La formación de recursos humanos en innovación regional y apropiación de la ciencia

The formation of human resources in regional innovation and appropriation of science

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Resumen

El presente artículo presenta una propuesta de formación de recursos humanos en temas estratégicos de innovación regional y apropiación social de la ciencia, llevándose a cabo de agosto a diciembre del 2013, con una participación de 43 académicos de los Institutos Tecnológicos, Universidades Tecnológicas, la Universidad de Guadalajara y el Consejo Estatal de Ciencia y Tecnología de Jalisco, con la intención de fortalecer sus prácticas en investigación, innovación, desarrollo tecnológico, visto como un medio que coadyuvará en la resolución de problemáticas educativas, sociales y de desarrollo económico de su región se impartieron cuatro módulos de formación: innovación y desarrollo regional, ciencia, tecnología e innovación, registro de propiedad intelectual y comunicación social de la ciencia.

Palabras claves: formación, innovación, ciencia, apropiación social.

Abstract

This paper presents a proposal for human resources training on strategic issues of regional innovation and social appropriation of science, taking place from August to December 2013, with a participation of 43 academicians of the Technological Institutes, Technological Universities, the University of Guadalajara and the State Council of Science

and Technology of Jalisco, with the intention of strengthening their practices in research, innovation, development technology, seen as a means that helps in resolving problems, social, educational and economic development of its region were held four training modules: innovation and regional development, science, technology and innovation, intellectual property and social communication of science.

Key words: training, innovation, science, social appropriation.

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Introduction

The popularization of science is a discipline about the scientific knowledge to the society in general, likewise the public communication of science is relevant in the knowledge society we live, so the formation of human resources in communication, disclosure and dissemination of products emanating from the scientific and technological research, as well as the processes and systems of innovation and development are fundamental to strengthen scientific culture in society, by which the Secretary of innovation, science and technology of the Government of the State of Jalisco has generated a proposed academic for the formation of human talent, to make possible a more broadly, science communication.

For this purpose was held by this dependence, a diploma in regional innovation and appropriation of science, from August to December 2013, with the participation of 43 scholars from the Technological Institutes, Technological Universities, the University of Guadalajara and the State Council of Science and Technology of Jalisco, with the intention of strengthening their practices in research, innovation, technological development, seen as a means that helps in solving educational problems, social and economic development of its region were offered four modules of training: innovation and regional development,

science, technology and innovation, intellectual property and social communication of science.

The participants of this course formed a learning community, each module is enabled in the Moodle platform where they were the contents, activities, guide and support required in this type of learning experiences. The tools designed for the management of personal work and in Group were the following: email, forums, working groups, Board News, agenda, documents, links Favorites, presentations, videos, etc. With this type of training, aims to improve the capacities, skills and knowledge of those professionally related to the field of management of R & D, corporate communication in public or private research centers, promotion of scientific activity, the transfer of knowledge or science journalism and outreach; areas where the demand for professionals.

Developing

The social appropriation of science is essential to foster creativity and innovation because "knowledge is a complex construction involving the interaction of different social groups. The production of knowledge is not a stranger to the construction company, develops within it, based on their interests, codes and systems "(COLCIENCIAS, 2014).

The social appropriation of science, can be recognized as the incidence of the reception and assimilation of scientific and technological knowledge and beliefs about the everyday lives of people.

Different virtual environments that allow the teaching outside the classroom, but in this research we chose the virtual platform Moodle course to design the training of human capital in science, innovation and technological development. The case of the Higher Technological Institutes of Jalisco. The reasons are:

- Alternative Free Virtual Platform since it can be implemented at low cost
- It can provide better quality education

- Moodle leverages the integration of information technologies in universities to improve teaching and learning
- Innovation in the learning process
- Facilitate communication through the transfer of information given in this environment
- You can change the platform according to the needs, by being open source

Carrying out this course virtually, allows students to interact with the teacher individually perform their tasks and upload them to the platform. It is based on the training of teachers of the Higher Technological Institutes of Jalisco course, which in addition to being submerged with themes and concepts related to science, innovation and technological development, they may develop skills and technological skills that will certainly be of utility in their respective institutes.

