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Actions to be taken in Mexico towards education 4.0 and society 5.0

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Article Info

ABSTRACT

Education in Mexico has not evolved in the way it is taught and evaluated. In the historical moment that postmodernism enters, it has not been possible to adapt to Information and Communication Technologies (ICT), or rapid technological innovation, or changes and trends in the industry, to the sharing economy or the rise of distance races. In its analysis, an essential deficiency is detected in the current education models, and it is detected that educational freedom is nil or scarce, which has led to poor student performance, high youth unemployment, which cause severe social problems and the economy of the economy. The current government is working closely with the private sector to connect education and promote employment. It is necessary to grant public schools more autonomy, freedom and responsibility. This paper explains how to act so that Mexico can adapt education 4.0 with solid steps to reach society 5.0.

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1.   INTRODUCTION

In Mexico, education has a material impact on the economy of the country that directly affects society, the increasing use of technology has generated new business in the economy [1, 2]. However, all the before, It caused a high impact on the habitual citizen, this factors to create an effect on the labour market and allow to capture the attention of the political causes [3]. In the previous years, unemployment in Mexico was variable (see Figure 1), and there is concern about the deceleration of development, which damages stock market operations and efficiency [4]. Several years ago in the literature, a field had been raised that suggests that technological originality may later replace with machines an essential section of the work that humans currently do.

However, the historical experience of innovation suggests that more productive new jobs are likely to emerge that change the role of human beings in dangerous and repetitive tasks to replace those that Technology has resulted [5, 6]. Nerverthless, the economic and political impact and the uncertain nature of the second-order effects of this change naturally refer to the laws and regulations of drafting. It is evident that in Mexico, education policy and the labour market are in extreme reform [7]. Successful evidence from countries such as Germany and Sweden suggests that the desirable direction of education is:

a. Decentralization: the transfer of control of institutional study projects and teaching practices to professors, parents and students;
b. Transfer the bargaining power to private workers, their employers and local communities.

As it is possible to see, it is essential to reform education knowing the best practices. According to INEGI [8]. The 2017 seasonally adjusted unemployment rate in Mexico was 3.4%, compared to 3.6% the previous year. However, in Germany and Sweden, unemployment rates are below average (3.2%). By consolidating high unemployment rates and poor academic performance, lagging government ules are hurting the effectiveness of workers and the comfort of a massive group of citizens.
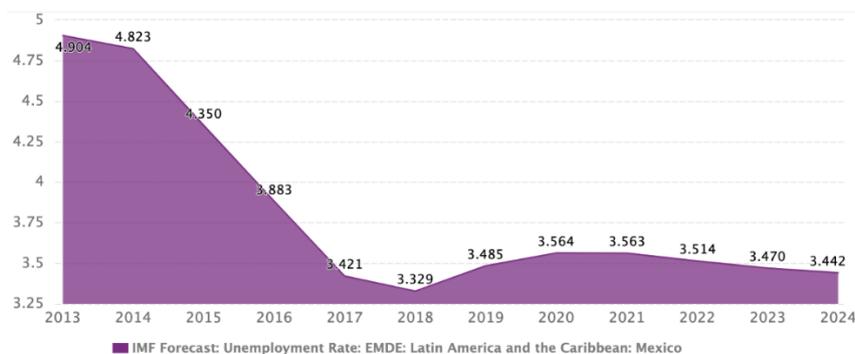

Figure 1. Unemployment in Mexico [4].

2.   THE CASE OF GERMANY AS A PREDECESSOR OF EDUCATION 4.0

Since reunification in 1990, Germany has undergone a significant shift towards decentralization both in its educational system and in labour market regulations. This election proved to be vital in increasing efficiency, making the economy more competitive and reducing unemployment from historical scenarios. On the one hand, the country went through a remarkable decentralization of the determination of wages from the level of the industry to the level of the private firm or the individual worker [9].

