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WHAT COMPETENCIES SHOULD BE PROMOTED, IN
UNIVERSITY STUDENTS, FACING AN UNCERTAIN FUTURE?

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Abstract

The mission of universities is to form citizens at the highest level so that they become active, autonomous, reflective and critical members of society. Universities take on this task in a complex, globalized world full of uncertainties. Among them we wish to highlight some that are related to the workplace and the economy (disappearance of some professions and appearance of others, the collaborative economy, the crisis of capitalism, population growth); others have to do with science and technology (impact of robotics on employment and lives, artificial intelligence, biotechnology, nanotechnology, etc.) and will substantially change lifestyles, values and habits. Finally, we will look at the risks of social involution and climate change. Taking these issues as a starting point, we propose a series of competencies that should be fostered in university students. This research seeks to contribute to the debate about possible future scenarios, issues that might arise, and how the University, through the formation of its students, could be a key institution in times of crises in governance. In order to visualize these futures, we will refer to certain key authors and comprehensively set forth some of the main prospects for the future, along with their possible repercussions, and then make suggestions.

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1. Introduction

A sense of vertigo in the face of fast-moving change has become widespread in this century, creating fears and uncertainties, as well as a concern about an unknown future that can scarcely be visualized, as if it were a shadow in the mist. Morin (2011) expresses these uncertainties at the individual, social and even historical levels, and insists on the need to confront them by understanding Others in their personal and social dimensions (peoples and ethnic groups). Bauman (2003), for his part, sees contemporary society as liquid and argues that humans today need to learn to live in a world of uncertainties. Bordoni (2016, p. 181) underscores the insecurity and uncertainty that have taken root in a large segment of citizens in the so-called developed countries: “We have all been deprived of obsolete social guarantees; we are all in a precarious state, insecure and impoverished.”

In the final analysis, uncertainties are generated by the explosive growth of scientific and technological knowledge being incorporated into society, which adapts to, resists or adopts these new developments, creating an impact on social life and on the lives of individuals. In this sense, the University find itself at a crossroads: What competencies should it foster in its students to enable them to deal with an uncertain future in a complex, globalized world full of unknowns?

2. Problem Statement

Negotiation is indispensable to avoid disruptive shocks resulting from the threat that the future represents for many people, groups, societies and countries. Peoples and individuals who feel they have no future, or only an undesirable future, will look for ways to destroy the future or the society that is laying the groundwork for it. Comprehensive, holistic, global negotiation, conducted with generosity and understanding, as expressed by Morin (2011) should include the strengthening and transformation of international bodies in order to foster inclusive world governance. The University, through its teachers and researchers, must address this situation and work at forming students who can intervene in the present and the future actively, critically and reflexively, but also the main current problems with a prospective vision on the different environments and scenarios that might arise.

3. Research Questions

What types of competencies should we develop in university students to address the future challenges of a society undergoing rapid change?

4. Purpose of the Study

This research seeks to contribute to the debate about possible future scenarios, issues that might arise, and how the University, through the formation of its students, could be a key institution in times of crises in governance.

5. Research Methods

The installation of uncertainties and the anxiety that they generate, along with the advantages (personal, social and economic) that some aspects of the future promise, have led to a revival of futures studies. This field comprises a variety of approaches; here we focus on the proposal made by Miklos and Arroyo (2016), which links futures studies to desire and expectations. Bas (2016) proposes undertaking management and planning with the explicit aim of detecting futures and considering their uncertainties and complexity. Mójica (2016), for his part, links futures studies with change and productivity, and distinguishes between forecasting (known as the Delphi method) and strategic foresight, which does not attempt to guess the future but instead sets out to build it by intervening in the present. Nevertheless, the author argues that the two approaches can complement one another, and that both need to consider multiple variables—economic, social, cultural, etc.

The consideration of different possibilities, and intervention in the present with an eye to procuring a certain future identified as desirable, figure frequently in the reports and proposals made by international organizations such as the UN, UNESCO, OECD, etc.

