

## )Title) EDUCATION, WORK AND DEVELOPMENT

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### ABSTRACT

The article seeks to show the importance of education as a driver of a country's economic growth. Production processes are increasingly rooted in "intangible assets" (i.e. ideas). For a country to be successful, it is not simply a question of its citizens being "informed". Nations need to know how to use information and turn it into a productive asset. Technological changes are occurring at unprecedented speed. The same machines are used in most countries and are becoming increasingly affordable worldwide. What will mark the winners from the losers in the future is the ability to use this equipment efficiently. Good professional training is called for. It is indeed a strategic requirement. It is through quality education that people acquire the ability to reason, think and act. Brazil is seriously lagging behind in terms of basic and higher education. Improving the quality of teaching is absolutely crucial. The role of education in driving progress has never been clearer.

### KEY WORDS

**Labour market; Education; Productivity; Economic growth; Social progress.**

Just the other day my granddaughter asked:

- Grandpa, how old are you?

- Mariana, I'm from a time before jet airplanes. No television either. Way back, when there were no computers, faxes, Internet or email. Nobody had heard of cell phones.

She looked stupefied and said:

- Grandpa! You must be about 200 years old!

- Well no, Mariana, this has all happened over the past sixty years, and most of it in the last twenty. It just goes to show the amazing speed of change we are witnessing nowadays.

### **(Heading 1) The Speed of Change**

We live in an era in which history is quickly gathering pace. It is not the first

time that this has happened. Just think of the steam-driven looms invented by James Watt in 1763 and the invention of the electric motor by Werner von Siemens in 1886.

Every time history takes a leap forward, new skills are called for.

Look at what is happening today. New technologies are entering the world of work at unbelievable speed, opening up countless new opportunities. At the same time, this is creating much uncertainty in the educational system. Schools are being challenged to innovate and adjust to a pace that is out of synch with the slower, more traditional approach to learning.

In today's world of work, there is a growing demand for knowledge, flexibility and versatility. There is also an increasing call for people who can actually think rather than individuals whose heads are crammed with information.

The changes have been colossal. Alan Greenspan, former chairman of the Federal Reserve, wrote an interesting article showing that the GDP has a monetary and physical weight that together reflect the total weight of everything produced by a country. In his view, the GDP monetary value is expanding hugely while the physical weight component is decreasing. Over the past 50 years, America's GDP has quintupled in value (i.e.500%), while its physical weight has remained virtually constant. Also relevant is that 50 years ago, things such as radio sets and calculators were heavy. Nowadays, thanks to microchips, they are tiny, light and easy to carry. Even cars and planes are proportionally much lighter. Optical fibres have replaced tons of copper in transmission lines. Computerized online financial transactions make the use of tons of paper a thing of the past.<sup>1</sup>

What does all this have to do with education? Well, everything.

The phenomenon noted by Greenspan simply reveals that production is relying increasingly on intangible inputs. In other words, it depends vastly more on ideas and less on muscle and physical strength. Modern industrial production involves a more abstract than concrete approach. The 'abstract' approach is something that is learned in school. It follows that quality education has become a keystone of industrial production.

The ability to think is crucial to today's economy. Modern firms are looking to recruit and retain staff with a range of special attributes: common sense, logical reasoning, an ability to communicate, to continuously learn, to be prepared to work in groups and, of course, to know their own jobs inside out.

Using common sense is vital. The worker who puts defective parts or rotten apples at the bottom of the box in the hope that the customer will not notice is a perfect example of lack of common sense. It's bad for the firm, and it's bad for the worker himself. The latter fails to realize that the true 'owner' of his job is the customer. If the customer is dissatisfied, he will stop buying from the firm. The firm, in turn, will stop expanding and might not even survive.

This kind of common sense attitude doesn't call for complex knowledge --- simply the kind of common sense that comes with a good general education. The modern company expects its employees to show common sense, know their jobs, be committed to their work, and be enthusiastic in everything they do for the firm. All this is the result of education.

