Problemas, perspectivas e innovación del trabajo académico en la universidad pública. Un referente de análisis prospectivo

Problems, perspectives and innovation of academic work at the public University. A prospective analysis benchmark

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Resumen

Este artículo aspira a contribuir a la reflexión sobre el ordenamiento institucional y la regulación del Estado en la articulación de las políticas de evaluación, financiamiento y cambio institucional aplicadas particularmente a la formación universitaria de profesionales y saberes, con el fin de desarrollar, producir y transmitir conocimientos. Para ello se discuten las condiciones y las argumentaciones del concepto de modernidad, donde está ubicado el quehacer de la universidad pública latinoamericana. Desde una óptica prospectiva, se aboga por una universidad transformadora e innovadora, que participe

exitosamente en los procesos de generación, transferencia, intercambio y difusión del conocimiento mediante las TIC.

Palabras clave: investigación, Universidad, Estado, TIC, análisis prospectivo.

Abstract

This article aims to contribute to the careful consideration on the institutional system and the Regulatory State in the articulation of evaluation policies, financing and institutional change applied particularly to the University training of professionals and knowledge, in order to develop, produce and transmit knowledge. So are discussed the conditions and arguments of the concept of modernity, where the work of the Latin American public University is located. From a forward-looking perspective, it advocates a transformative and innovative University that successfully participates in the processes of generation, transfer, exchange and dissemination of knowledge through ICT.

Key words: research, University, State, Information and Communications Technology (ICT), prospective analysis.

Fecha recepción: Mayo 2015 **Fecha aceptación:** Diciembre 2015

Introduction

In the Knowledge society, the function of the intellectual and the institutions of higher education are two fundamental axes that allows us to face new challenges. Therefore, it is important to analyze public policies for higher education in the context of globalization, which requires institutions, develop new forms of knowledge production and transmission. Based on the context of globalization, is now required a society built from specialized knowledge, with specialists of high level (people of knowledge), and where knowledge is the good of higher value. This defines the society of the knowledge as "a variety of knowledge and experiences (knowledge) applied in a systematic and deliberate mode to

the task of defining what the new knowledge required is, whether its adquisition is feasible and what has to be done so the already available knowledge is effficient" (UNECSE, 2001, p. 6). Knowledge, therefore, applies to systematic innovation to achieve a strategic integration that is based on the knowledge and experience of the individuals that make up the different production levels of a society.

Economic globalization at the level of the financial markets, is a reality; however, this globalization beyond economic interdependence because it also covers the transformations of time and space of the people. The communications revolution and the spread of technologies are closely linked to the globalization process; them satellites and computer allow it communication electronic and instant, benefiting not only them transactions economic, but also the mode of life of the regions. The globalization is a set of processes defined by factors economic and political, that on the one hand transformed the life of the societies and them institutions social, and by another, expand systems and transnational forces (Giddens, 2001).

The current discussion about the function of the University in the economic growth and the Knowledge society, has its background in the impact of it education and the economic growth, where is stands that the human capital is essential for the development of the society. Within the neo-classical growth models are the contributions of Roustow and Solow, who will explain the economic growth in relation to the increase of employment and the assets of capital, taking into consideration the constant growth of the population as one of the main variables but leaving aside others, i.e., the economic growth they relate directly with the work and the wealth of capital. This position is limited due to the small number of variables taken into account in economic growth; on the other hand, other authors included different variables, one of them being the quality of workmanship, allowing to achieve higher growth levels (Lucas, 1988; Krugman 1993; Romer, 1986, 1994).

It is thought that economic growth is the result not only of the capital-labor binomial, but also of skilled labor and the wealth of ideas in a society, called human capital.

Making it more productive to capital and labor, and that could impact on growth is the introduction of technological innovations arising from research and development that impacts on improving learning in the work process, as well as in the process learning and education, guaranteed, with skilled labor and the wealth of ideas, changes, developments and processes and diffusion bonding between research, development and education with the productive sector in general.

The ideas are considered, from this theoretical perspective, as goods that promote economic growth supported by innovation and new ideas. Such knowledge and ideas are suitable from use, generating production and reproduction. In this sense, the endogenous growth theory attaches importance to learning processes related to the production process and to investments that strengthen education and research, reaffirming the importance of human resources with educational levels to contribute to economic growth.