Also, the German higher education system moved mightily in the direction of greater regionalization in the last two decades. Also, the country's successful education and training projects, also supported and financed by the private area, reflect the strong interaction between workers, employers, the common area and other social partners. According to the German economic development agency, today's VET system provides more than three hundred certified training occupations, and more than 549,000 vocational contracts were signed in 2012 alone [10]. Besides, through its active link with the business area, the dual system is highly valued, primarily among businesspeople.

3.   THE CASE OF SWEDEN AS A PREDECESSOR OF EDUCATION 4.0

Sweden's spread of education without dependency has improved academic results. After the structural reform of 1992, Sweden is another country that has moved towards a higher level of decentralization in education. However, in the face of the German or Dutch experience, recent educational reforms, such as the Swedish Education Law of 2011, focused more on selection independence, independent academies and student safety [11, 12].

The increase in school proficiency and the definition of profit objectives in schools has increased the academic achievement scenarios, improved conditions for professors and, what is more relevant, favours students, especially those with a less privileged background [13, 14].

Besides, the increase in the proportion of students from independent academies has improved academic results both in the short and long term [15, 16]. Beyond the fact that this may surprise in the light of Sweden's relative reduction in the PISA test scores, the authors also do not find significant positive effects on academic results for the past few years, when the scores of the Swedish relative tests decreased dramatically.

4.   THE CASE OF JAPAN AS A FOUNDER OF SOCIETY 5.0

In 2015, under the impulse of President Shinzo Abe, the Japanese Government, with the business federation, Keidanren, launched its criteria of Society 5.0, which it later refined [17-19]. For many researchers, such as Lorenz Granrath, coordinator and director of research of the Japanese National Center for Science and Technology, indicates that society corresponds to a criterion more corresponding to Industry

4.0 as it puts society within the scope of industry, in At the centre of the ongoing technological revolution, the purpose is to achieve a "superintelligent society [20].

There is the talk of a criterion, or a plan, which does not have an organization, does not contemplate partial quantitative objectives, nor a precise budget. The German criterion has its origin in the high-tech strategy of the German Government, of 2014, which defined six priority fields: the economy and digital society; the economy and sustainable energy; a revolutionary field of work; The healthy life; smart mobility; and civil security. Society 5.0 is named in this way because its proponents think that there were four types of societies before (Figure 2):

a. Society 1.0 hunting and gathering;
b. Society 2.0, agricultural;
c. Society 3.0, industrial;
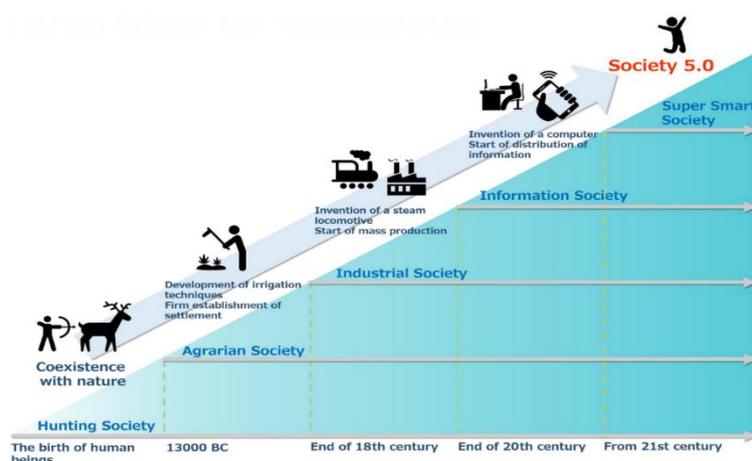d. The 4.0 Society of information.

Figure 2. Evolution of societies [21]

We are, according to this vision, now living the sophisticated integration of cyberspace, information and physical space (real world) to be formed by Society 5.0, centred on humans, in the people. The creation of knowledge from information is done by humans in Society 4.0, in the next phase of human society, it will be done mainly by machines, through Artificial Intelligence (AI), but at the service of people. It is an idea that is becoming very present in various national strategies in the field of Artificial Intelligence or digital agenda.