The labour market is increasingly demanding. Passing the entrance tests for

many companies is more difficult than succeeding in a university entrance examination. Manpower recruiters are looking for staff with a good command of basic knowledge as well as more specific expertise related to the job on offer. What does this really mean? Are employers seeking to employ a Descartes? Do applicants need to be generalists and specialists at the same time? Exactly! Modern companies expect their employees, in addition to being good at their chosen speciality, to have a command of their own language, of mathematics, of general knowledge, and above all, maintain respect for the work ethic.

Is not it enough to merely be 'trained'. It is necessary to be educated in the fullest sense of the word, because the meteoric speed of change makes it vital for workers to study and learn continuously. In other words, this is not simply about training but about education. A diploma is not enough. Workers need to possess the ability to learn. The modern firm is not just seeking people with paper qualifications. It demands appropriate responses from staff who are able and prepared to go on learning.

You may think that competition is ferocious today, but it is not as ferocious as we expect it to become in the coming years! In Brazil, we are sadly lagging behind in terms of competitiveness. Over recent years, the country has fallen from 32nd to 51st position out of a total of 60 countries surveyed by the Swiss IMD (2012).<sup>1</sup> When the various components of competitiveness are disaggregated, it becomes clear that our greatest weakness is the poor quality of our education.

Productive work calls for discipline, diligence, commitment, love of doing a job professionally and competently. All this depends on good quality education.

New technologies are transforming the way we work. And this is just the beginning of a remarkable revolution. Staff need to be highly versatile. The truth is that we have already entered the era of multifunctionality. Take for example the case of the humble secretary. In the past, all that was required of a secretary was good typing skills and some sense of organization. Today, a secretary needs to master constantly upgraded word processing techniques. She must be able to write cogently; know something about bookkeeping; help to control costs; make travel arrangements; handle sophisticated equipment such as copying machines, faxes and modems; deploy personal communication skills; and know foreign languages, while also possessing a host of other useful skills.

The new world of work will require people to study on an ongoing basis. Traditionally, economic theory divided man's time into two parts: work and leisure. Less work time meant more leisure time and vice versa.

Today, and even more so in the future, that time consists of three parts: work, leisure and learning. The continuing march of the technological revolution requires men and women to devote a large portion of their time to learning and mastering emerging innovations. There is space in this type of world only for those who are able to learn continuously. No law, no trade union, no political party can make an unqualified work force attractive to a modern company.

The world of the future will need staff to comport themselves rather like students with a fulltime interest in everything. This is already happening in various environments. Workplaces and homes are gradually turning into places for continuous study and learning. One thing is certain: Brazilians will be forced to choose between either studying a lot or having little or no work --- a choice between having highly

developed skills or being condemned to a lifetime of low wages!

In this race, we are already lagging way behind. While our workforce has only seven years of schooling (poor schooling at that), the Asian Tigers provide ten years of good schooling, Japan eleven, and the US and Europe, twelve years.

In Brazil, our educational deficiencies start right at the bottom, at the elementary school level. For this reason, secondary-level vocational schools and even universities are now being obliged to fill in the many gaps in young people's education, a residue of poor schooling at the lower levels.

While this poses serious problems at present, the situation is bound to deteriorate further unless Brazil substantially raises the quality of its education. Labour market forecasts indicate that by 2050 around 60% of workers will be required to perform jobs that do not even exist today. A good example of this was observed when the US auto industry started growing again after years of declining fortunes. In mid-2013, Ford and General Motors were seeking to recruit engineers to perform tasks that were previously unknown to most of them. The main demand was for people trained in electronics and computer science vital for designing, developing and producing the new vehicle models. If that is the case in the United States, what hope do we have here in Brazil, which is years behind in terms of education, innovation and productivity? Note that the average productivity of a Brazilian worker is a mere 20% of his American counterpart. This is a massive difference!

### **(Heading 1) Aiming at a Moving Target**

A key problem is that while schools are trying to remedy the deficiencies arising from earlier educational levels, they are being challenged to shoot at a moving target. When the required level of training is reached, they discover that technology has moved on, and that the new technologies demand a whole new set of skills. When a country increases its knowledge level by 5%, its competitor might have increased it by 10% or even 20%. The race will be won by companies whose staff are able to produce more, diversify their product range, satisfy demand, gain market share, and increase profits and investment profiles.