Knowledge and innovation in higher education

The knowledge society raises the need for innovation in organizations, which involves changes in processes within them. Innovate arises when it comes to modern industrial organizations, such as social innovation in the development of institutions (schools, universities, utilities and labor relations) both.

The innovations are related to the economic progress of countries and the level of productivity of industries, but this requires knowledge and skills; therefore, for a country is not enough to have technological or organizational capacity development in work processes, it is vital to have the knowledge possessed by individuals. Developing countries arises because of technological and social innovations, plus the culture of integration and knowledge at the service of society, ie, the knowledge society, which is the cornerstone in a global society where knowledge is conceived investment of nations. Knowledge is the number one factor in production, leaving aside the capital-labor ratio.

Currently in our society, whose organization is based on the production and distribution of goods, it would be best if all countries could come to a postindustrial stage built on knowledge and in which technological development in information part of the transformations economic, cultural and social already initiated.

In the educational context it is proposed that this innovation will impact on the perception of learning, ways of acquiring knowledge and transmit it, because society and students have already incorporated the use and management of digital information and technologies. Is a priority more widely incorporate these innovations in education institutions.

In the knowledge society, the fact that higher education institutions to introduce information technologies allow these can be interconnected with each other, impacting directly on streamlining the exchange of information. Also, use of these technologies will implement new ways of acquiring knowledge, it can be certified that educational institutions.

Some necessary for building the knowledge society features are:

a) Develop scientific knowledge.
b) Have development, use and knowledge of technologies.
c) The role of education and training of human resources should have the function of developing creativity through the development of analytical capacity and understanding of the subjects.
d) changes in education systems, in the forms of transmission of knowledge and to improve the quality and excellence.
e) a relationship between knowledge and effective application and use of it in society (process of social appropriation of knowledge) is required.
f) To generate social learning processes from research on continuous improvement and innovation.
g) Knowledge societies and institutions should have the function of developing individuals and prospective strategic thinking (Didriksson, 2000; UNESCO, 2000; UNECSE, 2001).

In our opinion, the above features are necessary to build the knowledge society, as the relevance of them have higher education institutions in the intellectual development of society in the formation of highly qualified human resources, as well as follows the development of science and technology. Similarly, of those characteristics it comes the need to innovate the concepts of the learning society and the social learning is allowing internalize knowledge. This internalization of knowledge is what generates the changes in attitudes and values that translate into changes within organizations and institutions and the development of skills that can be applied in their environment and adapt more effectively to its context that is constantly changing.

Learning and new forms of knowledge production

Within the context of change is relevant social learning, understood as the accumulation and appropriation of skills and capabilities in emerging areas of science and technology in a certain stage of economic development, so that social learning is defined as "a process encompassing society and the economy as a whole, where the transfer of knowledge and technology occurs and that mediate and determine the cultural and higher education "institutions (Didriksson, 2000, p. 25).

It is important to the development of social learning because it is expressed in a particular national capacities of knowledge, science and technology. Socially appropriates learning and allows technological innovation; in turn, learning via knowledge and technology transfer can be achieved by patents and socio-institutional changes in higher education.

Patents allow you to create new knowledge, allowing evolve the economy of nations and, in turn, the socio-institutional changes in higher education have to be based on changes in its processes and structures. Both are necessary to create the company and the university that you want.

Higher education should be considered as production objectives and knowledge transfer. To achieve it requires significant investments to produce knowledge, to train human resources in new areas of knowledge as well as improve the quality and capacity of the academic and administrative staff of higher education institutions.

Knowledge in higher education are located in academic programs, curriculum and research projects. We must remember that in the new context knowledge acquired an economic value and social value would be given by knowledge workers.

Learning is the acquisition of knowledge that generate changes individually or collectively. Seen this way, knowledge is continuously acquired both inside and outside the school. Also in the knowledge society is essential to access, use and communicate information, and use properly raised time and constant learning.

Another aspect to consider is changes in the forms of knowledge that have been consolidated primarily in Physics, Chemistry and Biology, and later and more incipient way in the Social Sciences and Humanities. Gibbons (1997) believes that addressing the changes in the production of knowledge is important. For analysis and distinction traditionally called Mode 1 and Mode 2 mode to the new mode, considered emerging, while traditional remains dominant.