The Ministry of Innovation, Science and Technology (SICyT) together with the Directorate General of Higher Education (DGES) seek to achieve certain objectives, among which is to create conditions conducive to promote, coordinate and contribute to regional development through innovation and educational, scientific and technological development of the state. The need to design and implement this course helps meet this objective, in addition to supporting the vision proposed by this agency which is to position Jalisco as the most innovative and with the highest rate of technological development in Mexico State.

Another need of this dependence which seeks to answer the design of this course human capital formation in science, innovation and technological development in virtual mode for teachers of the Higher Technological Institutes of Jalisco is to assist in the development of public actions and private related to the advancement of science and technology in the State of Jalisco, through focused development of innovation in Jalisco, dissemination and popularization of science, the promotion of intellectual property among other programs.

Social appropriation of science and technology

In order to determine whether a social appropriation of science and technology in the city of Guadalajara is convenient to put ourselves in history, in the world today it is in a time called information society. The social appropriation of science and technology manifests itself in everyday and everyday life of the people, so that society is affected in very different ways in different collective activities.

This phenomenon can be seen in the increasing use of information and communications technology (ICT) by the people, and also seems to be unstoppable, so the expansion and the incorporation of ICT in the life of each inhabitant of this planet is inevitable and unstoppable, to a greater or lesser speed, depending on the country or region.

This event brings huge inequalities encompassed by the term "digital divide" and manifested again the difference between regions and countries, that is, the differences between rich and poor as it was in the industrial revolution are emphasized.

The appropriation is not only in this case, for example the use of ICT, but in actual use to use, as well as all actions taken with the incorporation of ICT in the daily life of individuals and better defined by Echeverria (2008, 175 p.): "Space capabilities are characterized by what could be done, which depends on the available technologies and their knowledge and skills in the use of ICTs".

The ability of individuals to incorporate ICT into their daily lives varies across countries or regions; bringing one to the exclusion of several issues, whether labor, social, gender or age group, as it says Echeverria (2008, p. 176).

The social appropriation of science and technology has as one of its strategies to incorporate science and technology into the educational space. This incorporation must be an ongoing process, starting from the primary.

Specifically, the social appropriation of science and technology is one side in the dissemination of knowledge between every individual in the society, and on the other, to

implement strategies to incorporate fully the benefits of science and technology. This process includes scientists, to education, to political society and the business society as described Hoyos (2002, 53).

Public policies on science and technology

The importance of science and technology is not at issue, since its effects as a social phenomenon, political, educational or cultural, the results are clearly evident in aspects of development and quality of life of the inhabitants of the countries first world, as stated Saldivia (2006, pp.16-17) and says:

"... No one disputes the importance of science and technology to help develop and improve the quality of life of people. So it is not surprising that the first world countries allocate large sums to scientific research and technology development; For example, in 2000 the US allocated almost 3% of GDP; Japan, 3%; Sweden, more than 4%; Finland, just over 3%; Belgium, 2% ... ".

Social benefits not only been able to achieve in the historic first world countries, but in the last two decades there are cases of developing countries such as the case of China invested 1.49% GDP for research and development or cases of Singapore with 2.61% GDP, China-Taipei with 2.64% Korea 3.49%, this in the year 2008. This contrasts with what Mexico invested that year was about 0.35% of GDP.

But the situation is worrying because countries in the region such as Argentina which invested 0.51% of GDP for research and development. Mexico has stopped its progress in this area in relation to countries such as Chile, Argentina and Brazil, which show evidence of efforts to take science and technology as their possession of government policy.

The task of using science and technology as a tool to help troubleshoot rulers no longer start the development of societies, lies only in the fact of investing a lot of money, investment is only one of the parties and the need to create a strategy that includes the

appropriation of science and technology by society, raising the educational level of the same, including science and technology as part of the process of learning to help generate vocations on scientific careers in young people, spread in society the subjects of science and technology as well as application and benefits, develop strategies for implementing science and technology policies in line with the context of Mexican companies.