Futures studies are clearly necessary; Concheiro (2016), however, points out a weakness in the field: when futures studies present a better future, i.e., preferable or desirable futures, it must not be overlooked that, just as in the present, what is desirable for some might very well be undesirable for others. This weakness identified by Concheiro obliges us to seek and negotiate better futures from a global perspective, so that they do not accommodate only the interests of certain social classes, companies or a particular group of countries.

The methodology thus will be the prospective strategy, because the article is designed to give some acting approaches to improve the insertion of university students in different environments and to have an influence in the future.

In order to visualize these futures, we will not use the Delphi method; rather, we will refer to certain key authors and comprehensively set forth some of the main prospects for the future, along with their possible repercussions, and then make suggestions. Because of the limitations of the article and the amplitude of the problems and social realities, we have selected and grouped two topics (addressed in a succinct way) that influence key and relevant aspects for the human beings: health and longer life expectancy, as well as the activities that he or she will be performing (social involvement, work and leisure time) in a fast development context. The topics will be approached from the social knowledge, natural sciences and technology, with relevant authors opinions in each of the fields.

6. Findings

People's visions of the future are influenced by their own personal experiences and those of the social group in which they have grown up; by the ways they perceive the present; and by their values, perspectives, desires, and the knowledge they have constructed. These possible limitations notwithstanding, the authors' solid arguments and the quality of their research have convinced us to include them as relevant ideas and knowledge.

6.1. The main challenges from the perspective of social knowledge

Development

The concept of development, traditionally defined in terms of macroeconomic indicators, especially the GDP, has been expanded to include other dimensions and indicators, such as access to education; to basic services such as water, energy, etc.; and to health, these indicators in the end are linked to social and individual aspects.

Mójica (2016) highlights the need to approach development as a complex phenomenon that encompasses economic, social, cultural, environmental and political dimensions. After linking development to human beings' sensations and life experiences, Himanen (2016) contends that the most important objective of development is human wellbeing. Along these same lines, but in a more complex formulation, Morin (2011, p. 25) asserts: "*The notion of development encompasses multiple advances in prosperity and wellbeing, general improvements to living conditions, the reduction of inequalities, social peace and democracy.*" Calderón (2016) identifies human development with empowerment and autonomy of individual and collective actors who can deal with social and global changes and achieve their goals with dignity, while Castells & Himanen (2016) present a comprehensive definition that includes economic growth, dignity, sustainability and human happiness.

Economic changes and the impact of technology

Regarding the evolution of labor, Reger (2017), head of technology at Fujitsu, predicts that jobs will disappear, and that we need to debate what to do if there are not enough jobs. He also insists that knowledge will gradually lose importance, and that creativity will be more highly valued for solving problems. Dans (as cited in Criado, 2017) argues that the kinds of jobs we are familiar with will diminish, but other jobs will emerge to deal with tasks that today would not even be considered jobs. The prospect is that the losers will be unskilled workers.

Manyika et al. (2017) have presented a report about the job losses, changes in labor patterns and job creation over the period from 2016 to 2030; the authors assert that the impact of workplace automation will vary depending on income level, demography, and the structure of the country's industry. Among the main conclusions of this study is that in a scenario of moderate change, automation will eliminate 400 million jobs, and 75 million people will be forced to find a different livelihood. In the event of a more accelerated pace of change, the job loss figure will double, reaching 800 million, and those who are forced to change their profession will increase by a factor of five, to 350 million. This will unleash a cascade of substantial transformations and changes in the workplace, including the tasks that need to be done.

In a critical look at job losses and other consequences, Rifkin (2011) contends that if robotization and new technologies lead to unemployment and higher rates of marginal employment, overall purchasing power will drop, affecting the demand for goods and services and driving unemployment even higher.

The Nobel Prize-winning economist Tirole (2017) forecasts good pay for highly skilled and innovative jobs, but that it will be necessary to resort to aid or above-market wages to guarantee a certain level of income for other workers in order to avoid conflicts. He also anticipates a rise in "autonomous work" due to the new technologies.

With respect to the transition to a new economy, Manyika et al. (2017) argue that policy-makers and business leaders should embrace the benefits of automation and at the same time support the retraining of

workers for other jobs. Rifkin (2014), with a nod to the collaborative and solidarity economy, foresees the eclipse of capitalism and a greater role for the collaborative economy, which could help to reduce income disparities, democratize the world economy and create a more environmentally sustainable society. The collaborative economy has surged recently, and will also produce abrupt changes; in fact, it has already clashed with the old economy.