Table 1. Forms of knowledge production

Modo 1	Modo 2
Se solucionan problemas determinados por intereses académicos.	El conocimiento se produce para su aplicación.
Es disciplinar.	Es transdisciplinar.
Se caracteriza por la homogeneidad.	Organizado en forma heterogénea y de manera transitoria.
Es jerárquico y preserva su forma.	No se institucionaliza en el contexto universitario.
Utiliza un reducido número de actores para la solución de problemas.	Requiere de interacción entre un número suficiente de actores, y el conocimiento se difunde a través de la sociedad.
Utiliza escasos mecanismos en control de calidad.	Utiliza un mayor número de instrumentos para su control de calidad.
	El proceso de conocimiento es más reflexivo (la preocupación por el impacto de la investigación es uno de sus prerrequisitos).

Source: Gibbons (1997).

With regard to mode 2, the main aspects to consider are that:

1) coexists with the traditional and poses his disappearance, but to be its complement.

2) The production of knowledge is distributed socially in individuals that make up society through communications, as the socially distributed knowledge production leading to the creation of a global network to expand their interconnections through the creation of new places production, which should incorporate the innovations in communications and technology.

3) The technologies and new forms of production and dissemination of scientific communities also contribute.

4) The development and extension of this innovative mode 2 of knowledge production and access to knowledge is possible with the collaboration of governments, scientists and intellectuals and among nations.

5) This requires a more flexible transformation in institutions designed for policy concerning education, science, technology and competition policy to generate knowledge socially distributed.

This is a task for all countries with low production problems and lack of knowledge and skills to access this technology, which is currently available through technology.

You should review the learning content (what you learn) and design for implementation new methods of transmission of learning contents, that is, "how will access learning, how it will transmit" the planned learning vocational training; the learning process should be based on the inquiry, creativity and interest in wanting to learn, so you should clearly state what is to be learned, why and how; should be teacher-student interaction in the exchange of knowledge where learning and the advancement of knowledge of both is guaranteed and, therefore, innovation of education systems. As for 0fines, contents, methods, evaluation and teacher profiles, these must go through a process of review and analysis.

It is important to know that in the future development of a knowledge society capacity building both on their reality as be able to use knowledge in the complex process of designing and building the future, ie, necessary knowledge must have a use for the present

but it must also be a facilitator for development and social change, which can only be achieved with the social appropriation of knowledge and social learning processes that are generated earlier.

In this transformation process involving the actors that coexist in the organizational structure of the IES, where the figure of academia is essential it is essential. Given its importance it is necessary to conduct a review of the profile you currently own to that from the information obtained, to develop strategies for upgrading the profile to new needs, and also review the effects of public policies that have designed and implemented for this purpose.

Moreover, we must not forget the importance of integrating the characteristics required of the systems of higher education, the transformation of IES and actors, if it is to achieve the participation of higher education in building the knowledge society.

While it is true that the development of the knowledge society, this is seen as the main factor of growth and progress, education is the process that will ensure the development of societies that are able to explain and understand new contexts and to build the future; so are inseparable education, science and technology for the development of this new type of society. Therefore, the excellence and quality of education should be part of the educational policies of governments in order to improve human capital, if we want to develop a knowledge society.

The focus of organizational analysis for the study of higher education systems arises from the system itself, that is, on one side of its main objective is the production and transmission of knowledge, and on the other, the study of the establishments, As parts of the system, whose functions are performed by the actors who play specific roles, particularly by academics, its main role the production and transmission of knowledge.

Because of this it is important Clark model to analyze the systems of higher education, it covers comprehensively the system function through establishments, actors, roles and functions of the organization, taking into account different interrelationships system level and the institution and hierarchies, academic status, authority and beliefs without neglecting

internal and external agents (Clark, 1987). Burton Clark proposes to address organizational studies of higher education, the relationship of political, bureaucratic, professional and market so called triangle of coordination, which places the state, the market and the academic oligarchy coordination, which in turn considers the existence of different levels of authority, department, faculty, institution, local government and national government.

At present it is necessary to address agendas that bring us new knowledge and allow us to propose solutions and development of higher education systems, so Burton Clark (1998) points out the need to expand knowledge in this field. It is worth noting that in the field of sociology of education remains relevant aspects resume for the immediate future are important, as are the substantive academic growth and innovative organization of universities. Therefore, this author argues that "we need to know more about universities as learning organizations in which the self-evaluation and self-regulation lead to cycles of self-improvement" (Clark, 1998, p. 94). Thus, the research fields of sociology remain forms of work organization and innovative development of universities; in the same vein is the proposal Brunner (2001) on the changes in higher education for economic development.