5. ESSENTIAL FACTORS FOR ITS IMPLEMENTATION IN MEXICO

The use of the above criteria or criteria in Mexico is part of the purpose or desire to use technology to make a better future. In a 15-year temporary educational test space, it will be possible to assess how these developments will affect and influence sectors of the economy and society at the level of the following technologies (See Figure 3.)[22]:

a. Internet of things
b. Bigdata
c. Artificial intelligence
d. The robotic
e. Blockchain

The formal definition of Society 5.0 that Mexico must continue is the following: "A human-centred society will have to be carried out that balances economic progress with the resolution of social problems through a system that integrates such advanced cyberspace and physical space ". The advanced fusion of cyber-space and physical means that all kinds of sensor data installed in the physical space will be collected through the Internet of Things (IoT), which will accumulate in cyberspace and that will be analyzed by artificial intelligence that will exceed human abilities.

Their results are going to be again inserted in the physical space in robots, autonomous cars or automated deliveries. Cyberphysical systems will be generated in this way. From the beginning, the need to

reach a higher level of security quality is recognized in the face of the likely cyber-attacks that are going to be more severe and will be more difficult to harm the lives of the crowd.
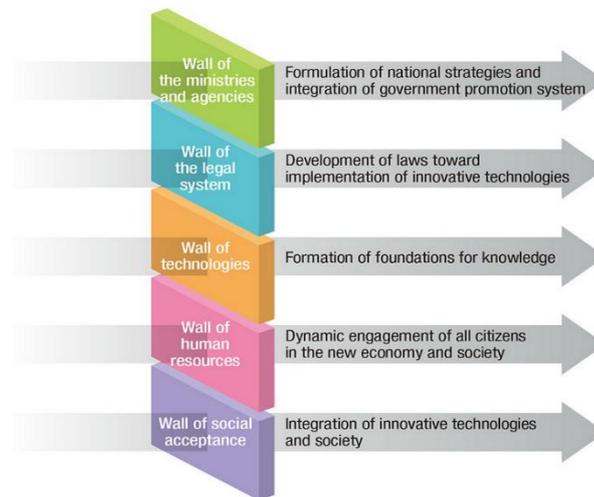

Figure 3. Society 5.0 (source: prepared based on materials from the japan bussines federation) [23]

This new type of super-intelligent society will be characterized in a society where the different occupations are finely differentiated and fulfilled. The approach of Society 5.0 should be managed for the use of three main changes [24-27].
a. Technological change;
b. Economic and geopolitical change;
c. Change of mind.

It is estimated in this way to promote competitive development and solve social problems, also through the evolution of capable localities or super-cities (Smart-cities).

6. CONCLUSION

Technological change is the essence of economic progress, there are causes to be sceptical about the grim conjectures about the future of employment and comfort as a product of the most recent wave of originality. On the other hand, the rapid technological change provides a compelling added argument to support without any doubt, the reform of Mexico's educational systems and labour market norms. Public policy has not achieved results proportional to the elements addressed to them; In several cases, participation has worsened the results. The good news is that the experience of other countries gives promise about the arrival and the possibility of sequels of the liberalizing reform. By continuing the example of Germany in the regulation of the labour market, and Sweden in education, Mexico will benefit as it is currently dealing with high rates of structural and youth unemployment. Finally, it is important that some governance systems will have to be reinvented (which are mainly economic development issues): for example, education, security, communications, and competition, among others. In addition, from a cybernetic perspective, a route that could help the understanding of the method for the design of actions to be taken before education 4.0 and society 5.0, are: a. Understand the theory and context of the fourth industrial revolution (inputs). b. An integral analysis of the soft and hard technologies required for such revolution (process). c. And finally, a holistic study of the possible impacts on education, economy, society and sustainability (outputs).

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