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## **LEARNING TO LEARN IN UNIVERSITIES 4.0. HUMAN OBSOLESCENCE AND SHORT-TERM CHANGE<sup>1</sup>**

*Aprender a aprender en universidades 4.0.  
Obsolescencia humana y cambio a corto plazo*

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### ABSTRACT

The 4th Industrial Revolution has modified the model of society worldwide. Short-term change has taken hold of everyday life, and people who do not cope with it become obsolete. Under this scenario, the life and work of the university graduates

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became fickle since their near future grows in uncertainty. Thus, we aimed to shed light on human optimization pathways from Higher Education in the knowledge-based society and economy, which made possible a new industry. In this line, we conducted an analysis underpinned by critical hermeneutics from educational policy proposals, research findings, and analytical philosophy. After analyzing the context, the person, and the learning needs, we offered a clearer idea of the universities 4.0, where the 'learning to learn' meta-competence appears to be a key factor for working and living well. This meta-competence may lead to enable human optimization and overcome human obsolescence in a way in which people be increasingly valuable to invest their values in their communities. This paper includes some guidelines for Higher Education institutions to enhance organization and curriculum, according to the new model of society and the human conditions. The ideal of well-being, of what is better or convenient, is left to a necessarily subjective discussion, although not lacking in reasoned criteria for each moment and circumstance.

*Key words:* learning to learn; Higher Education; competence; knowledge; industry; human development; social change.

## RESUMEN

La 4.<sup>a</sup> Revolución Industrial ha transformado el modelo de sociedad a escala global. El cambio a corto plazo se ha apoderado de la vida cotidiana y las personas que no lo afrontan terminan por quedarse obsoletas. En este escenario la vida y el trabajo de los graduados universitarios se ha vuelto inestable a medida que su futuro próximo ha crecido en incertidumbre. Por ello, nuestro objetivo fue arrojar algo de luz sobre las vías de optimización humana desde la educación superior, considerando la sociedad y la economía basadas en el conocimiento, que hicieron posible una nueva industria. En esta línea, realizamos un análisis sustentado en la hermenéutica crítica a partir de las políticas educativas, los resultados de la investigación y la filosofía analítica. Tras analizar el contexto, a la persona y sus necesidades de aprendizaje, se ofrece una idea más clara de las universidades 4.0, donde la meta-competencia «aprender a aprender» parece ser un factor clave para trabajar y vivir bien. Esta meta-competencia alberga la posibilidad de favorecer la optimización del ser humano, llevándolo a superar su obsolescencia, de manera que las personas sean cada vez más valiosas para invertir sus valores en las comunidades que habitan. Este documento recoge algunas propuestas para que las instituciones de educación superior mejoren su organización y sus planes de estudio, de acuerdo con el nuevo modelo de sociedad y las condiciones humanas. El ideal de bienestar, de lo que es bueno o conveniente, se deja para una discusión necesariamente subjetiva, aunque no carente de criterios razonados para cada momento y circunstancia.

*Palabras clave:* aprender a aprender; educación superior; competencia; conocimiento; industria; desarrollo humano; cambio social.

## 1. INTRODUCTION

The 4<sup>th</sup> Industrial Revolution (4IR) has modified the model of society and, consequently, there is a new trend for 'being' human. The life and work of the university graduates became fickle since their near future grows in uncertainty. For that, Higher Education systems should offer as satisfactory an answer as possible to meet the demands of the Industry 4.0, on which several questions arise. In this paper, we argue the educational implications to reflect on new human conditions and clarify them, something relevant insofar as education entails human optimization. After the educational action, we assume the learners will be more valuable, and universities are called to offer an educational action of great significance for people to acquire and invest a cherished value into the community. Nevertheless, however 'valuable' or 'good' a person may be, there will not be provided an essentialist viewpoint about human condition here. In this line, we aimed to shed light on human optimization pathways in the contingency of Higher Education in the knowledge-based society and economy, which made possible the 4IR.

We conducted an analysis underpinned by critical hermeneutics from educational policy proposals, research findings, and analytical philosophy. Delving into key terms and significant results made it possible to clarify human optimization pathways in the 4IR context. In this matter, supranational organizations, such as the OECD or the European Union, suggested the 'learning to learn' competence (LTL) as a need for living well in today's communities. Now then, there are reasons to conceive it not exactly as competence but as a meta-competence, thus, with ethical implications to develop life projects for people to live as well as possible. This is all the more cause why advocating the successful incorporation of LTL in Higher Education. In the 4IR, this means turning traditional institutions into universities 4.0, ready for training towards current living conditions. Only thereby, people will employ their innovative learning to benefit others and themselves for reaching more humanized communities.

## 2. THE INDUSTRY 4.0

### 2.1. *Looking for short-term knowledge*

The 4IR entails a constant flow of massive information. Each data input triggers reworking the knowledge available at a given moment incorporating new information and updating the previous cognitive status, which becomes obsolete to a certain extent. In fact, cutting-edge studies are still considering how education systems cope with this short-term change (Demartini & Benussi, 2017; Säfström, 2018); and it is striking, for the knowledge-based society and economy were recognized a challenge in March 2000 at the European Council in Lisbon, almost 20 years ago.