Another economic development alternative that has attracted attention is Bregman's (2017) proposal to reduce the work week to 15 hours and offer all citizens a guaranteed income. The author argues that these proposals will serve to eliminate poverty and its grave personal, social and economic repercussions, while offering a better quality of life for everyone, allowing people to work at jobs that they find fulfilling, thus spurring their creativity. Proposals like Bregman's, and others aimed at a leisure society, would allow robots to take care of the more routine, mechanical and boring tasks, without exposing low-level workers (the ones who would be displaced) to the risk of falling into poverty, thus avoiding potential social conflicts.

Crises of governance in a global world

Among the reactions to the economic crisis of 2007, the one unfolding in Europe and the United States stands out. The first reflection is that the economy has recovered at a faster pace than employment. A significant number of citizens have lost jobs and properties, middle-class workers are finding themselves falling below the poverty line, new jobs are precarious and pay less than the old ones, and governments have offered multi-billion-dollar bailouts to the banking sector: all of this has rankled citizens and eroded their trust in governments, traditional political parties, trade unions and social agents.

Castells (2012) analyzed the protest and indignation movements that the crisis sparked in Europe and the United States. He confirmed that many people in these movements did not interpret their experiences as a crisis, but as a chronic problem inherent to the current system. Many opposed the idea of growth for growth's sake, and environmental awareness was prominent in their arguments. Opposition to a consumer-driven society was interiorized, but there was no consensus about the type of economy that would provide everyone with jobs, housing and decent living conditions in a fair and sustainable way. This dissatisfaction has far-reaching consequences, because the dissidents mistrust governments and see traditional political parties as useless and incapable of defending citizens' rights.

Touraine (2013) argues that the effects of the crisis were multiplied by economic and financial globalization, which destroyed the relations between the economy and society. The author examines the division that has opened up between the real economy (production) and the financial economy. This speculative financial capitalism, characterized by extreme global mobility and powered by ICTs, has been driven primarily by the profit motive, with little consideration given to populations or persons. The crisis has aggravated and made increasingly visible governments' inability to intervene and control this new financial economy; meanwhile, dynamic trade unions have become a thing of the past, national business chambers find themselves weakened, and classic political parties inspire little confidence in standing up to the forces of global financial capitalism. In Touraine's view, there is no going back: what is needed now is a reconstruction of all social institutions so that they work on behalf of the subjectivization of actors and the preservation of the Earth (instead of only pursuing profit), with the universal rights of all human beings as their foundation.

We finish our review with Milanovic (2017), who focuses on the issues of the middle class in developed countries, struggling with jobs lost to automation and with globalization dynamics that often lead to the outsourcing of operations to low-wage regions. These trends have exacerbated inequalities and eroded social rights. Milanovic contends that the tendency is for inequality to increase, with one very wealthy and successful social class, and workers doing jobs that robots cannot do. Nevertheless, he believes that this tendency can be reversed, because a system with so much inequality can be politically unstable. Thus, he considers that everything will depend on the abilities of the “losers” to organize politically, and on whether they find political representatives to channel their anger and press governments and the economic world to implement policies that reduce inequality.

The loss of the relevance of the middle class, in the governance of the countries, has generated a tendency to plutocracy (Chonsky, 2017; Milanovic, 2017) where the governors take care of fundamental interests of the wealthiest citizens of the countries and big corporates.

The rapid changes briefly described above have left society in a cloud of uncertainty, which will deepen as the population grows, as the economy produces migratory movements, as impoverished populations pursue a higher standard of living, and as the world deals with the fallout of climate change. In the face of this uncertainty, part of the population will seek refuge in involution and/or a return to exclusionary nationalisms, racism, xenophobia, etc. Cybercrime will be another relevant factor for instability, together with the technophobias that will arise, especially if the forecasts of massive job losses hold true and the population sees no decent solutions. Added to this is the powerlessness of current forms of government, both national and international, to respond to these changes and issues.

