

# Worldskills Americas and its Influence on Technological Development

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## Summary

In the following article, an analysis of the reality of El Salvador is proposed, from the point of view of Technical Education and its influence on the development and economic growth of the country, taking into account the different factors that affect such a complex phenomenon like macroeconomic growth.

The educational system of the country, at the level of Basic Education and Baccalaureate, has been experiencing, over several years, many changes at the structural level, methodologies, objectives, strategies to minimize dropout and educational models. Currently, we are working with the Competency-Based Model, although it is still too early to determine if it has borne fruit, since its implementation dates back to 2009, when the "Let's Go to School Social Educational Program" plan was designed. running since then to date.

Important steps have been taken in the innovation of education, however, the country still has a long way to go to reach an

educational level like that of other more developed countries, both technologically and socially.

The Worldskills International competition, takes place every two years in different host countries, it is the Olympics of technical skills in which countries from all over the world participate, demonstrating the skills of their competitors in different technical disciplines, such as: cooking, construction, industrial design, computing and automation, among others. Educators and students from high school to higher technical level participate in this competition. Educators generally assume the role of "Experts" whose role is to train, evaluate and support competitors, the latter generally are students of different specialties who prepare for months or years to perfectly master their technical skills.

Then, the Worldskills Americas competition is also developed, which has the same format, but limits its participation to countries of the Americas and Caribbean, so that later they can compete in the international edition. As a

country, El Salvador has participated in several editions of this competition, obtaining important results in terms of prizes, medals and honorable mentions, however and perhaps more importantly, it has served to establish a benchmark for comparison of our level of preparation with respect to the other countries, which, although not bad, is still far from reaching countries like Colombia or Brazil, which have obtained remarkable results at the international level. Currently, the foundations are being laid to systematize the training of young people and to be able to reach a competitive level that is comparable to other countries, in such a way that in the future better results are obtained and we are a reference at an international level, in terms of professional technical training.

Worldskills represents a magnificent opportunity to improve academic quality, introducing in the curricular design the evaluation and performance components that the competition requires, at the same time, it forces students and future professionals to raise their level of personal demand, motivating them to give their best effort to stand out and be able to represent their country internationally. All this has repercussions on the technological and economic development of the country, since a higher level of qualification of the professionals simultaneously raises the

quality of the manufacturing processes, in addition to opening new possibilities of expansion through innovation that future technicians can implement in their companies, in such a way that industry develops and likewise the country's economy.

### **Key words**

Worldskills, Technical Training, Technological Development, Economic Growth, Educational Models, Innovation, Competition, Olympics, Technical Skills.

### **Introduction**

#### **Brief History of El Salvador**

El Salvador is a small country located on the coast of the Pacific Ocean in Central America, bordering Guatemala, Honduras and Nicaragua, it has an area of 21,000 km<sup>2</sup>, a small territory compared to other countries, with a tropical climate and no greater natural resources. The activities of the primary sector represented, for decades, the largest source of income for the country, that is, it was an eminently agricultural country; Throughout its history, industrialization has tried to open a gap in the economy, becoming in the 1960s the country with the highest industrialization index in Central America, then an economic crisis came in the 1970s that caused a slowdown, this was accentuated in the 80's with the event of the armed conflict, until its

end in the early 90's. With the peace accords signed in 1992, the economy once again had a rise and, during the post-war period, the elected governments have been implementing various economic policies, which have paid off in one way or another, however, industrialization up to now is still in the development stage, it has not yet found that element that allows the country to make the leap towards industrialization, and that in turn allows a jump in the quality of life of its inhabitants. It should be noted that the progress has been, to say the least, remarkable, without neglecting the efforts that the governments of the moment have made, since the economy has been having constant and stable growth, but without breaking the underdevelopment barrier, a path that we continue to travel day by day and try to overcome.

## **Development**

### **Productive Sectors of El Salvador**

Currently, the predominant economic sector is commerce and services, which represent 65% of the national economy, the industrial sector represents 25% and the agricultural sector has been relegated to 10%. The industrial sector only represents a quarter of the country's economic activity, however, it produces 97% of exports and contributes 16%

to GDP, a not inconsiderable figure, but at the same time it gives us an indication of the direction that the country should take to achieve sustainable economic and social development. [1] For some reason, it has not been possible to make that technological leap that would return the status achieved in previous decades, being a subject that covers so many aspects, its complexity is inherent and, therefore, analyzing the causes of this economic stagnation must be a deep and long research task, in such a way that all the phenomena that concern it are covered.

### **Education and Development of the Country**

It is well known that education forms a fundamental basis in the development of any country, therefore, the search for academic improvement must be a constant task, both by governments and educational institutions, public and private, from preschool education through higher education.

This is where the dilemma arises, what strategies can give better results? What can we do that has not been done before? How do we generate this leap in quality in our educational system? How does this jump translate into economic and social growth?