The Organization of American States also recognized a new model of human 'being' based on knowledge, at least since the Declaration of Santo Domingo, adopted at the fourth plenary session, held on June 6<sup>th</sup>, 2006. Not only that but in the last years, there seems to be a global interest to exchange new findings as evident after the Unitwin/Unesco Chairs Program to strengthen RD agreements at the international level. Interest in knowledge matches the Industry 4.0 withal. Where the Industry is more developed, the percentage of GDP is usually greater. According to the World Bank, in 2017, the United States invested 2.8 % of GDP in research and development, Germany did 3 %, and Japan 3.2 %. So, here are at least two questions: [1<sup>st</sup>] why education systems would not be training for knowledge-based contexts?, and if trying, [2<sup>nd</sup>] why training appears not to be working at the sight of the latest research?<sup>2</sup>

At present, immediacy governs the communities of the 4IR, they are liquid (Bauman, 2000), flexible (Sennett, 2007), or simply unstable. Education systems should thus train flexible citizens who resist change and chaos, handily adapting to new scenarios rather than expecting routine. It does not mean the cult of immediacy but updating short-term knowledge and even influencing the generation of new knowledge in streaming. All people would benefit most if specialized learning was a common good, as stated since 1998 when Unesco celebrated the World Conference on Higher Education in Paris. Where knowledge was a common good, probably the engine of the economy of a given region would be injected with the harnessed talent of more people. The short-term change brought about by the 4IR gives a small twist to all of this, but that twist has far-reaching implications for the model of people trained in universities. Ever-changing societies require either educational institutions that permanently train and update many people —something frankly difficult to put into practice— or educational institutions where people learn to train themselves for becoming independent of the institutions. That has serious implications for employability and several interests are at stake, so going deeper into the field of work could be clarifying.

2. Before carrying out, please consider that human development is the main object of this work. Therefore, it is not possible to avoid the use of the word 'training' and its semantic variations. Other English words such as 'preparation', 'guidance', 'instruction' or 'qualification' offer similar meanings, but what is intended to be expressed does not only refer to teaching someone for facing something later. The idea to be expressed has more to do with the Latin root '*formare*', which remains in other languages, i.e. Italian (*formazione*), Spanish (*formación*), Portuguese (*formação*) or French (*formation*), with the original meaning: someone developing so that he/she be in a way that is his/herself own, but which has not manifested yet in him/her. The English word 'formation' seems to be related to creation or building of something more than to human development, so 'training' will be used instead of 'formation' to make the text more readable from an education usage. All the same, when using 'training', be meaning someone's development as an end beyond meeting immediate objectives.

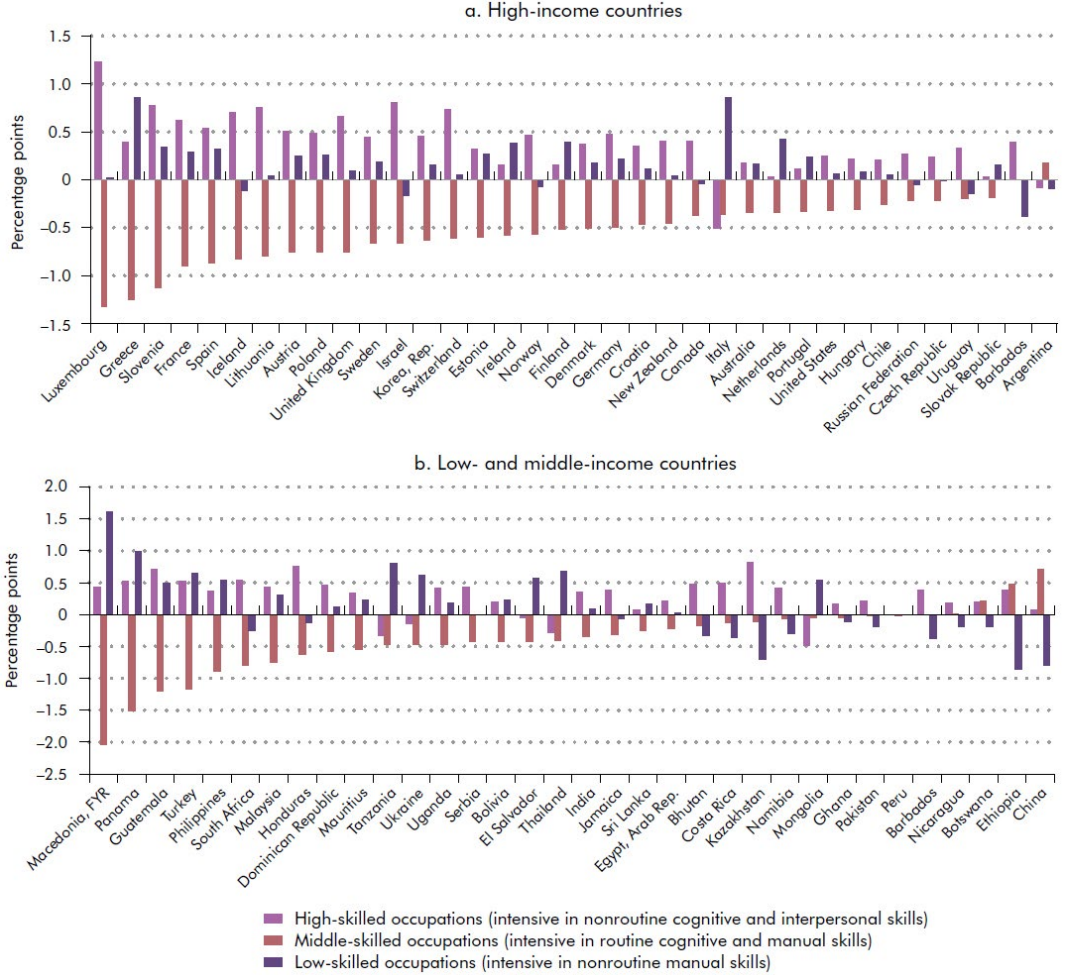
## 2.2. *Employability and social polarity risk*

