

The Correlation between Industry, Development and Education

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BUSINESS AND EDUCATION OR EDUCATION AND BUSINESS

I had a question: Is education the engine driving development? Or does it drive the development of business, and is then the stability of business driving productive education? The correlation between business, development, and education deserves greater attention.

What do we mean by business?

The industrial business sector in Argentina encompasses some 130,000 companies and employs some 1,400,000 people. We shall confine ourselves to examining the 67,000 companies or so employing over 25 people and which, when taken together, have a workforce of approximately 900,000 employees.

In this segment, the entrepreneur is still the driving force of the company. What is an entrepreneur, besides the classic definition of their role as the catalyst of capital, technology, and labor? According to an old German, almost Nietzschean definition, the entrepreneur is the only one able to add something more to the company than mere profitability, the desire for power or the desire for prominence: it is their passion and love for the thing itself.

In the United States, out of 12,000,000 companies, there are 1,000 producing 50% of GDP, and the other 11,999,000 produce the remaining 50%. At this point, once such a dimension has been reached, the engine driving the company is no longer the entrepreneur but the administrator, with all the attendant problems.

Education and human development

Education affects human development in a range of cultural and sociological aspects, as well as quality of life and economic development.

Economic development is only one of the purposes of education: in fact, there were times when it was believed that economic aims corrupted other educational goals. Accordingly, the purposes of productive education have been called into question by different schools of thought, alongside a criticism of the sociology of business itself.

De Tocqueville believed that the pyramidal structure of the company represented the greatest threat to democracy. He believed that man degrades to the same extent that the worker perfects.

Marx reached the same conclusion coming from another direction, as he said that the devaluation of the human world grows in direct proportion to the valorization of the world of things.

Others also expressed their concern upon comprehending how far workers' organizations could penetrate in the political, social and economic functioning of the country.

It seems that the latest series of dramatic events in the industrialized world—the fall of the Russian system, of the Berlin Wall, etc.—have favored the expectations of the industrialized

world as regards economic development and individual freedoms, leaving the pursuit of other human goals to a pre-industrial world. .

But for now, I will put my concerns aside and talk about education in relation to economic development.

Which education for economic development?

The first answer could be -and it is after all the most popular in our current context- higher education, scientific education, and elitist technological education.

Without Nobel Prizes, there can be no development. This answer solves the chicken and egg dilemma, as it affirms that higher education is the main engine driving economic development. Historical confirmation of this tenet may be found in the initial success seen in the United States, largely due to the fact that the abundance of natural resources was accompanied by the first system of compulsory schooling and the first system of mass education.

Today, technology is sold freely on the market and the greatest contribution made to economic development comes from its widespread application, as demonstrated by the development of Japan, Korea and now the entire Asian continent.

However, this is not a modern answer. Knowledge has been externalized and today, knowledge is a product that can be acquired. Both teacher and student in principle share the same capacity to access information; what varies is their ability to use it.

Education in Western countries tends to provide (university) training for the top 25% of the population. This is the source of the greatest scientific and technological results that have contributed to the economic development of industrialized countries. But today, technology is sold on the market and the greatest contribution to economic development arises from its widespread application, as demonstrated by the development of countries such as Japan, Korea and now the entire Asian continent. The nature of the change can be seen in the three top products in terms of mass consumption: video cameras, faxes (an American invention), and compact discs (The Netherlands). All three are Japanese products: he who manufactures the cheap product takes the product away from its inventor.

In Japan, and today in Asia, most educational efforts are not concentrated in the upper 25%, but in the lower 50% of the productive complex. Some cynics have said that the impressive growth of large Japanese companies arises precisely from the fact that they employ very few MBAs compared to the prevalence of these in our world.

How are we reacting? At MIT, where I received my PhD in Process Metallurgy, there are no more American students dedicating themselves to this kind of productive work: only Chinese, Pakistani, etc. At the MIT Club in Buenos Aires, I recently met three Argentines, recent graduates from MIT: all three were from the Sloan Institute, meaning that they'd taken MBA courses.

We offer two annual postgraduate scholarships (USD 25,000 per year each) in the Process Metallurgy Sector of the Materials Science Department.

In the past, livestock farmers were the ones who tended to invent new products (for instance, in Great Britain and the USA). However, in these times, competitive advantages are more likely to emerge from new process technology than from new product technology.

Americans spend 2/3 of their money on new products and 1/3 on new processes. The Japanese do the opposite: 2/3 on new processes and 1/3 on new products.

The Germans and Japanese focused on process technology because the American concentration on product technology was so much more advanced that it left no room for them. They were better able to compete in those spaces left empty by the Americans.

Nonetheless, what was a good American strategy 30 years ago is no longer working today.

What education should we then pursue? That of the top 25%, as advertised in our environments? Or the bottom 50%, which presents itself as the most confusing image in our assessments?

That aimed at achieving the highest standard of technological and scientific development? Or that designed for the professional training of technology operators? Production education or service education?

Perhaps we may find an answer in the consideration of what is desirable versus what is possible. The Japanese response seems the most advisable for a developing country, but it is the most difficult in our cultural context: elitist, conflictive and ineffective. (*Clarín* newspaper, August 21: "It is worth asking how these developments should be incorporated into an industrial apparatus that was dismantled in the '70s and has not yet managed to recover from this atrophy.").

To achieve industrial technological transformation, a scalable industry and an industrial vision are necessary, as are an industrial policy and a profound change in the productive culture of the Argentine ruling classes.