Transformations and innovations in higher education

Higher education in some countries and in Latin America presents problems mainly have to do with the University-State, such as non priority of quality, equity and efficiency. The State granted funding without accountability of the institutions, allowed free access to higher education, and left the regulation and functioning of the internal actors of the University.

Currently the State-higher education is given from results evaluation devices, so that the budget is awarded for achievement of objectives, goals and evaluation of processes and results. The State suggests HEIs to diversify their sources of income to increase their budget.

For the study of globalization-related education, globalization should be seen as "part of the environment in which education takes place, affecting relevant dimensions of the context in which it operates and to which it must respond and adapt" (Brunner, 2001, p . 6). From

knowing the development and problems of higher education systems it is considered that the main issues and challenges are the following:

Among the challenges to be asked HEIs in Latin America we can mention to advance more rapidly in communication, diffusion and incorporation of new ideas, knowledge and techniques. This would lead to a breakthrough in the production of innovations in different sectors of education. For such progress is made it is essential to develop knowledge networks in the process of economic integration of our regions and strengthen such networks from the interaction, exchange and dissemination of knowledge between academics, researchers and between institutions dedicated to the generation of knowledge.

In the new society will require exchange of knowledge and compare that complement efforts and avoid the isolation of institutions dedicated to knowledge generation and innovation. It is therefore necessary to use the concept and process of economic integration and globalization of communications, for the exchange of knowledge facilitates the advancement of technologies in communication and immediacy of information (Internet, satellite communication).

From the above scenario different proposals to address the analysis of higher education to new scenarios presented from the late twentieth and early this century emerge, so we start with the proposal Brunner (2001) within the line Organizational Studies oriented toward research of the changes and innovations that are developing, and the prospective changes of Higher Education Systems.

Development of Higher Education: dimensions and innovations

The challenges of higher education for the twenty-first century, require a number of innovations that will allow public universities to participate in the current context of global economic development. We believe that the transformation point to be worked on the following dimensions:

a) Access information wing. Given the enormous production of information, which the educational system has to do is to facilitate access to it, and provide the tools for selection, interpretation and use of the same.

b) body of knowledge. Education must change traditional modes of transmission and acquisition of knowledge due to the increase and this change observed in the different disciplines in the present.

c) Changes in the labor market. Labor markets in the past were more stable and higher education for the envisaged training of graduates should acquire the knowledge necessary for their performance in the labor market. Currently changes are observed in the occupational structure, where the services sector is growing; They are also more demanding education requirements to fill a specific job, one of the prerequisites savvy. This has created the need for new competences, skills and knowledge, which are constantly changing, which is related to the changes that occur in occupations.

d) Availability of Information and Communication Technologies. ICT allow multiply the ways of transmitting educational content mainly benefit education distance through electronic networks, and this technology will allow the transmission of information and new knowledge more rapidly, leading to new university model called virtual.

e) worlds of life. One function of education is the incidence and participation in cultural transformation of society where it is located, that is, must be actively involved in understanding today's culture considering pluralities.

The above dimensions allow us to understand that higher education in Latin America will have the challenge to how to think and create from a society that is rapidly moving ball and a model of post-national university, post-state, organized as networks take all the potential of ICT, which possesses a solid foundation in their core disciplinary aspects and also meet the so-called Mode 2 knowledge production. That is, as Brunner (2001, p. 15), to develop the ability to form symbolic analysts able to be inserted with power in the global arena, to be able to compete with college conglomerates northern states, while maintaining presence and local and regional roots.

Of the constraints of higher education in Latin America is not only the need to transform the target and the organizational structure of institutions of higher education, but also the relationship between university and state forms of financing, infrastructure innovation in information and communication and make more flexible its educational programs, among others, being the strongest of the weak development of their capacities of knowledge, human capital and technological, institutional and management innovations generation and capacity limitations, which today It is a structural deficit to compete and integrate into the global world (Brunner, 1999). Today, the main obstacles to innovation and transformation of higher education in Latin America are funding necessary for advancement.