The answers to these questions can be many and each country will solve them from its own realities, however, there are strategies that can be implemented and developed

collectively, as a sector, as a country, as a region, as a continent.

In this sense, governments and educational institutions must observe and replicate successful strategies proven in other countries, neighbors and non-neighbors, taking into account that they must adapt to the reality of each one, but without ceasing to subtract their essence, in such a way that innovation is a constant in curricular design and that the obstacles that prevent people from overcoming underdevelopment.

Technical Education has an especially important role in generating this change, since it forms the basis of technological innovation, there can be no innovation without ideas and no new ideas can arise without a technical-scientific knowledge base, which is achieved through academic training. For this reason, Higher Education Institutions must include in their curricular designs, the components of innovation, creativity, entrepreneurship and research, which develop in young people that spirit of transformation, which awakens the desire to create and innovate and which translates into the improvement of the productive processes of the industries, in such a way that their competitiveness increases and allows them to open spaces in international markets,

resulting in an increase in the economic growth of the country.

### **Dual Education vs. Traditional**

The Dual Education Model has its origin in Germany, a country in which it has proven to be successful. The Model is developed as follows:

In the Dual Education Model, school graduates are prepared for their future working life. Technical training lasts between two and three and a half years, depending on the trade and previous school training, and is carried out in a dual form in two places of learning: theory is taught in vocational schools and practice, in training companies. The apprentice spends three to four days a week at the company. He becomes a member of the normal staffing and his trainer instructs him in the various work processes of the corresponding specialized trade. Classes in vocational schools complement in-company training. These are carried out in so-called technical courses, in about one or two days a week. [2]

The issue of Dual Education is relatively new for El Salvador, taking the first steps in 2007 at the ITCA-FEPADE Specialized School in Engineering, which, with the cooperation and advice of the German government, implemented the modality for the first time. Dual Education with the career of

Mechatronics, giving phenomenal results in student performance. It is worth mentioning that the school, for years, has been forming cooperation ties with numerous companies in the country, which have always been willing to open their doors for students to carry out internships and professional practices in them, this basis served to improve the reception of the Dual Education Model.

The results observed in the academic performance of the students are indisputable, showing a better reception of the contents, a greater participation in classes and a more favorable evolution in the transition stage from student to worker.

Currently, the Dual Education Modality in the Specialized School in Engineering ITCA-FEPADE, is running with 6 technical careers, Industrial Chemistry Technician, Mechatronics Technician, Industrial Electronics Technician, Industrial Maintenance Technician, CNC Technician and Logistics and Customs Technician, these training and technical specialization areas, impact directly on the needs of qualified human resources that companies have, in such a way that students, upon completing their careers, continue working in the areas in which they were trained within companies. It is important to highlight the role that company-school communication and

feedback play within this process, since the main input for updating and improving the curricular design is the same training needs expressed by both employers and workers.

Currently, the Dual Education Model has matured a lot, having begun implementation 13 years ago, its results are notorious, and its impact on the lives of students is enormous, since it gives them the opportunity to know, in parallel to their studies, the reality of being part of the production plant of a company, this contributes to their integration into working life more effectively and faster. At the same time, it allows companies to generate social well-being, supporting young people who want to improve themselves and opening the doors for them to develop their full potential, in a win-win relationship, in which all the actors involved obtain a benefit and at the same time achieve their objectives. Companies obtain highly qualified personnel, the educational institution completes its reason for being and young people achieve their goals of personal and professional improvement.

The fact that traditional education does not have that component of integration and identification of young people with companies is noteworthy, which makes the introduction of young people who study under that system into the work environment

more forced, since it is not until they finish their degree, that they have the opportunity to know what it really means to work professionally for a company.

Professional technical education represents, for all the countries of the world, the key to technological development, therefore, the effort to make it grow and improve its quality must be constant and arduous, in such a way that international competitive standards are achieved, that allow companies in the country to produce quality goods and services that comply with the standards demanded by the most industrialized and technologically advanced countries. The companies participating in the Dual Education Model expect high performance from the students they support. In this sense, Worldskills contributes by developing in students a sense of continuous search for improvement, encouraging them to improve themselves to stand out in a country where job opportunities are scarce. Companies also benefit indirectly from the training that young people have during their preparations for competitions.

### **Worldskills as a Tool for Development and Innovation**

As already mentioned before, the Worldskills Competition represents a window to showcase the level of competitiveness that

countries have, through their educational institutions, testing not only the knowledge or skills of competitors, but also his mettle, professionalism, human quality and commitment.

Although it could be intimidating to compete against world powers whose resources and systems are much more advanced than ours, what should be highlighted is the fact of being able to learn from them, being able to establish a starting point from which to start working and training a system that allows reaching this level, taking into account that, like any training process, it must constantly evolve and correct itself, observing the strengths and weaknesses and attacking the points of greatest deficiency.