Knowledge levels also have wide-reaching effects on employability. Good thinkers are more likely to get a job. Quick learners are more likely to be retained. According to the management expert Peter Drucker, job security these days depends primarily on the ability to learn quickly and to go on learning throughout one's life.

At this point, I wish to digress a little to comment on what seems to be contradictory figures on education and employment in Brazil. Recent statistics have indicated that unemployment rates are lowest among workers with lower levels of educational attainment and highest among those who have graduated from elementary (and even secondary) school. How can this be explained?

This paradox results from two scenarios. Firstly, the economic growth model adopted in Brazil in 2003-12 focused heavily on the unskilled service sector (delivery personnel, domestic servants, construction workers, etc.). This was a period in which job opportunities for less qualified people expanded substantially.

Secondly, a mismatch exists between the requirements of the employers and the quality of young people leaving secondary school looking for employment. Quite

simply, modern technologies and new production and marketing methods demand the kind and level of skills that have not been taught in secondary school. To a great extent this reflects the backwardness of our schools. The upshot is that we are faced with school-leavers with no proper job qualifications and a mass of firms which are unable to recruit staff who meet required standards.. Bridging this veritable abyss between school and work is an enormous challenge. It is a frantic race against time.

There are two important features of this race: the starting point and the speed of learning. Robert Foegel found as long ago as 1850, that 90% of Americans knew how to read and write (Foegel, 2002). Subsequently I unearthed the fact that in that same year, 1850, 90% of the Brazilian population were illiterate. Only recently was a law approved in Brazil requiring parents to enrol their children in school from the age of four. In the United States, this law was passed in 1650! (Tocqueville, 1969). Moreover, while the starting point of education is of great importance, the actual speed of learning aimed at closing the gap is more crucial. In this respect, the US has been faster than Brazil: they have invested much more in education than we have over the last 150 years and, even so, are being overtaken by South Korea, Singapore and Finland in the PISA tests.

There is no doubt that for a company to have a competitive advantage, it needs a workforce that has the ability to learn. Machines have become relatively cheap, accessible and "smart". What makes a significant difference is the people who operate these machines.

I once asked the Indian Minister of Planning: Why does your country excel in information technology when computers are equally affordable and accessible all over the world? His answer was: We owe our success to three "e"s: English, engineering and education!

### **(Heading 1) Education and Productivity**

It is increasingly clear that education only makes a difference in productivity and personal achievement when it is of good quality. This largely explains why good employees from good secondary schools earn more than graduates from poor quality universities and other higher education institutions. Low quality education is of little benefit to anyone. Uneducated workers earn low pay, do not produce, do not innovate and do not generate profits. Hence, firms do not develop, make no profit and fail to prosper. At the other end of the spectrum, well-educated staff collaborate with the company in the process of innovation, the good use of inputs and the reduction of waste - all essential for productivity and competitiveness and, ultimately, for the country's long term growth.

Examples from history show that countries that have gone through severe crises have managed to recover by way of good education. Look what happened with Europe and Japan after World War II! Look at what happened in the United States after the recession of the 1930s! Think about it!

The 1929 crash had devastating effects on the US. Wealth turned to dust overnight. Industrial production fell by 50% and international trade shrank 70%. Over five thousand banks failed. With the advent of a merciless drought in the 1930s, crops failed completely. Unemployment soared to around 25%.

In order to provide some form of occupation for millions of people left with

nothing to do, the US government, regardless of the huge budget cuts, decided to expand public libraries to make space for the unemployed. This was done. The book collections were vastly upgraded, the number of physical facilities increased and opening hours were extended. At the same time, mobile libraries were put on the road to meet the needs of readers in the smaller towns and rural areas.