Innovations from academic work in universities

Higher education in Latin America has to take into account their participation in the economic development of three main aspects considered global innovations: the interfaces, communication and competition, as the main they have initiated and strengthened in the future.

The interfaces are the new ways of organizing work from relations between education institutions and the external environment (business, innovation agencies, consulting offices, governments, etc.), where the university is not the only site of production knowledge. This requires changes in the academic labor market, institutional management becomes more entrepreneurial, student profile is changed, and the options are more flexible learning programs (distance learning and education for life).

Surge symbolic analyst, product of the revolution in information and telecommunications, which have the function to be experts in any field of activity, dedicated to manipulate information, and the production, adaptation, selection, transfer, application and innovative use of knowledge (Gibbons, 1997; Brunner, 1999; Didriksson, 2000).

This represents what will be new ways to divide and organize work with advanced knowledge, from providing professional services; that professional knowledge is concerned with the application of knowledge to solve problems in the production of innovative applications, as well as network management knowledge.

Another innovation to which we refer is communication within the academic context, where distance education programs and electronic networks are emerging as alternative activities; Also, we are in the era of the virtual university, where the public sector has to offer changes in training methods taught.

The changes mainly in ICT have generated changes in traditional forms of access to knowledge, so that our universities not only compete among the institutions that make up the system of the region but with the developed countries and the industry itself information, as well as with the various initiatives (companies, laboratories, agencies, consultants, etc.) engaged in generating and distributing knowledge (Brunner, 2000).

Towards a new university in the framework of the knowledge society

Latin America must diversify forms of generation and distribution of knowledge, because it focuses primarily on Institutions of Higher Education. One area in which higher education in Latin America needs to move immediately, is the incorporation of new technologies of information and communication not only for educational purposes in teaching and learning processes, but for the development of new forms of education , such as continuing education. The method is distance education, where the use of networks is essential for new learning environments (characterized by continuing education and distance learning). Changes also occur in the certification of skills and learning paths, so flexibility should be considered in the training processes for mobility and changes in labor markets.

It should be placed as a priority for development strategy to consolidate human capital, since competitiveness is based primarily on the knowledge and skilled human resources, so you should have this human capital capable of performing functions dedicated to the development and investigation. This will advance to a globalized economy where differences between countries are not aggravated, especially in less developed countries.

Immersed in processes of change accelerated in all areas, companies require changes in the organization and operation of education at different levels, mainly in tertiary education. The changes we have witnessed in the last decade of the twentieth century will be more constant and accelerated in the coming years in all spheres of life of society: economic, political,

work organization, production techniques, which will require new needs with regard to the skills and knowledge to enable individuals to participate in the labor market.

The changes that occur in the development of higher education will be the scientific and technological revolution that we observed in this evolution. The scientific and technological knowledge and the development of new information and communications technology will allow for faster development of knowledge and access to it, contributing to changes in process flexibility training and greater interaction and exchange between academic communities which will contribute to the improvement of educational quality.

The strategy for generating human capital within the above changes are required for a policy of education, research and training of labor, allowing a better quality of the workforce.

This should be linked to investment in science, technology, innovation in production and research processes, so it requires a redefinition of funding for research and development as well as a dedication to quality of education systems change and your organization . This implies a necessary change in general from flexible models, linkage relationships IES-enterprises, teaching-learning innovative, research and production sector as well as changes in the role of teachers and the role of the student.

The improvement in the quality of the workforce will be possible through education and training, which will contribute to raising productivity levels. Human resources required are those with innovative attitudes, flexibility and ability to adopt new production and technological processes. For the formation of these new human resources it needs to the education system to generate in students a culture of innovation, competition and productivity. To achieve this, the state's investment in training will contribute to raising productivity.

The prime role of the university is to train professionals with the ability to participate, adapt and function effectively in today's global society, without neglecting the social and humanist vocation training that allows them to participate in the development of their society (Gacel- Avila, 2000). In that sense, the current process of globalization requires

changes in the IES, as well as innovations and interfaces that enable progress towards the characteristics that are required for the knowledge society.

Transformations of the university: challenges and commitments

In addition to the modernization and development of globalization in education systems the reduction in funding the education system and the growth of private sector education and academic work fragmentation occurs because the staff did not joint research, teaching and dissemination in their professional practice. This fragmentation occurs mainly by hiring part time who would it essentially requires that you play in education. So institutions solve the immediate problem of care for enrolled students.