Within this scenario, in the State of Jalisco state government it has implemented the first phase of the so-called National Network of Jalisco whose objectives are (Ministry of Planning, Government of Jalisco, 2010):

- Providing a network of all schools, health centers and offices of state, municipal and federal government of a wireless broadband Internet access and other applications.
- Approximately 30% improvement in education (coverage and utilization)
- Improves rough in health services 40% (coverage, quality and timeliness). "

Moreover it is mentioned as impacts such as "... that gives the student new tools to build the very process of teaching and learning, as is the case. Wikis, forums, blogs, etc." (Ministry of Planning, Government of Jalisco, 2010).

This suggests that the implementation able to improve the process of learning, not only extend the geographical coverage.

Education, science and technology

Education is identified as the solution to a significant number of a corporation, individual, region, country, state, city; and that achieves the economic, social, political, cultural, geographical areas are understood, etc. This manifested by different organizations and international and international institutions. Which generally manifest that education is the tool that can help overcome poverty, to any company or individual to live better every day and have a better life.

Statements such as the Ministry of Public Education (SEP) states that "... education, science and culture have no boundaries, and that on the contrary, they are the best bridge of understanding and brotherhood among nations, as well as opportunity for a partnership between society and government. "

As also saith the Presidency of the Republic reflected in the National Development Plan 2007-2012 which states: "Quality education should train students to levels of skills, abilities, knowledge and skills demanded by the labor market. It should also promote the ability to manage feelings and emotions, and to be forming in values "(Government of the United Mexican States, Presidency of the Republic, 2007).

Meanwhile international organizations such as UNESCO (ECLAC, 2009) report on a study conducted in Mexico entitled "Mexico: impact of education on rural poverty" evidence shown consistent basic education in Mexico is an important mechanism to help individuals to get out of extreme poverty both as moderate. Moreover, the impact is greater at higher education levels and rural areas. Thus, one can conclude that it is wise to invest in education in Mexico.

Given the importance that education plays in developing societies have conducted various analyzes, studies and research in order to identify and understand the factors that influence the educational level is not the same in similar societies.

In the city of Guadalajara, despite being the number two most important city in the country, education is not homogeneous, nor sufficient level you might expect. Different national and international indicators highlight the transcendent that education is because it can achieve that citizens can make informed decisions, improve health and living standards, achieving a safer and more sustainable environment, building a world of peace, dignity, justice and equality, social development, etc. (UNESCO, S / F)

Meanwhile the Summit of the Americas (2005), the Educational Panorama (2005) report states that "Education is considered a fundamental human right," and he also says that "it is

known that education also carries individual benefits, family and groups in terms of improving opportunities and increasing the welfare of people and communities. "

In this sense says you have to work hard in each of the countries in the region to go to reach the goals set by the Organization of American States (OAS), with the above is not to say that no results or not you are working. It also recognizes that there are differences between each of the countries in terms of coverage or level of education and that these are due to social, economic, political, international issues that affect the educational outreach of society.

For its part Guadalajara no exception to the above factors, which influence the homogeneity and the extent that education can have in the city. Education is a normalizing action on the one hand, but also enhancing the free thought, criticism and inventiveness. Being strictly cumulative, that is being planned in the contents and methods, the order in which you access them is essential. The knowledge and skills that characterize science are accessible only to the extent that it is shown a previous competition in lower educational levels (Echeverria, 1995)

Effects of science and technology in society

Never before as in the past decade the company had shown interest in science and technology, but the image he has of it is based on events which is the protagonist such as travel to the moon, the invention of cell or using devices to play music in MP3 format or the Internet; where the last three taken as a definition of youth activities in the digital age, is the definition by the parents or grandparents of the young, where phrases like "if you are not on the Internet is talking with your cell phone or listening to their resting square of music. "

The concept of effect refers to the fact that achieving a change in behavior or a structural transformation of society. These changes or transformations are searched with the use of science and technology are that the individual will have an impact on their lives positively.

