for high school, actually attended school. Forty-nine percent of 15-year-olds attended school, but only 28% of 17-year-olds, which means that at most 28% of the youth graduated from high school. This is a terrible percentage, and means that the vast majority of even the younger adult population lack an adequate high school education—and the older adult age brackets obviously contain yet far fewer high school graduates. Such a basic high school education is the minimum needed to handle a skilled blue-collar job in a modern, industrial economy.

At the college/university level the deficiency is even more acute. Only 13.6% of the 18-21 age bracket is in school in Ibero-America, the majority of these only for one or two years; and post-graduate education involves only 2.5% of the 22-24 age bracket. **Table 5-3** shows the estimated school-age population, school attendence and percentage rate, for the 15-24 age brackets, for Ibero-America in 1982-83.

Even more serious is the distribution of disciplines of Ibero-America's university students and the relative percentages of those who complete a four-year course of study and graduate. **Table 5-4** shows relatively few students of the natural sciences and of engineering in Ibero-America, compared to South Korea and West Germany, measured in numbers of students graduating in this field per million population of the country, and number per million graduating.

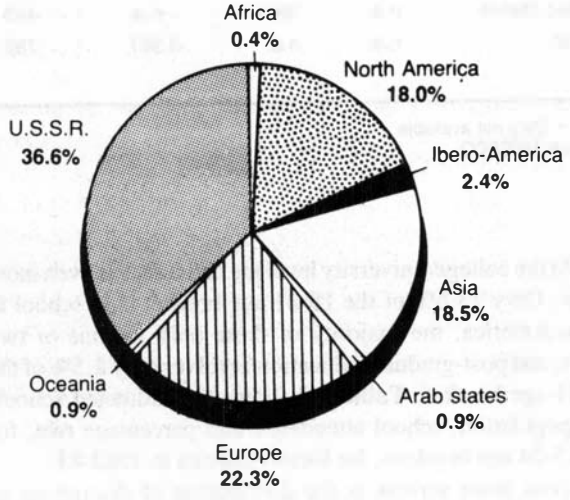
As can be seen, Argentina and Brazil have the best record in Ibero-America in training natural scientists, but their levels are still about half those of South Korea and West Germany, while the numbers of *graduates* in these fields is abysmal. And while most countries have many engineers in school, again, the number that graduates is very low. Peru's case deserves note for having by far the poorest ratio of students who graduate, in the two disciplines listed above and across the board. Of particular note is that Mexico is weak in the natural sciences even compared with the rest of Ibero-America. Mexico's Consejo Nacional de Ciencia y Tecnología reported that in 1975, Mexico had a mere 210 students enrolled in masters' programs in physics and only 14 in doctorates; 149 and 6, respectively, in chemistry; 185 and 49,

respectively, in biology; and 149 and 11, respectively, in mathematics. While it may have improved somewhat in the last decade, it can be assumed that not only in Mexico, but throughout the continent, the situation at the post-graduate level reflects the poor rate at which graduates of four-year programs are turned out.

Most telling of all is the failing in the area of research and development. **Figure 5-13** shows Ibero-America's relative number of scientists in, and expenditures for, research and development, compared to the rest of the world. The figures speak for themselves.