The result of this initiative was very, very important. For nearly ten years, millions of unemployed people took to reading. The outcome was as can be expected: in the midst of disaster and misery, the United States enriched its most precious asset - human capital - and was thus in a better position to face the challenges of renewed growth.

We can see the same pattern repeating itself today. Enrolment in American universities increased between 2008 and 2011 in the midst of the major economic downturn. The results will undoubtedly prove to be of strategic value when the US economy starts growing again.

### **(Heading 1) Shortage of Qualified Staff**

In Brazil, the dearth of good quality staff affects all sectors. Two-thirds of industrialists complain of the shortage of such people.<sup>1</sup> The fact is that a mere 17% of current employees in industry have completed full university courses, while only 43% have completed secondary schooling. It follows that with so few qualified people the prospects for facing the challenges of the 'knowledge society' are pretty bleak.

Just one example. I have a builder friend who in 2012 was engaged in constructing an oil refinery in the northeast. Every month he lost many of his best workers to the main contracting firm - from mechanics and electricians to foremen and engineers - all professional staff that he was unable to replace. The people he was then obliged to employ were of markedly worse quality, which had serious cost implications for the project.

In recent years, this type of "poaching" has become the norm in the labour market. A firm is only able to acquire good staff by stealing from another. In Brazil's important alcohol industry, for example, the shortage of good staff affects 76% of all the firms; in the clothing industry, 75%; in mining, 71%; in the machinery and equipment sector, 70%; in the auto-assembly industry, 67%. The hydroelectric power plant construction sector faces a similar problem. One result is that many firms are having to call experienced former employees out of retirement.<sup>2</sup>

Staff shortages also plague the aircraft industry and agri-business sector.<sup>3</sup> In the oil business, the situation is also critical and is likely to become more so when the vast offshore, deep-water 'pre-sal' deposits begin to be exploited (unless of course nothing is done to improve the supply of qualified personnel in the meantime). Equally worrying is the situation in the country's hotels, where qualified chefs, head waiters, receptionists and others can only be recruited by poaching from competitors. It is clear that the organizers of the 2014 and 2016 sporting events face a major challenge. It will be easier to build and equip hotels than to find adequately trained people to staff them.

In short, the current supply picture is serious. Brazil still has around 1.7 million young people aged 15 to 17 years who are not in school. Some 14 million Brazilians aged 15 or over cannot read or write. Of those who complete elementary school, only

half manage to go on to finish secondary school. Worse still, over 2 million secondary school graduates are neither studying nor working, nor looking for work. In this depressing situation, it is hardly surprising that companies complain of the poor quality of the bulk of our workforce.

### **(Heading 1) The Bridge between School and Work**

In addition to the quantitative problem, Brazilian schools (with rare exceptions) are failing to measure up to the qualitative requirements of the world of work. Quality is essential for meeting new demands. This includes the quality of professional know-how, overall mastery of the Portuguese language, text-writing and a good understanding of the basic concepts underlying any activity. When recruiting staff, firms are interested in more than CVs. They seek candidates who demonstrate good potential to assimilate new knowledge, who enjoy ongoing study, who are obsessive readers and, last but not least, those that are infected with the *virus of curiosity*. Firms are well aware that good work and good thinking go hand in hand.

At best, our schools teach students to pass tests. Those that teach thinking are in a minority. The ability to think arises from a student's mastery of the language. I attended a seminar in 2012 jointly organized by the Brazilian and Paulista Academies of Letters that was focused on 'defence' of the Portuguese language. Listening to the various presentations, I was shocked to discover how much the learning of our common language had deteriorated. An increasing number of teachers actually make a point of highlighting the use of distorted and incorrect words and phrases instead of teaching the basic rules of Portuguese. They are of the opinion that expressing oneself correctly is somehow 'elitist', and that writing proper Portuguese is a 'snobbish' activity. Thus, in order to appear as one 'of the people', students are encouraged to turn a blind eye to linguistic rules. Grammar has become politically incorrect. Unfortunately, these teachers mirror, to a large extent, what they have picked up in textbooks distributed by the Ministry of Education.

