

THE IMPORTANCE OF SCIENCE EDUCATION IN DEVELOPING COUNTRIES

Periodically in our countries, the debate timidly arises about whether something should be done to support indigenous scientific development. Although, for political reasons, no ruler would dare deny the importance of science, the bottom line is always that science has undoubtedly been key to the development of contemporary society. Still, given our current poverty level, we cannot invest in these issues for now and are forced to wait until we are richer to do so.

That reasoning always closes the discussion. The result is that we remain at levels of investment far below the 1% of GDP that UNESCO recommends as a minimum for a country to aspire to develop. Those who think like this forget that rich countries are so because they have invested in research and development, and they will continue to do so more and more.

In some cases, the debate is refined a bit, and the most advanced in the government recognize that perhaps it is worth making a small effort in that direction, but exclusively oriented towards applied research aimed at solving specific problems. In no case can basic research be considered, which, according to them, only seeks to satisfy the curiosity of a few and should be the exclusive subject of industrialized countries that have the means to do so. The other thesis that is frequently put forward is that the real engine of research and innovation is the market, which is the one that sets the course in this regard, and, therefore, we must limit ourselves to exploring what it asks of us.

The reality is quite different. In recent years, the distance between these two areas of research has been dramatically reduced, and the time that elapses between the laboratory and the production plant is less and less. As a result, major technological breakthroughs owe much more to fundamental research than market interests.

The examples that we can cite are innumerable. It is enough, however, to recall some specific cases to confirm these statements.

When Hertz discovered electromagnetic waves, he was only looking to confirm a prediction made by Maxwell a few years ago, and by no means he was trying to develop a new communication system that the market was clamouring

for. Except for some enlightened people like Jules Verne, nobody imagined at that time that one could converse directly with a friend who was ten thousand kilometres away.

Closer to us, in the middle of the last century, various research groups were applying methods based on the discovery of X-rays to determine the structure of minerals to study organic molecules. The most important result of these works was the determination of the structure of DNA, which generated a true revolution in the life sciences with numerous applications for the benefit of health or agriculture. It is worth mentioning that without the knowledge derived from this discovery, it would never have been possible to develop effective vaccines against Covid 19 in less than a year.

Given the above, there is no denying the importance that basic science has played in constructing the modern world. Therefore, any nation that aspires to reach an acceptable level of well-being today must support the development of science to contribute to universal knowledge and attack specific problems of a given country.

Within this context, science teaching at all levels is a key element from multiple aspects. On the one hand, it helps raise awareness of science's importance and fosters a favourable attitude towards the subject in society. On the other, since basic scientific knowledge is essential for anyone, helping them to perform better in a world where science is behind all the elements of daily life. As Nobel laureate Leon Lederman said, "in the 21st century, scientific illiteracy is as serious as not knowing how to read was in the 20th century".

Science teaching contributes to awakening curiosity and creativity, two fundamental characteristics of the scientist, and should be so of any human being. Likewise, it contributes to developing the critical spirit and ethical values, essential qualities to build a more balanced society. For this reason alone, it should be a central part of any person's education, regardless of his field of activity.

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