Also these changes are manifested socially by increasing scientific vocations and interest groups to participate in a major way in the dissemination and financing of S & T (Villaveces, Orozco, Olaya, Chavarro and Suarez, 2005).

The effects of science and technology can be evidenced in developed countries primarily in structures manifesting communications, transport, energy, food, health and social welfare to the small details of domestic and personal life, showing the positive side to help solve problems such as such as poverty, crime, unemployment, overpopulation, health, etc .; often referred to as the negative pollution in all its expressions, as they say Vazquez, Manassero, and Acevedo Acevedo (2007, pp. 44-47).

The effects of science and technology have changed the ways of relating between individuals and societies and their structures. His influence society perceives mainly in the economic activities in the workplace where companies increasingly is common to use technological devices. Currently the companies are immersed in the phenomenon of globalization, where each society, but forbid, he interacts with others. Taking into account that when a society constantly evolving one reason is because it has failed to include.

Meanwhile society is defined as the grouping of individuals in order to work in mutual cooperation to achieve cover some necessities of life, where the outcome of his group to form families, villages, cities, countries, regions.

It is noteworthy that the society of which we speak is important relative participation of the direction in which science and technology, as one hand is the one that provides you with your taxes budget for the development of the same. For his part, citizen attitudes toward these decides if applied in society.

In developing countries it is imperative to provide the citizens of a scientific and technological culture so they can identify the advantages and disadvantages of the application of science and technology in society and can objectively determine the social

desirability of the application and not only individual convenience that can lead to the marginalization society for their individualistic interests (Sandoval, 2006).

The National Science and Technology Agenda

Within the Agenda referred to the social commitment of science and technology through linkage for social development, acceleration of economic growth through the instrument of competitiveness as well as the generation of better jobs and decreasing poverty, ignorance and inequality and improving the quality of education and strengthening of scientific culture. "Making knowledge and innovation a key lever for sustainable economic growth in Mexico, which promotes human development, enable greater social justice, strengthen democracy and peace, and strengthen national sovereignty" (Consultative Forum on Science and Technology , 2012).

Picture No. 1

Basic agents in the generation, accumulation and distribution of knowledge

The role of universities in the National Innovation System

Three functions
HR training
Investigation
Dissemination of knowledge / third function: to contribute to the development process
The experience of developed countries shows that a university can hardly serve the three functions well at the same time, the need for specialization
Supply problem: You need to prepare the IES professionals and generate the knowledge required by the productive sector
Demand problem: It is necessary that the demand for such professionals and knowledge is generated.

Human Resources Training Innovation, Science and Technology

The processes and systems innovation and development are essential to strengthen the scientific culture in society, so the Ministry of Innovation, Science and Technology, Government of the State of Jalisco has generated an academic proposal for the formation of human talent, to enable a broader sense, communication of science, that purpose was accomplished by this dependence, a diploma in regional innovation and appropriation of science, from August to December 2013, with a participation of 43 academics from the Technological Institutes, Technological University, the University of Guadalajara and the State Council of Science and Technology of Jalisco, with the intention of strengthening their practices in research, innovation, development.

Methodology for the delivery of the diploma

Running Time: 120 hours taught in four months.
Breakdown of hours: 80 hours attended independent way and 40 hours in person.

It was completed with the virtual platform for independent work hours, whereby the participant of technological and educational development activities, interaction with faculty and students, among other resources will be provided; Or, provide the corresponding material (topics and learning activities, assessments and other resources) for through the Directorate General of Higher Education said platform is enabled.

Training modules

1. Innovation and regional development
2. Science, technology and innovation
3. Registration of intellectual property
4. social communication of science

General purpose

Strengthen academic of the Technological Institutes of Higher Education of Jalisco practices in research, innovation, technological development and appropriation of science as a means to assist with the resolution of educational, social issues and economic development of the region through methodologies that guarantee the validity of scientific research.