Human resources: the difficulty of change

The CEOs of the top Fortune 500 companies come from the following backgrounds: 34% marketing; 25% finance; 24% management and only 4% from production. It is very difficult to change this, because it would mean catapulting a second-class activity (production) into a first-class one.

If process technology is at the heart of the production equation, it is necessary to have executive heads who understand process technology. It stands to reason that the greatest competitive activity in society cannot be locked away in a black box while the CEO needs advisors to understand it. Notice that 70% of Japanese and European CEOs have a technical background compared to 30% of Americans.

In the future, there will be high-tech products and low-tech products, but the majority will be productive and employ high-tech processes.

If technology creates comparative advantage, harnessing this advantage requires an expert workforce from the top down. Brains may create new technologies, but the expert workforce will be the arms and legs needed to use them.

If the path to success lies through the invention of new products, educating the top 25% of human resources is critical. If the path to success passes through the ability to produce cheaper good of a higher quality, the education of the bottom 50% is then the critical variable.

This requires offices, factories and retail stores to employ an average of workers who have a level of education and skills that they lacked in the past. Each worker must have a higher mathematical education than any American high-school graduate.

If process technology is based on the use of human resources, the Human Resources director is the key man in the company. Just how far the Anglo-Saxons are from this concept can be seen in the order of access to the highest executive position. In all of American society, the second man, and the future first, is the chief financial officer. The director of Human Resources is a clever species who tends to be left in a corner.

In Japan, the director of Human Resources is not number two. Every top executive official must have gone through that function, sooner or later. American companies talk about large sums spent on professional employees and management, but they invest much less than the Japanese and Germans in the basic education of middle personnel which is so necessary for the absorption of future technologies.

In Germany, there is the intensive education of non-university personnel. At 15 years of age, a young person enters a dual school/industry educational system. After three years, they are promoted to the position of operator. With three years or more, after integrating management, legislation and technology courses, they will be awarded a master's degree, the minimum necessary to set up a personal company.

Germans are not the best educated when it comes to the upper echelons (Americans are better in this regard) or at the lowest level (here the Japanese are better), but they are the best in the world at intermediate, non-university level.

The cultural context of different countries

Economic purposes, productive purposes, and the search for social stability, are perhaps the main motivations driving business interest in the educational field. But another important motivation lies in the nation's own cultural context, what Germans call the *Volksgeist*.

The cultural context of the nation is a key part of a company's sociology. Think of the Japanese cultural context with its community ethic, or the German one with its nation ethic, or the Anglo-Saxon one with its Protestant business ethic, or the Catholic one with its individual ethic.

The Japanese, German or Anglo-Saxon cultural context has not been modified in any profound way by the introduction of the company as an entity, whereas the power context has changed radically. The influence on the pluralistic context of the Latin Americans has been different, as this has been exacerbated by internal struggles.

Economic-social vision is different in two key cultural contexts: that of the Anglo-Saxon world (the United States and Great Britain), and that of the Rhineland economies (Japan and Germany).

It is more competitive, flexible, short-term, and profitable for the individual in the Anglo-Saxon world. The company, with its need for quarterly stock market profitability, is a community of capital, resources, work, which are not tradable.

The educational problem focuses on personnel and their families, who on the whole enjoy relative stability in their employment. And this problem can be tackled with more determination and a greater sense of the future.

However, in my view, the Rhineland model is by far the most desirable and should be pursued in our country. Another point is that here, the concept of the company's stability tends to dominate, as do the concepts of the stability of the State and its policies.

The business/education balance in this context acquires a dominant aspect and appears as the vital motor driving modern economic development.

The role of the company: where to focus

1. It should try to convince the political-economic establishment of the government and other power centers of the strict correlation between industrial policy and development, and between development and education.
2. It should Intervene directly to promote educational development, either in technology training or in training operational personnel.
3. Special efforts should be made to work with children at primary schools, as well as technical schools (Campana Technical and Commercial schools), and provide scholarships for employee children.
4. Young professionals: Stanford MBA agreements.
5. The German system? Stability tends to fail.

Conclusions

We have considered the problem of education in general terms, looking at the development of man in the cultural, social and economic spheres as well as regarding quality of life. We have agreed to limit our consideration here to those aspects of education commensurate with economic progress, recognizing in this the apparent main motivation of the developed world. These have been my conclusions.

The cause/effect dilemma between education and economic progress is a false one, in that it forgets the role played by business as the main modern motor driving progress. The stability of business is the result of the stability of government policies.

The business/education balance has acquired, in this context, a dominant aspect, and presents itself as an essential driver for modern economic development. We have highlighted how productive application today offers greater competitive advantages than product innovation, and that this has shifted the focus of education from the top 25% to the bottom 50% of the active population.

The existence of a productive enterprise seems to be a necessary condition for this new education, taking into account that education is no longer a sufficient condition for the existence of the company. Without business, of course, there is no economic development.

The cultural context of nations presents itself as a way of determining the course of answers to this problem, and therefore defines who will have the greatest competitive advantage in today's world.

We have compared the different cultural contexts existing in the Anglo-Saxon world and the Rhineland world of Japan and Germany, and I have expressed my hope that the Rhineland model of Continental Europe, more sensitive to communities and their social content, yet less open to the risks of ravages of market disorder, is the best model for our country.

To bring about progress in technological education, however, a stable industry, an industrial vision of the country and an industrial policy are crucial: this means a sea change in the productive culture of the Argentine ruling classes.

Spain and Italy, in whose origins lies the Argentina of today, suffered and overcame the same problem, finally managing to achieve a degree of coexistence between the national cultural context and the concept of a culture of productive industry.