The French Revolution and the 1st Industry contributed to employment liberalization and the right to education, but education systems were bound to work conditions until today. This link appears to be evident when looking to European references of modern pedagogy, where revolutions began, i.e. farming schools of Pestalozzi; and even contemporary, such as Freinet's *pédagogie du travail*. Indeed, employability increased with steam engines and electricity during the early industries, given the demand for labor in the factories. Specialized, repetitive work was required and, with the advent of computers in the 3rd Industry, someone had to manage large amounts of data. Logically, education systems began to promote specialized, repetitive, and rote learning, thinking on the labor market. Nowadays, Higher and Vocational Education are the most specialized labor-connected levels of the system.

In this context, the middle class increased significantly in most of the world during the 80s and 90s, but it eroded during the past decade (Vaughan-Whitehead, 2016). The middle class gave greater social mobility, acting as a bridge, especially after the first industrial revolutions. Despite this, the type of employment in the 4IR is provoking a decrease in the middle class and, therefore, hindering social mobility. According to the last OECD (2017) reports, new technologies are changing the nature of work and medium-routine occupations have dropped 9.2 points in Europe between 2002-2014.

In the current Industry, machines do much better when it comes to repeat specialized processes and manage data. Moreover, machines neither earn a wage, nor rest, so they are more cost-efficient for boosting economic profit margins. For this reason, middle-class employment seems hoarded by new technology, and high- and low-skilled jobs have grown as middle-skilled jobs have decreased sharply almost all around the globe (Figure 1). The reduction of the middle class gives not only risk for social mobility, but the distribution and increase of risk assure social inequality (Beck, 1992) as well as polarity and distrust in markets and governments (Giddens, 1990). In this matter, there is another point: [3<sup>rd</sup>] what training could maintain a bridge for social mobility, be it the middle class or an alternative? In this regard, Higher Education and Vocational Education and Training are of greater concern to us due to their effect in the labor market.

FIGURE 1  
Global labor market polarization



Source: The World Bank, 2016

2.3. A training according to education for life

Artificial intelligence could be replacing the middle class, which covered most of the middle-skilled jobs. People who graduate after Vocational Education and Training and the first level of Higher Education are those who generally fill these jobs.

In this sector, certain scholars highlight ‘precarious’ (Kalleberg, 2009) and ‘flexible’ work (Hardt & Negri, 2004) in contrast to ‘decent’ and ‘regular’ work (International Labour Organization, 2012). Whether work be flexible or regular, work it is; but ‘decent’ refers directly to the person who works and his or her context, as ‘*decens*, *decentis*’, from Latin, means ‘suitable’. We can suppose that if it is not decent, it is not adequate; and if it is not adequate, it is not decent. In other words, it is indecent employment because it does not fit the worker, his or her context, or both.

When using the term ‘adequate’, we are referring to suitable for people to meet their fundamental needs and be able to develop as human beings. The term ‘decent’ encompasses this idea to qualify a human being, whose behavior would be adequate to develop as such a human being. Thence, the ‘decent’ work contributes to people to develop that way as ‘decent’ means suitable for human development.

Could we not assume the same about training in universities, as the structural conception of modern and current education systems is linked to the labor market? If so and in response to the 2<sup>nd</sup> point ‘why training appears not to be working?’, probably it is not because it may not be a ‘decent’ training, it may not be suitable to people and their context. In consequence, to answer to the 1<sup>st</sup> question ‘why education systems would not be training for knowledge-based contexts?’, we could think they are not because they are inadequate for people and, thus, for the context where they live. This is interesting because people do not only labor in that contingent context, but they work in another sense; they function, they live in there and they do it all the time. Under this situation, Higher Education systems should provide decent training for long-term and livable —life-long— human development. That is, an education for life, not only for employability, even if it is Higher Education that tries to meet the demands of the labor market.