In this sense, the Worldskills Competition represents the perfect scenario to be able to raise the educational level of any country, since, by being able to compete directly with other countries, a reference framework is obtained to be able to evaluate and determine the points that need to be addressed with greater urgency and puts the reality of our educational system in perspective, from a positive point of view, because through competition, inputs and tools are obtained that can be adapted and replicated in our environment, thus strengthening the educational quality of both

the institutions in general, as well as teachers and students themselves.

Internally, as a country, Worldskills has turned out to be a phenomenal tool to improve educational quality at a technical professional level. Firstly, because it awakens a competitive spirit in young people and encourages them to improve in a self-taught way. Also, the fact of being able to travel and know other cultures, in addition to representing their own country, is a tremendous motivation for them, which translates into the professional growth of each one. Considering that it is a competition, this forces each representative to find a way to stand out from the others to obtain that first place that allows them to live the experience of participating and competing at an international level. This transformation encompasses, not only the Competitors, since they are an extension of an entire system. That includes the educational institution, which provides its facilities, equipment, machines and tools which must be at least similar to those of the other countries to be on an equal footing. It includes the educator who assumes the role of Expert, who must grow with the student and be demanding himself to be able to be demanding of the Competitor, they are the one most responsible for good performance before and during the Competition; The three actors,

institution, Expert and Competitor, must act synergistically, in such a way that the process of training and development of skills is fluid, harmonious, evolutionary and constant, only in this way can success be achieved.

It is for this reason that competition becomes such a valuable tool, because, although in the end, only one Competitor wins per Skill, in the process all participants were growing and improving, learning both from the Experts and from each other. This process generates a cascade of development, since growth and learning will be reflected in the professional life of future technicians, engineers, graduates, or whatever profession is chosen. Performance in the labor field will be enriched and will result in an improvement in the processes of the companies and in the quality of their products or services, then these improvements will bring benefits to the country, such as economic growth, better tax collection and improvement in the quality of public services.

Of course, the panorama presented is not a result that will be obtained overnight, it may even be utopian, but it is important to start taking the first steps, and without a doubt, participation in Competitions of this level deserves to be supported and given continuity to achieve the objectives that as a country should be raised.

The participation of the ITCA-FEPADE Specialized Engineering School in the Worldskills Americas Competition began in the 2012 edition, held in Brazil; on that occasion, two Mechatronics Engineering students participated, their participation was highlighted with honorable mention. In 2014, it participated in the leaders' forum in which it enrolled the ITCA-FEPADE Specialized School in Engineering, as the representative of El Salvador for Worldskills Americas. Between 2015 and 2017, teachers from the School of Dual Education participated in international training, obtaining certification as Marking Experts in the areas of Mechatronics, Welding, CNC, Robotics and Cyber Security. The second participation in WSA was in the 2019 edition, held in Sao Paulo, Brazil; On that occasion, 3 students competed, one Industrial Maintenance Engineering student and two Mechatronics Engineering students, who obtained third place, surpassed by Colombia and Brazil with second and first place respectively.

In 2019, the first national qualifying round was also successfully carried out with the official Competition format; 50 students from all over the country participated, in the Skills of Mechatronics, Cyber Security, CAD, Cooking, Electrical Installations and Automobile Technology. Future participants

who will represent the country in future editions were elected from this Competition.

Currently, the ITCA-FEPADE Specialized School in Engineering is in the process of preparation, with the vision of participating in the next edition and standing out among all participating countries.

Companies participating in the Dual Education Model have shown interest in the Competition and have supported students by providing materials, providing the use of training facilities, uniforms and per diem. This shows that the Competition is significant both at an educational and business level.

### **Conclusion**

El Salvador is taking important steps to promote industrial activity as a source of technological, economic and social development.

The education system has been renewed year after year, introducing innovation tools, better academic resources, new technologies and vocational workshops. Although Technological Education is not yet a priority, it has been given a lot of support and is beginning to be seen as such; With the creation of government offices specialized in science and technology, the aim is to further promote development.



The ITCA-FEPADE Specialized School in Engineering, with more than 50 years of experience, is an institution with a long history and national and regional recognition, characterized by its learning methodology based on labor competencies and its predominantly practical teaching vision; ITCA-FEPADE has positioned itself as a benchmark in Higher Technical Education at the national level. In its constant search to improve educational quality and contribute to the development of the country, the ITCA-FEPADE Specialized School in Engineering has entered the Worldskills Americas international Competition, which has brought benefits to the institution, its academic staff and students; Among them we can highlight, the training of its teachers as trainers of specific Skills in Worldskills format, various technical trainings and conferences in which students and teachers participate, as well as the renown that the ITCA-FEPADE Specialized School in Engineering has gained internationally .

The path that has been traveled as an institution is enviable, but it is recognized that much more remains to be done; For this reason, the ITCA-FEPADE Specialized School in Engineering continues the constant work of preparation with the vision of participating in future editions of the Competition and to have its representatives stand out, aware that

the benefits obtained from it are enormous and that in the future we can be recognized for our high competitive level and our professionalism in the field of technological, scientific and innovative education.

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