Meanwhile, academics is required to them to perform teaching, research and dissemination. This sector is allowed faculty links with the productive sector, through the sale of services and generation of income for the institution; Professor receives part thereof as compensation for the performance of an audit, consequently resulting in changes in the structure of academic work.

The scheme of social dissemination of knowledge by the university is modified from the use of new technologies to universal knowledge, through information and instant transfer because the product resulting from the research process can not be but university-owned agency or private company that financed it.

From the above, the university in the modern world should consider the beginning of transformation processes in their structures, be consistent in the scientific and technological demands and guiding the training of human resources towards an integrated and competitive economic context, that is, begins the process of "managerial approach" from the University of the changes that have been initiated in the organization, among which include:

a) Collaboration between universities and business for the new production of knowledge.
b) The new relationship between the state and universities.
c) Diversification of educational and scientific offer.

d) Changing roles of academics and students (predominantly individualism and competition).

In the case of the University and its transformations in the modernization, it is considered that the transformation that has begun is based on the existence of a rupture, leading to rethink and build a new University according to new social and economic demands. The new university that is emerging and that is built into the present is characterized by the following features:

a) The change of the State-University, where the first watches from outside and focuses on the second from the evaluation of the results, returning the functioning and achievement of the objectives of the institutions (regulated autonomy).
b) diversification of forms of funding from the budget reduction by the States to education spending.
c) Changes in the organizational structure of the institutions, through flexible, efficient structures that enable better attainment of its objectives.
d) Implementation of state programs that impact on income or wage compensation through the evaluation of academic performance from productivity with the aim of improving the quality of institutions (Ibarra Colado, 2001).

Changes in the economic context, in relation to institutions of higher education not only affects the structures and processes, but also the subjects themselves in it coexist: academics, students, administrators and workers. Hence, it is important to address the transformations of the university in the context of globalization from specific realities of each nation to attest to that.

In the institutional device of state regulation system are located on the University and from that this institution fulfills its objective as projecting what is called regulated autonomy, which are articulated assessment policies, funding and institutional change from government programs , which are being directed to the new requirements in the future is the training of professionals and knowledge for economic development and society. Therefore, these must be dedicated to the production and transmission of knowledge and attention required needs in context.

This framed in the new conceptualization of modernity, where the work of the university is located and dominates the assessment of the institution and individuals in order to achieve excellence. Accountability to the State is the new way to control the universities, which must also be accountable to society.

Conclusions

The transformation of the university and its influence on academic work and knowledge production occurs as a result of modernization. It is relevant to investigate the effect and the conditions under which academic work and the changes that it is caused from new public policies in the last decade have been directed by the state for college is done, involving a process Change according to the new economic and social circumstances resulting from the processes of global integration.

Adapting institutions of higher context of globalization with a view supported by the market not only institutional bureaucracy but also by academic staff own education, do conceive that that is the only formula conduction system no teachers from presenting alternatives inside, but on the contrary, exercising their labor practices within this framework, which will result in the total loss of autonomy and continue to observe how changes in their work process are decided not by their union but by the State and administrative HEI, based on the guidelines of the globalization process. Therefore "the modernization of the university should be understood from the recognition of the emergence of a new form of rationality which enables the regulation of institutions and the conduct of subjects in new terms" (Ibarra 2000, p. 2) .

Regarding the relationship between university and state in this decade benevolent relationship to the university for the remote monitoring and regulated autonomy is replaced, prevail assessment and monitoring of products whose processes by government regulations that ensure compliance are controlled programs and strategies designed to higher education.

The knowledge society is an innovative foresight for which the university must transform and innovate for their participation in the generation, transfer, exchange and dissemination of knowledge, with the use of ICT, since in the global knowledge society is the main factor

of wealth. Universities must address the creation of a professional academic profile in teaching and research functions, according to the current needs of society, economic growth and new functions of the university in the context of globalization and the knowledge society.

The prospective of the knowledge society and their relationship with the processes of transformation and innovation that in the context of globalization will require the university to participate in economic development, and therefore, that it can assist in building the knowledge society. Access to information, the stock of knowledge, labor market, availability of ICT analysis from sociology of organizations, where we place the model Brunner (2000), who points out the need to transform higher education in dimensions is done and life worlds. With regard to global innovations have been initiated, these interfaces, communication and competition.

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