All of the above leads to a different scenario concerning the previous one and incites us to wonder about what should be the training the universities offer to those who are going to inhabit the social and economic contexts of the 4IR. Reflecting on the human conditions of these people is unavoidable to behold what their training should be and in what sense and why it should be so. That will help to ponder on a situated human optimization in the line that a human being becomes more valuable while learning. Therefore, the next head deals with the human conditions of people living in the 4<sup>th</sup> Industry.

### 3. HUMAN CONDITIONS

The human who lives in the 4IR is cognitive, but also social. Short-term change imposes as an imperative against an apparently ordered cosmos, and in that circumstance, technological advances allow access to information and network connectivity on an almost global scale. In the digital age, online communities made way for open

social systems, such as those conceived by Von Bertalanffy (1968). Nowadays, to understand the educational needs of the people in the 4IR, it is necessary to know the principles of complexity to grasp a sort of cognitive, social, and complex human; who performs specialized and multifaceted learning.

### 3.1. *Socio-digital density and complex systems*

In the 20th century, the routine made peoples' life more predictable. Anybody used to know what to do for getting a job promotion, employment used to be more stable, and people used to plan even the moment when having a house on the property. That was apparently ordered. 'Apparently', because a set of components that constitute an order could be reordered in some other way. This rearrangement occurs constantly in the 4IR, in an 'apparent' disorder, which constitutes a sequence of several unstable orders, overlapped in short periods of time.

All through history, predicting the future [the order] has been the most exciting, uncertain, and sometimes well-paying professional practice. In a world of dizzying changes, where any foresight is soon overcome, it is an adventure with an uncertain result. (Marín Ibáñez, 1999, p. 16).

In effect, machines predict better than people, besides other advantages for the labor market mentioned above, and that has an impact on the order of social systems where people try to realize a life project.

A system is defined as an interrelated set of elements (Von Bertalanffy, 1968). In social systems, elements may be people, so that the elements of a social system can hardly predict the future of their system compared to those systems where the elements are machines. Regardless of this, social systems are potentially dense because of their connectivity. From the theory of the Social Network Analysis, density is expressed by the number of elements that are connected, divided by the potential connections in a network; being potential connections equal to  $n(n-1)/2$  for undirected links and  $n(n-1)$  for directed links, where  $n$  is the size of people in the network. In the first case, connections are bidirectional, and in the second, they are unidirectional. A network like this would make a social system as long as its elements are people.

It does not matter whether the interaction in the social system is unidirectional or bidirectional. This means that in some cases, there are some active people, and others remain inactive. If connections are unidirectional, some people interact with others, without others interacting with them. A good example may be a person who sends an email to apply for a job, and no one replies to the email. Even so, social systems have a potential density of one hundred percent and could reach it. That

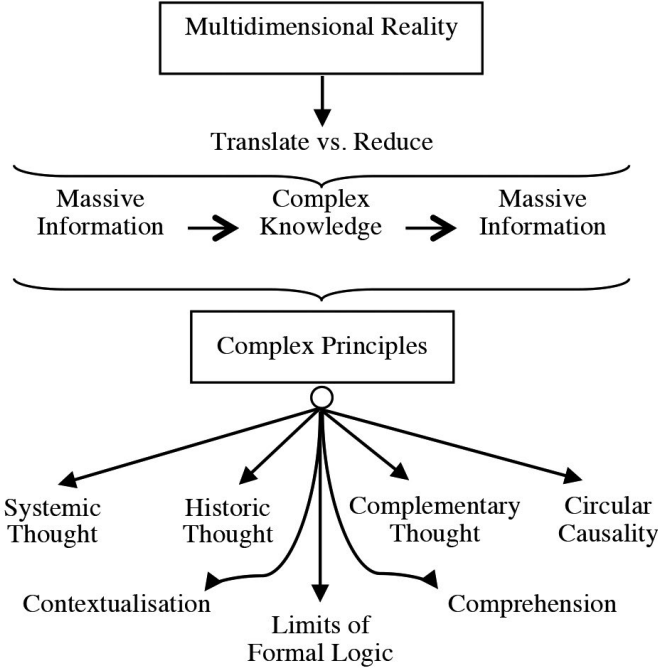


is, social systems are very potentially connected and are capable of reaching levels of density as high as machine systems, despite intra-systemic autonomy to predict the future of their system. Thereby, the flow of data could be shared by all people within that social system, expanding to one hundred percent the possibilities of access to information in streaming. Now, digital skills are very relevant in the 4IR because in digital social systems this is not just theory, but it becomes reality as we are talking about potential connections, and in virtual contexts, the connections between people are real.

Digital resources allow an individual to connect with any other individual in the world—only people in an online community—to engage in common projects with shared leadership or to include that person in their life project. These initiatives can be highly innovative, so it is not only relevant to learn digital skills but also entrepreneurial, both for-profit and non-profit. Digitization influences up to 98 % of the United States economy and has a great impact on the world economy as well (Phillips, Yu, Hameed, & El Akhdary, 2017). Those who do not learn digital skills run the risk of being left out of the system, not only in economic activity but also in social access in several senses.