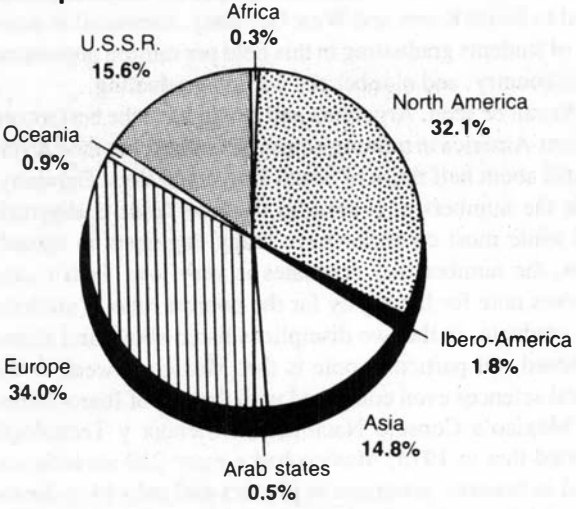
FIGURE 5-13

Scientists and engineers in research and development 1980



Total = 3,756,100

Expenditures in research and development 1980

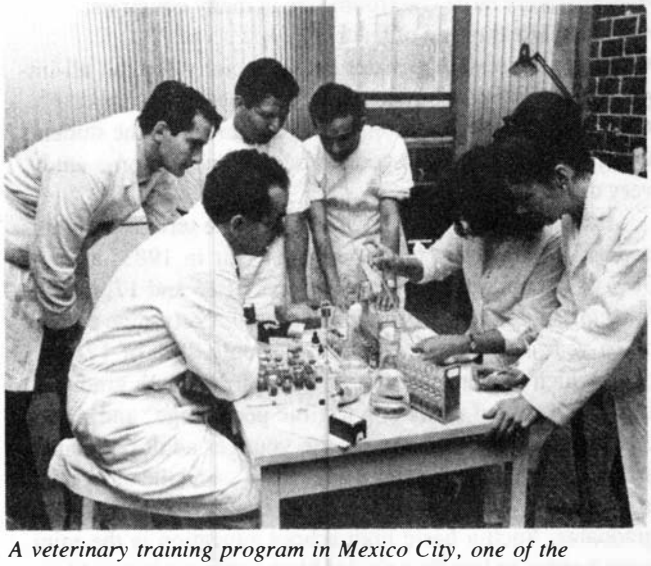


Total = 207,801 million dollars

Clearly, it will be impossible for Ibero-America to achieve the development goals elaborated earlier in this chapter, which entail attaining West European levels of overall development by employing technologies at the upper range of sophistication, including many not yet fully developed, without closing the enormous research and development gap indicated in Figure 5-13.

To achieve these development goals necessitates a crash program of education at all levels. First, it entails upgrading the quality of education at the primary and secondary levels, and returning to a classical curriculum modeled on the famous Humboldt reform in 19th-century Germany. And it means ensuring that by the year 2015, almost every child of the appropriate school age graduates at age 18 with 12 years of basic education. Second, it entails raising substantially the percentage of youth going on to 2-4 years of higher education. Third, it requires ensuring that the preponderance of those going on to higher education specialize in education, medicine, natural science, mathematics, engineering, and agronomy, to the almost complete exclusion of relatively useless categories such as sociology, humanities, business administration, law, and so on, which today prevail in our universities.

Tables 5-5 and **5-6** project estimates for needed attendance for age groups 15-24 for 2000 and 2015. The projections assume that in 2015, 100% of enrolled students finish at least four years (up to age 16), and 90% graduate from secondary school; that 40% also complete at least two years of college or its equivalent (trade school, normal school, etc.); that 25% complete a full four years, with 15% completing five, and 10% completing seven or more years of higher education. Targets for 2000 represent a partial attainment of these levels (75% graduation from secondary school, 35% completing two years of college, 20% completing four



United Nations

A veterinary training program in Mexico City, one of the scientific-technical fields where Ibero-America must vastly increase the number of students in higher education.

TABLE 5-5

Projection of number of high-school and university students in Ibero-America Year 2000

Level of education	Age group	Population in this group (millions)	Number of enrolled (millions)	As % of their group
High School:				
10th-12th grades	15–17	37.9	30.7	81.8
University:				
1st-2nd years	18–19	23.5	8.8	37.5
3rd-4th years	20–21	22.6	5.1	22.5
All four years	18–21	46.1	13.9	30.2
Postgraduate	22–24	31.8	2.2	6.7

TABLE 5-6

Projection of number of high-school and university students in Ibero-America Year 2015

Level of education	Age group	Population in this group (millions)	Number of enrolled (millions)	As % of their group
High School:				
10th-12th grades	15–17	52.9	50.3	95.1
University:				
1st-2nd years	18–19	33.1	14.9	45.1
3rd-4th years	20–21	32.3	8.9	27.5
All four years	18–21	65.3	23.8	36.4
Postgraduate	22–24	45.5	5.3	11.7

years, and 5% going on for two or more additional years). Attaining these targets, assuming sufficient emphasis on the indicated quality of education and disciplines, will largely close the trained manpower gap now experienced by the continent.

Training this number of students will involve an enormous investment, in new schools and universities, in teacher training, and in equipment, especially laboratory and related equipment for science and technical education. Including figures for the additional students who will need school facilities in the 6-14 age bracket as well, **Table 5-7** gives the total number of additional students who must be provided education, compared to today's level (see Table 5-4, above), in 2000 and 2015.

It should be obvious that supplying this number of students with quality educational facilities and instruction is going to be quite costly, and must be understood as an investment in development no less essential than that for energy, infrastructure, or capital goods. Without it, the investment in physical capital cannot be effectively utilized; without it, the necessary ever-increasing levels of productivity will not take place, and the entire program will collapse.

TABLE 5-7

Increase in student population 1985-2015

(millions)

Level of education	Age group	Enrolled in 1985	Increase 1985-2000	Increase 2000-2015	Increase 1985-2015	Total in 2015
Primary	6–11	60.1	23.2	32.2	55.4	115.5
High school:						
7th-9th grades	12–14	27.5	10.6	14.7	25.4	52.9
10th-12th grades	15–17	10.2	20.6	29.7	40.1	50.3
All six years	12–17	37.7	31.2	44.4	65.5	103.2
University:						
1st-2nd years	18–19	2.9	5.9	6.1	12.0	14.9
3rd-4th years	20–21	1.5	3.6	3.8	7.4	8.8
All four years	18–21	4.4	9.5	9.9	19.4	23.8
Postgraduate	22–24	0.6	1.6	3.2	4.8	5.3