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Education, Knowledge and Innovation from a Mechatronics Perspective

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Abstract

The new European strategic framework for 2014-2020 focuses on intelligent, durable development, favorable to inclusion. In this context, the role of the educational system is essential from both perspectives: it supports the development of the society through learning and contributes to the research and innovation activities.

Applied in education and research, the Mechatronics concepts allow a higher involvement of all the actors in the learning process. At the same time, Mechatronics ensures the framework for the conceptual approaches, operating methods and tools for reaching the objectives of the Integrated Education and the development of the educational technologies suitable for a knowledge-based society.

This paper addresses the synergy between education, knowledge and innovation from the perspective of the Mechatronics education due to the fact that the education system has a major contribution in developing the new profile of a worldwide citizen.

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1. Progress through generating knowledge

In the context of the transition towards the knowledge-based society, the European Union, through the Europe 2020 Strategy, aims to ensure the framework for an intelligent and durable development, favorable to inclusion [10]. Regarding this aspect, one of the priorities of this strategy is “the smart growth represented by the development of an economy based on knowledge and innovation”, which entails the integration of the new technological infrastructures with the research, development and innovation processes, and also the educational ones, contributing directly to the development of the intellectual capital, considered the primary resource of the society today.

Ensuring a sustainable development is based on generating knowledge which results from the stimulation of the intellectual capital's use. The aspect of the massive knowledge diffusion, through its main effect – considering knowledge as the main economical resource – will impose a change in perception and also in the practice of obtaining added value.

Knowledge generation, the intensive use of knowledge, represents the essence of some processes that have an economical outcome, but society represents a more comprehensive framework than Economy. Progress, beyond the economical effects, represents a more complete achievement of the human personality.

2. The Knowledge Triangle: Education, research, innovation

The knowledge triangle represents the cornerstone of the 2020 Strategy for Europe in achieving the desired level of competitiveness at worldwide level. [2]

By establishing tight and efficient connections between the three sides of the triangle, education, research and innovation, the education's contribution to occupying the work force can be increased.

2.1 Knowledge and education

A major component of any activity, particularly the socio-economical processes, knowledge is a result of perception, learning and reasoning. Increasing the level of knowledge directly depends on the lifelong educational and professional training system, which supports directly the creation of a new profile of the individual engaged in the knowledge-based society, one that is characterized by lifelong learning.

The educational system must play a fundamental role in the consecration of a society. The countries that knew how to invest in education to broaden the access to preparation and to improve the educational and professional training standards have, in time, obtained the most spectacular and the most durable economical growths.[4]

Education represents the essence of the human capital. It is a means to disseminate knowledge, to develop skills and create values, and the formative contents target both the cognitive components that reunite aspects of an intellectual nature of the educational offer, the driven components that include skills, abilities and competencies specific to the training profile and the direction of specialization, but also the affective and behavioral components that target responsiveness, flexibility, motivation, attitudes and beliefs, feelings, in short the conduit of the subjects to be educated.

“Education must be related today to psychological, cultural, economical and social stakes, having multiple competencies, often contradictory. Its ultimate finality is finding forms of freedom, equality, solidarity, dignity and prosperity in the post-modern society”. [3]

2.2. Creativity and innovation

Creativity is more and more one of the essential human implications of the contemporary culture and civilization, of any social progress. It represents one of the most important human, social and educational values.

Creativity consists in the capacity to combine and recombine former experience in new patterns, of shaping, restructuring the perceptive experience in new and diverse configurations, in the ability to discover unexpected connections between things, in new structures, in a certain experience, in providing perceptions in a new way;

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