The social systems of the 4IR are complex. They are networks of heterogeneous and inseparably associated elements, living in 'disordered', ambiguous, uncertain, and contradictory contexts. Therefore, their realities cannot be understood in a one-dimensional way by means of disjunction, reduction, or abstraction of the phenomenal world in which these people develop. If there is not a unique possible reality, there will be not a unique possible future, and that means that everyone could influence the future of a social system while living in it. As previously said, the 4IR 'entails a constant flow of massive information', so one way for a person to influence the future could well be to produce knowledge and make it part of the available data. Perhaps we cannot predict our future, but sure enough, we can decide what future we want for tomorrow. This requires understanding complex social systems, translating with complex principles (Morin, 1990) their multidimensional reality, some of which are slightly mentioned in this paper (Figure 2). That is, i.e., to understand the contextualized reality and to infer a judgment about it, the conditional probability for this inference to happen should be considered similar to the Bayes' Theorem for taking into account the conjunction of different realities or different perspectives of the systemic reality. In short, several factors condition the probability of a person learning something. In the 4IR, one of these insights may be anyone's due to access to information, if the person can access.

FIGURE 2  
Complex principles in social systems



3.2. Peoples' responsibility in the work of the future

Education implies human optimization and in the 4IR, optimization entails updating short term knowledge. Human beings cannot linger outside the context in which they develop, so the context must be 'decent' for them to allow their development. The person must adapt to the context to develop fully and successfully. Then and not before, it is possible to generate knowledge and influence. Otherwise, the limitations derived from the relationship between people's actions and the barriers of the context where they take place would reduce the possibilities for human development (Garcia-Garcia, López-Torrijo, & Gozávez, 2019). It does not matter whether a person has valuable knowledge to offer to his or her community. Insofar as that person does not manage digital skills, he or she will surely not have access to others as much as possible. Therefore, the influence of this interesting knowledge will reduce to the detriment of the entire community. That is why universities should provide training to promote social inclusion using technical learning, though not only technical.

It is relevant to recognize oneself in context and to give a 'response' —responsibility— freely, in the direction of freedom as capabilities (Nussbaum, 2009; Sen, 1999), and of freedom as association to acquire influential power in the change of social events (Arendt, 1998; Dewey, 2002). This leads people to develop into common projects, only joining and sharing since isolation seems to be alien to the context of the 4IR, for people are or can be interconnected at the highest level of density.

In view of the above, a decent Higher Education, in this case, should go beyond work (τέχνη) and contribute to the development of people capable to influence the future of the social systems they inhabit, generating autopoietic social systems (Luhman, 1986; Seidl, 2016) (ποιέω). This means being autonomous to process, transform, and regenerate the flows of information in the knowledge-based societies and economies. This may allow people to 'work' —function— autonomously on common projects, in an increasingly humanized context.

As regards the term 'work', it should be made clear that its technical meaning is not its only attribute and there are other interpretations. While this is the meaning given to it by authors such as Arendt and offered in the Aristotelian 'poiesis', the term 'work' can also be understood in a different sense. From the Hegelian-Marxist tradition, work is understood as a key activity in the training process of people, since it is an activity that transforms the world and the transforming subject. Thus, people do not always work for material retribution, but can work for moral retribution, without deviating from the benefits of work to develop as a human being.

As people do not know what their future will be, they do not know what the 'work' will be in their future, and it is not possible to think about training for a 'work' that is not yet known. It is not possible to do it, but it is necessary working for living in the 4IR, so people must answer the problem of not knowing the 'work' of their future. Moreover, if they want to live and live well (ευβιος), they cannot remain unaware of short-term changes and should 'respond' to these circumstances in a context that places responsibility on the individual (Garcia-Garcia & Pérez-Pérez, 2019). Here there is a difference between living well because the resources of an individual let so and living well due to people live in accordance with values and rules the community accepted as 'good' or 'valid'. The last sense is that of ευβιος and is what we are referring.

If people are afraid to take charge of their life projects, waiting for others to take responsibility for the course of their future, they would be afraid to employ their freedom (Fromm, 1984). If they achieved that purpose, they would live a heteronomous life in the radical sense (έτερος, νόμος); they would be renouncing to decide the norms or criteria to live their own life and live it well or in the best possible conditions. Therefore, the people of the 4IR must decide what they want to contribute to the social systems they inhabit in the future and must act in such a way as to influence the realization of these 'works' —in the Hegelian-Marxist meaning—; and this within the systems, not outside them.