I need hardly add that this falsely democratic scenario, devoted to propagating language errors, has had a catastrophic result. Some recruiters are now having to put secondary school applicants - and even university graduates - through dictation tests. Just think, dictation! I was taken totally aback when an experienced "head-hunter" told me that out of 30 dictated words, candidates had, on average, got 20 wrong!!!

This disregard for language naturally affects the performance of students in other disciplines. It is impossible for a person to think properly unless he or she can use the oral and written word correctly. An example: in the OAB (Brazilian Bar Association) exams in 2012, 90% of the applicants were failed, the majority because they had no idea of how to express themselves and could not even understand what they were given to read. Inability to think obviously undermines the productivity of the entire workforce and imperils the country's development.

Despite this gloomy picture I still believe that not all is lost. I am, for example, encouraged by the fact that many Brazilian firms have shown willingness to invest in the preparation of workers (ABTB, 2010). Likewise, municipal governments and other official bodies are training job candidates, as well as people who have already been hired. The *S System* is increasing the number of vacancies in vocational courses.

Workers themselves are taking the initiative to enrol in vocational training and basic education reinforcement classes.

### **(Heading 1) Quantity vs. Quality**

When one talks of improving the quality of education it is often argued that quality and quantity are mutually exclusive. This is absolutely untrue! What if automakers had to sacrifice quality to produce more cars?

In early 2012, I paid a visit to South Korea. While there, I was informed that all children studied with the help of a personal *notebook*. This did not surprise me because these little devices are cheap and accessible there. But when they told me that all the teachers knew how to perfectly suit this technology's potential to the needs of each age group, I could not help expressing astonishment. How different it is in Brazil, where of the countless computers in thousands of Brazilian public schools, 96% are sitting in the director's office rather than in the classroom.

The most serious problem of Brazilian education in my view is not a shortage of machines, but a shortage of good course programmes and talented individuals who are qualified to manage schools and seriously educate students. These shortcomings are of course eventually reflected in poor labour productivity, low efficiency, exaggerated production costs and the resulting high prices of goods and services throughout the country.

The shortage of qualified staff bloats labour costs. Increasing workers' wages is good for the workers and the economy, but needs to be accompanied by corresponding increases in productivity. This is far from being the case in Brazil. In fact, the fact that our workers' wages are higher than those of some of our competitors is a matter of serious concern.

The average industrial wage in Eastern European countries is lower than in Brazil (all including social contributions). In Estonia, the average industrial wage is US\$ 9.47 per hour, while that of Brazil is around US\$10. In Hungary it is US\$ 8.40; in Taiwan, US\$ 8.36; in Poland, US\$8.01; in Mexico, US\$6.23; in the Philippines, US\$1.90; and in China, US\$1.36. <sup>1</sup>

It is these countries that Brazil is striving desperately to compete with. Needless to say, the results are not good. Our goods and services are simply not of the quality or price expected by customers. The problem stems, in large part, from our high unit labour costs which, again, are linked to the scarcity of good staff and the precarious situation of the educational system.

International comparisons indicate that Brazil is currently one of the countries that suffers most from low productivity and the lack of manpower. <sup>2</sup>

It is very important to note that the quality of education and productivity levels of the workforce in the countries listed are substantially higher than those of Brazil. In other words, the *unit cost of labour* is much lower than that which is indicated in the above figures. <sup>3</sup>

Rising wages and stagnant productivity drive unit costs up. In the case of Brazil, this situation has had a deleterious impact. Calculated in dollars, the 2012 *unit cost* was 158% higher than in 2002 - a staggering increase, unknown in emerging and even in the



most advanced countries, where the unit costs rose on average by only 15% over the same period.

With ballooning unit costs, companies are left with only two alternatives to balance their books. They start by shifting the additional cost onto the price of goods and services. Next, they are forced to cut their profit margins. The first alternative puts pressure on inflation and the second leads to reduced investment. The Brazil of today is plagued by both evils. We can see how high prices and weak investment are closely related to the labour factor, especially its low productivity, which consequently undermines growth. Recent data show that the share of productivity gains in GDP growth in Brazil is only 25%. The remainder stems from increased employment and incomes and the population's purchasing power. In South Korea, on the other hand, 75% of GDP growth arises from productivity gains, predominantly supported and driven by the good quality of education, with its beneficial effect on the workforce.