6.2. Natural sciences and technology as an answer and a problem

The exponential increase of scientific knowledge is adding multiple new topics to the agendas of authorities, nations and citizens.

First of all, we will look at technoscience and some of its most relevant manifestations. Biotechnology is working on some of the major ills that affect humanity, such as death, disease and hunger. It is in the fight against disease where the greatest progress has been made, thanks to the integration of advances in biotechnology, nanotechnology and robotics (the implantation of tiny robots into the body). Even as death is the final point of all living beings, and the inevitability of death has been accepted by humanity with fear and resignation, research on ways to prolong human life, slow down or even reverse aging is drawing more and more attention from both the medical and aesthetic perspectives. The major pharmaceutical companies recognized early on the potential demand for products that would hide the effects of aging. Given these products' high level of profitability, much of the research undertaken by medical laboratories has been focused on this sector, to the detriment of serious illnesses that affect people in poor countries. Current efforts in the field focus on rejuvenation (De Grey, 2016), the assumption being that old age is a kind of self-intoxication, a process of damages accumulated over the years; if these damages can be identified and repaired, the body can return to a more youthful condition. The latest techniques include on-site repair at the cellular and molecular level, and when that is not possible, organ substitution (transplant) with another one produced through bioimpression.

It is undisputable that medical advances are improving the quality of human lives, and prolonging them. This will impact society in two ways: population growth and the challenge of ensuring quality of life

for an ever higher percentage of retirees. A growing population will need more food, causing a clash between those who advocate a return to more natural products and the majority of the productive sector that will make use of scientific research to increase food production. Genetically-modified foods and other breakthroughs in food processing will certainly continue occupying top spots on multiple agendas. Neuroscience, for its part, is making important discoveries about the functioning of the brain, and its synergy with ITCs will have a strong influence on medicine and on education. It will be important to contrast these advances and determine how they can be applied to enhance learning processes.

Finally, Bostrom (2016) poses the problem of artificial intelligence evolving toward a kind of superintelligence that surpasses the intelligence of all of humanity, a state called “technological singularity.” Although he estimates that this will not take place until sometime after 2050, he believes it could endanger humanity if the creation process is not properly controlled. He insists that robots built to learn and make decisions must also have an ethical and moral dimension, and that it is urgent to find ways to make that happen. The debate about the process, the benefits and the dangers of artificial intelligence is ongoing, and along the way the so-called Singularity University has been created, on the initiative of Ray Kurzweil. Its purpose is to prepare human beings for accelerated technological change; the optimistic future that Kurzweil proclaims, however, is not without its critics.

All of these technological and scientific advances are giving rise to novel ideas, like the transhumanist movement, and the belief that these technosciences can usher in a post-humanity, the fusion of the human being with technology, opening up possibilities of ending disease, prolonging life and improving human faculties (meaning the attempt to permanently or temporarily perfect the organic conditions and functions of the human body through technology, with interventions meant not only for sick people, but also for the healthy). These technological advances raise a series of difficult questions that we cannot sidestep: Will everyone have access to these advances, or only the rich? Are these the roads we want Humanity to take? And how can this be done respectfully, fairly, without jeopardizing people’s dignity and the very existence of human beings and other life forms on our planet?

7. Conclusion

Any serious proposal for dealing with this scenario must assume the importance of providing students with competencies that go beyond those of their specific field of study to include competencies for navigating a world of uncertainties. That should come out with changes in the learning-teaching processes that are offered at the universities.

Along these lines Manyika et al. (2017) assert that all workers need to adapt to the new circumstances, because their jobs will evolve alongside their ever more powerful tools. This adaptation will call for, among other things, higher levels of education, or spending more time on activities that require social and emotional skills, creativity, high-level cognitive skills and other abilities that are relatively difficult to automate. Tirole (2017) underscores the high value that will be ascribed to knowledge work, data analysis, creativity, horizontal cooperation, multitasking, and communication skills; he concludes the people who will adapt best are those who have acquired abstract knowledge that can be applied to different settings.