### 3.3. *Human obsolescence and learning*

At this point, we could coincide with Ortega y Gasset (1966), «I am I and my circumstance; and if I do not save it, I do not save myself.» (p. 322). People's reality is concrete and unfinished, so they carry out life projects for the future, facing their circumstances, which 'conditions' them. This differentiates people from things, which are finished. If people do not 'save' their circumstances, they become obsolete in the Latin sense of the term (*obsoletus*); they become inadequate to cope with their circumstances. Consequently, obsolescence could affect people's 'decent' life and hamper a good life due to the lack of suitability between the person and his or her context. In this way, people learn something and in a short time, if they do not recycle and relearn it, they have a harder adaptation. The cellphone is an example: social pressure incites to communicate through the cellphone, including its latest updates, so people need to learn this channel. More than that, scholars have analyzed in recent years the need for learning key competences to participate in the interactive public opinion (Gozálvez, Romero-Rodríguez, & Larrea-Oña, 2019) under the use of networks such as Twitter or Facebook.

It seems the middle class is getting obsolete in the labor market. Returning to the 3<sup>rd</sup> question, 'what training could maintain a bridge for social mobility?', this training would not be that of a declining middle class. This training should make people more valuable to bring such value to the social systems they inhabit. Here we could also coincide with the categorical Kantian imperative, considering the person as an end itself (Kant, 1996), since the value of people is not only a value of change for the individual, but it is a value that helps to generate autopoietic social systems. That means, after Higher Education, it is not only important to 'produce' tangible goods and services that can be exchanged for material retribution —though that is relevant for living in capitalist systems, such as the 4IR—. The goods and services must revert to the benefit of the whole system and improve it, thereby improving people's living conditions. This requires knowing how to learn and it is not short-term but stable knowledge. So, this training should encourage people for 'learning to learn' (LTL) to face the short-term circumstances of the 4IR to achieve a good life; good, because being valuable and, thus, desirable for people who share the same social systems.

## 4. LEARNING TO LEARN

Since the last decade, competency-based education has grown in importance for universities (Echols, Neely, & Dusick, 2018; Gargallo López, 2017). The time-based curriculum became obsolete for the outcome needs in today's Higher Education, and the programs where students show skills and knowledge appear to be more suitable (Kelly & Columbus, 2016). Motivated by these needs in educational institutions, Europe proposed an initiative, inspired by the OECD's DeSeCo Project about learning

key competences. The proposal aimed to improve not only university programs. However, at any rate it was of great interest to the European Higher Education Area. In 2006, the European Commission proposed eight key competences to meet the challenges of the future in the 4IR, and they were reformulated recently (European Union, 2018). Perhaps they were because they have not worked as expected or could not be incorporated into the education systems. Either way, the only one of these competences that impacts all the others is LTL.

Certainly, training people for adjusting their learning process to their needs at any given moment sounds quite promising. Regrettably, there seems not to be an agreement about what is exactly LTL, taking into account that the last textbooks show several author chapters where provide different versions of it (Deakin Crick, Stringher, & Ren, 2014). Besides, in the European proposal, it would be about learning a competence, so lead to wonder on the limitations of competences. Those limitations will be one of the objects of this fourth heading to think about the sense of universities to train people. Furthermore, be the contents that define LTL left to other papers (Gargallo López, Pérez-Pérez, Garcia-Garcia, Giménez Beut, & Portillo Poblador, 2020) because we do not aim here to solve the disagreement of the academic community.

#### 4.1. *Competence and meta-competence: a matter of ends*

Competences require knowing a task situated in a context and the disposition for conducting it. That means both theoretical and processual knowledge, and a positive attitude to use them properly. In this regard, as long as there is one scenario to execute the competence and it is in part a process linked to that scenario, there is a specific objective, similar to those objectives that could operate in systems where elements are machines. Thereby, anyone who is competent in reading comprehension is expected to decode and understand the text. Similarly, one who is competent in written expression may be able to code phonemes and to express oneself; and so on. Even if competencies are bound to meet specific objectives in a context, it is difficult to justify them as an end themselves or to justify that they are end-oriented, beyond the objectives assumed for each competence. There is no 'directive end' as defined by Aristotle (2015) in his ethics treaties, for the competences can always be a means to achieve something: an objective or perhaps an end, which were directed by other ends. That is, i.e., a person who is competent in reading comprehension understands a text, but could do so to learn something, beyond understanding the text.

To this point of the paper, there is a difference between meeting objectives (*finis quo*) and those values which are at stake when someone does something (*finis qui*) (Ferrater Mora, 1979). Regardless of the objectives, it is worth noting the difference between values-principle and values-end (Yurén, 1995). Though a value-end would

be the reason or justification for doing something, it is not necessarily a directive end and it will be never a specialized objective.

While specialization appears to be a work more suitable for machines, free decision-making for sharing ends may be more 'decent' for people. This reason invites us to think that training for the 4IR should transcend competences, though it should include them too. However, when considering why LTL, there is indeed an end and a 'directive end'. We propose this directive end is the person's constant improvement to live as well as possible with his or her circumstances.

That is why LTL is a meta-competence and not just another competence. It is not, because LTL is beyond meeting specific aims towards critical thinking for people to influence the short-term change inside a social system. This does not imply the use of specialized learning is not 'decent' for human beings. This entails that human beings, unlike machines, can and must decide the course of their learning, which becomes more complex and specialized as people learn more and more. In order to make decisions about one's new learning, it is essential to know how to learn. Universities that train people for the 4IR would do well not to limit themselves to specialized learning in certain disciplines, but to teach students how to make decisions about their learning process and goals in the future. These 'universities 4.0' would be training people to cope with and influence in the 4IR, based on knowledge and short-term change.