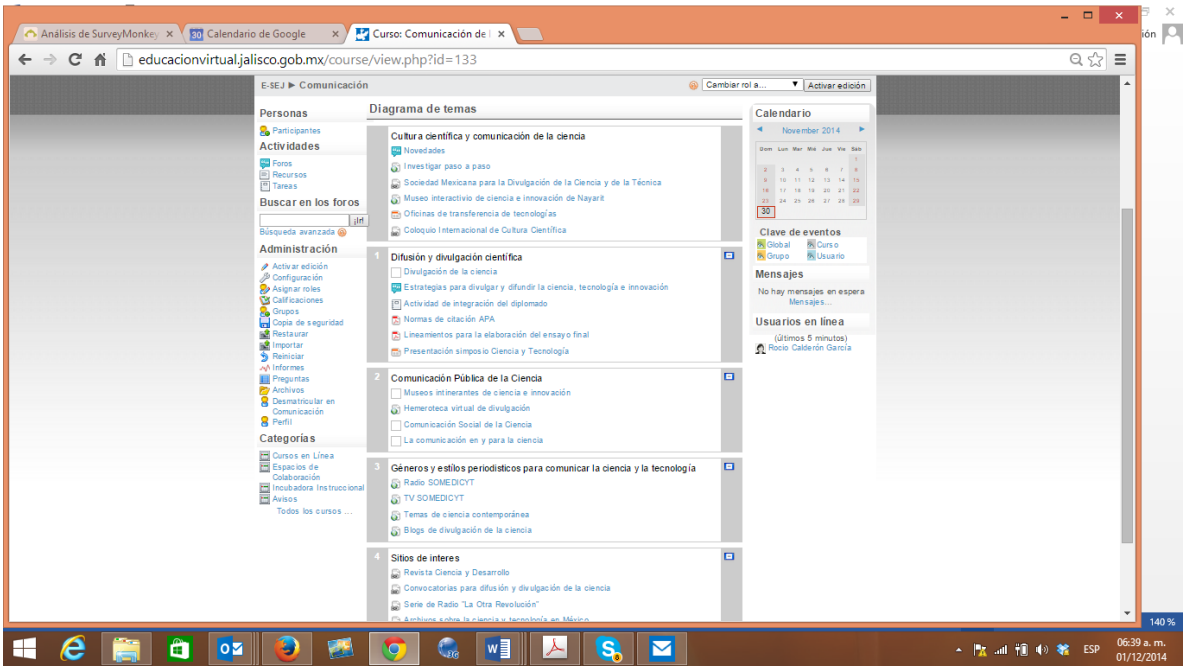
Specific objectives

- Provide key elements in detecting and strengthening of regional and sectoral innovation systems within the State of Jalisco, linking the policies of their local and national policies.
- Recognize the importance of research to generate knowledge for the benefit of regional development.
- Distinguish and apply the stages of research as key elements for scientific validity, based on the statement of the problem until the implementation and transfer of research results.

Professional profile

Scholars of Higher Technological Institutes of Jalisco develop its main activities promoting scientific culture, science communication and / or applied research projects in support of regional development.

Picture No. 2



Picture No. 3

Conclusions:

- Scientific research, technological development and innovation are essential precursors of competitiveness, economic growth and social development, contributing to the achievement of greater production of goods and services in all sectors of economic activity. enabling all Jalisco have better levels of welfare to improve their quality of life.
- The processes and systems innovation and development are essential to strengthen the scientific culture in society.
- The training of professionals and research staff in regional innovation and appropriation of science, can act as mediators between the agents systems R & D and society, the business community or the political sphere is, in our current situation, a growing social need.
- As well as facilitating the acquisition of knowledge, skills, attitudes and responsibilities specifically addressing the relationships between science,

technology, innovation and society from an interdisciplinary outlook, so that the necessary integration of knowledge which will enable meeting such demands.

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