Brazil will not succeed in increasing its income based on increased numbers of people employed. This is because the population is aging and the proportion of young people is falling. The number of Brazilians of working age (20-64) will shrink from 137 million to 127 million between 2030 and 2050, meaning that future economic growth and income will hinge on improved productivity, which is in turn dependent on better education.

Improving education is undoubtedly one of the main determinants of productivity growth in any country. It is particularly relevant to Brazil, where most of the current workforce has low reasoning capacities, poor mathematical ability and defective command of the language.

To achieve sustained growth, labour productivity would need to increase by at least 3% annually and unit costs would need to be contained to yearly increases not exceeding 1%. This is a monumental challenge. Raising productivity to this level will certainly require the introduction of a plethora of reforms to our institutions as well as, crucially, a substantial improvement in the quality of education at all levels.

### **(Heading 1) Education and Citizenship**

As well as responding to the demands of the productive sector, Brazil needs to build generations of good citizens and substantially reduce the immense backwardness in the social areas such as health, justice, security, social welfare and education.

This discrepancy is a major cause for concern. Citizenship can only be properly exercised after a system of rights and duties has been thoroughly incorporated into the fabric of the country. Democracy thrives only where balancing mechanisms exist. We are far from that! For example, in the current Constitution the word *right* appears 76 times, while the word *duty* appears only four. The word *productivity* appears twice and, *efficiency* only once. What can be done with a country that has 76 rights, 4 duties, 2 productivities and only one efficiency? The long road towards striking a balance in these circumstances depends, to a great extent, on the provision of quality education.

Very few of our schools teach the values that are commonly practiced in the world of work, where the balance between rights and duties is essential. In my view, the schools in the *S System* are exceptions. I see them cultivating a real *work ethic*. My

impression stems from the numerous visits that I have made to these schools over the past 50 years. I have never witnessed SENAI students showing disrespect towards their teachers, damaging facilities, failing to care for tools, or disregarding moral values.

Why is this not the case in other schools? I think that the work ethic is the product of the interface between the *S System* schools and industrial companies. I have never seen a successful company that is dirty, sloppy and careless with its equipment and tools. The *work ethic* transmitted by SENAI is the result of this interface. In the modern world of work, an ethical approach is just as valuable as cognitive skills.

In short, the quantitative advances made in the field of education and training need to be urgently matched by overall quality improvements, and a more innovative approach to course work and methods for managing and delivering education.

Since the educational process is long term, Brazil needs to find a shortcut. The introduction of corporate initiatives is one. I see in these programmes an opportunity to repair the damage caused by poor quality elementary school education.

We cannot forget that good quality basic education is the key to solving the problem of the low skills of Brazil's workforce. Moreover, it is also the key to generating good jobs and for keeping people employed, enjoying rising incomes and practicing true citizenship. All in all, good education is essential to the general wellbeing of the entire population.

## **(Heading 1) Conclusion**

In the modern world, education as a driver of the economic growth of nations has increased significantly. Production processes are increasingly based on "intangible goods" (i.e. ideas). For any country to be successful it is not enough for its citizens to be 'informed'. It is vital that they know how to process and use that information as a force for change.

Technological changes occur at meteoric speed, and this calls for workers to possess the ability to understand and adjust. Types of machinery and equipment are becoming standardised and increasingly affordable in most countries. What will make a difference in the future is workers' ability to use this machinery and equipment efficiently. To do this requires good training and, above all, the ability to think.

Vocational training is a strategic part of education. Even more important is the need for students to have a good grasp of their own language and arithmetic. It is the mastery of these skills that helps individuals to reason, think and act.

The gaps in the educational field in Brazil are huge at all levels. Improving the quality of education is crucial to upgrading labour productivity in order to generate economic growth. The role that education can play in the progress of nations was never clearer than it is today.

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