#### 4.2. *Learning to learn for working and living well*

People cannot be competent in LTL without critical thinking because they learn in a system and need to recognize themselves and interpret such a system not to becoming obsolete. In fact, they would become obsolete respect to their circumstances inside the system, so LTL for living well —or at least as well as possible— with their circumstances inside the system implies adapting to short-term change, but also to change part of —participate, affect— the order of the system.

The LTL meta-competence is thought to enhance personal development, not only to learn a common skillset (Rawson, 2000). People who are competent in LTL, are expected to be autonomous and effective along their own learning process (Gargallo, Campos, & Almerich, 2016) to 'work' well. In the same vein, learning a meta-competence appears to be closely related to human development towards a certain end in the sense of values-end. To the extent that capabilities are an end itself —see capabilities approach (Nussbaum, 2009)—, incorporating the LTL meta-competence in the training programs at university for living in the 4IR is not inter-exclusive with people to develop their capabilities, as stated in the handbooks about this matter (Ibáñez-Martín & Fuentes, 2017). In this line, an end in view of which LTL was for human optimization may lead to another directive end: living well (*εὐβίος*) with one contingent circumstance, in this case, in the framework of the 4IR. That is what universities 4.0 would incorporate in their educational programs.

### 4.3. *Continue learning after Higher Education*

Here, we take the philosophy of learning shared by the 48 countries of the European Higher Education Area as a reference. It involves a semi-Asian and European, but in any case, international scope. Consequently, some academics' reproval of the Bologna Process for the convergence of Higher Education in these countries may serve to understand universities 4.0. The criticism often directs to the strategies for employability and the commodification of Higher Education systems (Rikap, 2017). The private interests of agencies with high financial power seem to have strongly influenced Higher Education reforms, probably since the 1960s. This has been perceived as an attack on popular sovereignty and the democratization of decisions about Higher Education issues (Tavares & Sin, 2018).

If these statements are true, resentment of democratic values, such as freedom, equality and justice, would have a negative influence on employment growth. Employment in the 4IR is about exchanging knowledge and skills for capital, and knowledge and skill development depends on autonomous learning. Considering that all learning usually depends on the learner, we could assume that learning requires a certain degree of autonomy; no longer only to carry out life projects, but to learn what is necessary to establish a personal project during a period of life. Without democratic values, it is difficult to conceive of such autonomy.

On the other hand, we think the drawbacks are more directed to the means of achieving greater employability than to the goal itself of increasing the number of people employed. After all, it could be accepted that a person's employment is essential to his or her livelihood. Assuming this, the goal of increasing the number of people in employment would be laudable for individuals and even desirable for the whole community, since the economic growth of all its inhabitants would depend on the employment taxes to some extent. In the case of those who studied at the university, the value they acquired during their studies consists of what they learned, and that is what they can bring to the benefit of their community. If this is not what they invest in the social systems where they live, they would have studied for another reason such as knowledge for knowledge's sake or motivated by other more profitable values for personal benefit. Even more, it is not only a matter of pouring something valuable into communities — 'work' therein — but of living and surviving in them. Remember that the 4IR communities are mostly capitalist, so it is necessary to acquire an exchange value in the Higher Education institutions to employ it — 'labor' — in a valuable way for the improvement of the community. Higher Education institutions should contribute to revalue work —in the sense of Arendt— as an activity that is not a commodity or an exchange value, but a waste of energy to create living conditions that contribute to the development of community members.

Thus, universities that do not offer a learning-based value for exchange do not contribute to carry out one's life projects and ultimately to living a 'good' life.

Oppositely, universities 4.0 would provide specialized training to increase the autonomy of people and make them carry out their own life projects and decide which are the most desirable goals for their life.

## 5. CONCLUSION

After analyzing the context, the person, and the learning needs, we can offer a clearer idea of the universities 4.0. These would be institutions where teaching programs favor constructivist learning environments. This fosters the students to learn generic skills, such as decision-making, creative thinking, and problem-solving (Virtanen & Tynjälä, 2019), all of which is basic for developing the LTL meta-competence (Gargallo López *et al.*, 2020).

Institutions may promote teaching methods to improve learning environments. Service-Learning, in particular, helps students to learn through projects attached to real contexts and stimulates reflection and awareness from experience in a field of work (Sotelino Losada, Santos Rego, & Lorenzo Moledo, 2016). Reality is built and students must learn to construct and influence it. This is not hard constructivism (Waltzlawick, 1985), according to which all experiences are subjective and there is no way of knowing the reality perceived by a given person. It is rather moderate constructivism, admitting the existence of objective realities in the 4IR. People can build knowledge about their phenomenal world, about their circumstances, and this knowledge arises from individual perception and from negotiation with others in such a way that it is possible to approach objective realities to a certain extent. Students learn the procedures for negotiating realities and deciding on a course of action—influence—in their communities with methods such as Service-Learning.