Rifkin (2011) questions the notion that the fundamental mission of education is to create productive individuals, and posits biospheric awareness as one of its key objectives. This awareness will lead people to empathize with other human beings and with different species. Esparza (2016) contends that the university should form students on the basis of essential values, and facilitate the confluence of different kinds of knowledge as a way to confront new challenges and the future. These different kinds of knowledge include creativity, adaptation to change and an innovative attitude. Pérez (2012, p. 141) considers that becoming educated implies “reconstructing not only conscious and explicit mental models, but also, and especially, the unconscious and tacit mechanisms, habits, beliefs and mind maps that govern our desires, inclinations, interpretations, decisions and reflexes as we face the changing, uncertain and diverse context that we inhabit.”

The Tuning Latin America Project (2005) based on the Tuning Project of the European Union, established 81 generic competencies grouped into 6 categories: a) citizenship/social commitment/democracy; b) environment; c) capacity to teach; d) relationship with context/setting; e) knowledge; f) personal skills. While much has been written about the importance of these competencies, the truth is that university formation overall continues to focus on specific competencies. This is due, among other reasons, to an undervaluation of the generic competencies, to closed or inflexible curricular designs, to the organization of contents in study plans, to a lack of ideas about how to introduce these competencies, and to resistance to change among different university agents.

With respect to the organization of knowledge, Morin (2011) states that fragmented knowledge produces global ignorance; instead he proposes complex knowledge and thinking that enables people to contextualize, globalize, and recognize multiple dimensions. Likewise, he argues that education must give high priority to learning how to understand others and how to deal with uncertainties that are individual, social and historical in scope. In order to make progress in this sense and to foster the inclusion of generic competencies, it could be relevant to:

- Define and reach consensus (in the university community) on the essence of the different university study programs, i.e., the competencies linked to the exit profiles of the different majors offered by the university. With this, we refer to the different kinds of knowledge that would correspond to each major.
- In the undergraduate programs, select only the essential knowledge and the main lines of present and future research and/or development, as a way to cope with the amount of knowledge being produced, the imminent obsolescence of much of it, and the difficulty of determining precisely which knowledge might be useful to students in the future. It is vital to equip students with tools for autonomous learning within their field of study.
- Give priority to the general competencies that are most relevant (for the university and the different study programs) and include them explicitly in the curricular designs and study plans. Although all are important, it makes strategic sense to highlight a few, on the basis of context and pragmatism.
- Organize the curriculum in large blocks of content that include different related courses sharing most of their specific and generic competencies; that will allow for overall evaluation of the different types of knowledge and skills.

- Favor student-centered learning by using educational and formational experiences that call for creativity (as opposed to rote learning); the elaboration of integrative projects that draw on knowledge and skills from different courses and disciplines (not just those of their undergraduate program); professional internships; simulation work (enhanced by ICTs); future projection and forecasting work related to students' study programs; ethical dilemmas that force students to incorporate knowledge from their area of study and other areas, along with competencies related to values, commitment, their context, etc.
- Promote projects (within the curriculum) where students from different areas of study work together, and use ICTs to organize collaborative educational experiences with students from other countries, cities, contexts and cultures.

We should make it clear that in universities we do not form workers; we form people (capable of working) who are going to live in a complex world, full of uncertainties, that will most likely undergo an increase in social, technological and environmental crises.

Given the importance and relevance of knowledge in the future, the University, as a setting for the creation of knowledge, must take the lead in moving toward a more technological world, without losing sight of what is truly human. University researchers and teachers must help to create a narrative that gives meaning to Humanity, challenges the present, and promotes an inclusive future. The grave shortcomings of political organizations and structures, along with citizens' current mistrust of these institutions, makes the University's initiatives in this area all the more necessary.

The University cannot combine 21st-century science with 20th-century teaching. It must face the new challenges and prepare students so that they do not become casualties of these changes, but rather reflective and critical citizens, capable of turning information into knowledge, of making decisions and constructing a complex, globalizing vision that will help them navigate the personal, social and environmental decisions they will have to make, and become agents of transformation and humanization who can live a worthwhile life, at peace with themselves and in empathy with other people and with nature. The University must speak with a strong voice in times of uncertainty, or it will be relegated to irrelevance.

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