Teaching programs also depend strongly on those who teach and not only on institutions, since methods do not always require connection with businesses or members of civil society. There are many learning-centered (Gargallo López, 2017) and technology-based methods available (Ellahi, Ali Khan, & Shah, 2019), such as question-based or project-based learning, or even case-based learning with augmented reality. However, the successful development of the LTL meta-competence does not always depend on the teaching method. Flipped classrooms, i.e., work well to enhance self-regulated learning, once students already know how to self-regulate (Sun, Xie, & Anderman, 2018), and this is part of LTL. Recent studies, in contrast, show no significant differences between flipped classrooms and traditional methods for developing LTL (Espada, Navia, Rocu, & Gómez-López, 2020), at least in Higher Education.

We believe that it is not only the learning environment that helps to develop LTL but also the learning process that students experience. After all, recent studies report two fundamental boundaries in the curriculum design of the LTL meta-competence. One is the need for an operational and comprehensive definition for teaching its contents—learning environment—and the other is the assessment of



learning outcomes (García-García, Yurén, López-Francés, 2019). The results come from the environment where students learn and from their learning process, and the process does not take place only in the environment prepared by professors but also in community spheres outside the universities or in more personal and informal settings. Universities 4.0 must consider these other non-university environments to offer in them the support materials that contribute to the development of learning and meta-learning with autonomy. Project-based learning is an example in this line since it fosters students' autonomy, constructive research, goal-setting, collaboration, communication, and reflection within real-world practices (Kokotsaki, Menzies, & Wiggins, 2016).

Still, learning depends essentially on the learner, even if professors provide learning environments and institutions endorse them. Students who learn how to learn break away from institutional dependence to update their knowledge, adapt to the social systems of the 4IR and influence their communities through 'work'. Ultimately, the universities 4.0 would be institutions that bring their professors to act as guides and moderators of the students' learning process. Within this teacher-student relationship, there is a circular causality (see Figure 2), and universities should ensure that everyone is aware of this educational scenario. Does the student learn because the professor teaches, or the professor teaches because the student learns? We know that the learning process takes place independently of the teaching process —LTL—, but the teaching process conditions the learning process too. In a university 4.0, it would not be coherent to stop and think about these kinds of questions because there would be an awareness of the circular causality of learning and of the independence of the learning process itself. There would be an awareness of the existence of different factors that affect learning; that is, of complementary, systemic thinking, and other complex principles that apply to the phenomenon of learning.

The universities 4.0 would reveal to students the value of learning by oneself to live well in the communities they are going to inhabit in the near future. If learning makes sense to the learner, then learning is conscious (Wall & Hall, 2016); and if it is conscious, we could suppose the student is willing to learn what he or she is learning, as suggested in recent works by the University of Bristol (Deakin Crick, Stringher & Ren, 2014). When people want to learn something because it makes sense, learning is significant, useful, and valuable.

In universities 4.0, professors would measure accurately the acquisition and development of knowledge and skills that allow to keep learning, once the studies are completed. The assessment would not be carried out by means of perceptual tests with few items (Muñoz-San Roque, Martín-Alonso, Prieto-Navarro, & Urosa-Sanz, 2016). The tests would evaluate high-impact practices associated with the students' outcomes (Zilvinskis, 2019), following competency-based education (Gargallo López, 2017; Echols, Neely, & Dusick, 2018). Higher Education institutions are changing

as a result of the 4IR, and the generation we knew as 'post-industrial' became a 'cognitive' generation (Lapteva & Efimov, 2016), whose meta-learning is one of its few stable characteristics to cope with short-term change.

Further, the programs would not only connect students with relevant companies in the employment sector that is most fitted to their training profile (Winanti, Gaol, Napitupulu, Soeparno, & Trisetyarso, 2018). Something similar is usual practice during the periods of outside internships, but the universities 4.0 would also track the students' entrepreneurial activities, both for-profit and non-profit, and always for the benefit of the communities beyond markets. This should serve to leverage public spending on Higher Education institutions. Seeking to benefit the communities through the training and research of university graduates contributes to the universities' third mission (Santos-Rego, Lorenzo, & Sotelino, 2017), which also has been tried to measure for a controlled follow-up (Secundo, Perez, Martinaitis, & Leitner, 2017). That opens the door to train autonomous people whose exercise of citizenship improves effectively the communities where they live with others.

At least a couple of conclusions could be drawn from this paper, one on the university training requirements for the 4IR and the other on the end of such training. Both conclusions coincide with the idea of 'decency' and, then, in the suitability of this training to the people and the contingent contexts or social systems in which they live. The training of the universities in the 4IR should bring in the LTL meta-competence to enable human optimization and overcome human obsolescence in a way in which people be increasingly valuable and able to invest their values for living well in community. In a life of 'dizzying changes', only people-centered education will make a difference in improving their lives and communities.

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