

# Higher education: mercantilism, citizenship formation and interdisciplinarity

## Abstract

This text was written based on the current importance of higher education, with a universal view and from an epistemological perspective focused on the relationships between what is and what should be. It was carried out with the objective of helping to counteract mercantilism in higher education and the positivist theoretical positions that serve as its theoretical support. Consequently, it is made up of reflections on these topics and, at the same time, of theoretical elaborations around citizen education, complex thinking and interdisciplinarity because they are fields where there are ways and means to advance in achieving the objective. The inclusion of the humanities in the deployment of interdisciplinarity between disciplines of other types is emphasized. This study was carried out through classic bibliographic research and with the use of a varied bibliography, but that responds to the topic discussed, which, for the most part, is recently published.

**Keywords:** mercantilism, citizenship formation, interdisciplinary, positivism, complex thinking

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## Introduction

Historically, society and culture have determined the tasks of higher education, the way in which they must be carried out, the trends that must follow, the goals that must be achieved, but, although this relationship exists, currently it is more than the opposite, because higher education has an increasingly greater value for society and culture, among other causes, because it directly influences the development and characteristics of the latter.

The university is vital for the development of any country. Governments that carefully attend to higher education and the teachers who carry out and carry it out are intelligent. Today it is increasingly difficult to find social and cultural facts totally unrelated to it. The previous statement is due to the growing presence of the complex system formed by graduates and scientific, technological, artistic results, among many more, that encompass the various manifestations of life, especially human life. In the latter, the influence of said system becomes evident in reasoning, in feelings, but also in participation in society and culture.

Historically, the Higher Education has moved between trends. The authors Wee & Monarca<sup>1</sup> state the following: Higher Education today is moving between two trends, the democratizing trends and another, according to which the Higher Education is conceived according to the laws of the Market and trade. In Spanish this trend is often referred to “mercantilización” of Higher Education, because Higher Education is looked at from a market perspective and seen as just another market issue.

The “mercantilización” (commercially) of higher education is basically due to the forces of economic power, especially in countries with a more developed economy and society, which conceive higher education as another commodity and thus take it to the market, where it is suitable for be sold to consumers. For this reason it must be subordinated to both the market and the banks. This model has been imposed in many countries through various mechanisms: the privatization of higher education institutions, competition, and, among others, the inclusion in the academic world of purely business

language and commercial logic. The diversity, breadth and depth of higher education must be subordinated to the objective of producing professionals who are competent to function in business relationships, which are increasingly more complex.

In the university governed by the market, professors, students and workers in general become just another object to sell and buy. In this way, the human being comes to be seen as a commercial thing that must provide some metallic profit and the purpose of human improvement inherent to education at all its levels is relegated to the background.

Oppositions of various kinds appear against the mercantilist tendency, some taking shape based on the development of science and technology, especially based on the influence that each of them has on the university. Other opposition manifestations are based on the sociocultural transformations of these times or on theories of different kinds, above all those related to knowledge, science and technology, not only pedagogical, psychological or sociological ones, but also philosophical ones and within these, those of ethics, aesthetics and epistemology. It is worth highlighting the epistemological changes that have occurred since the end of the last century, which are manifested, above all, in the relationship with knowledge, particularly with scientific knowledge, specifically in the deployment towards them of a new perspective and a new perspective sensitivity.

There are strong links between epistemological positions and professions, which cover professional training in its entirety, including the conception of it and the characteristics that a professional should have. The current epistemological changes invite special attention to citizen formation.

The aforementioned attention corresponds not only to the epistemological changes and current social and cultural transformations that accentuate the importance of paying more attention to citizen education, but are also due to the critical spirit prevailing in these times, which stimulates reinterpretations and the rethinks. Thus, with the aim of giving new readings, the subject is studied, the purposes that are had with it and how to achieve it.

In epistemological changes, the transition from positivist philosophical-epistemological positions to others is important, among them, those of complex thought, from which a series of arguments that show potential to counteract mercantilism and its effects take shape. One of the mercantilist manifestations where the presence of positivism is strong is in the contempt for the humanities. Such dismissal is due, above all, to the fact that they are seen as unprofitable, although the problem has, at the same time, another cause and that is that they are seen as inferior studies, which do not reach the high level of science.

The intention to counteract mercantilism in higher education can be carried out in many ways, including the conscious overcoming of extreme positivist positions and the inclusion of the humanities in the deployment of interdisciplinarity between non-humanities disciplines. With this inclusion, these sciences are brought closer to the human being and the human presence in them is strengthened, which also gives a different nuance to the interdisciplinarity between non-humanistic sciences. It is worth emphasizing that the latter, that is, the non-humanistic sciences, exist as a function of the human being and that the human presence in them does not have to undermine their quality, on the contrary, it can elevate it.

The interdisciplinarity category is of epistemological and methodological origin; it is used to refer to the process of opening and diversifying relationships between sciences or between disciplines that are part of a specific science. In each case, the primary thing is the openness between them Guzón<sup>2</sup> but the most important thing is the relationships and what is achieved with them, above all collaboration, complementation, articulation. Understanding the importance of possible results is an essential condition to understand the epistemological value of interdisciplinarity and, likewise, to use it appropriately and obtain optimal results.

The theoretical elaborations that make up this work are deployed from the epistemological perspective. The word epistemology is used with notable frequency and not always correctly, because such a perspective focuses on knowledge: its production, distribution, use, assimilation and how many relationships can be established with it or regarding it. Today there are not only epistemological elaborations that are carried out with a universalist approach, through which the object of study is taken in its maximum breadth, but, with increasing frequency, emphasis is placed on knowledge from particular positions, for example, that which differentiates the knowledge from the South of that which is carried out from the North<sup>3</sup> or even more specific, such as those carried out with a gender focus,<sup>4,5</sup> which does not mean that lines do not exist of research within contemporary epistemology<sup>6</sup> that maintain the breadth inherent to the philosophical vision. This work is carried out with this epistemological breadth, therefore, Higher Education worldwide is taken into account. The reflections presented below expand on the framework of the links between what is and what should be.

This study was carried out through classic bibliographic research, which is developed with the use of existing texts, composed mainly of books and scientific articles.<sup>7</sup> Its objective is to contribute to counteracting mercantilism in higher education and the positivist theoretical positions that support it. A varied bibliography was consulted, but it responds to the topic discussed, most of it recently published, where Latin American authors stand out, although the theoretical support is in the works of the French philosopher Edgar Morin (1999; 2020) and his integrative spirit.

## Development

The university is not alien to the high levels achieved by science and technology. Today, among the most important objectives of higher education is to optimize the assimilation, transmission and use of new scientific knowledge, but the indisputable importance of this purpose cannot lead to the neglect of the mission of promoting and stimulating multilateral human development (physical and spiritual), nor can the intention of training future professionals be relegated to lower levels so that they are capable of solving the new problems of their specialty and of society, as well as of reaching higher levels in these endeavors, but without losing of view that they are human beings and must be educated as such. Nor should other objectives be downplayed: taking advantage of and increasing the good created by humanity in its path, attacking and exterminating social injustice, caring for the planet, preserving diversity in all its manifestations, as well as expanding and enriching the spiritual universe of each human being, which not only means ensuring that they have greater knowledge and a powerful affectivity given by broad and varied feelings, emotions and passions, but also strengthening the critical capacity to differentiate evil and good and being able to act consciously, as well as stimulating diversity as a property of selection capacity.

As said before, in the conception of higher education and in its own development, various trends are observed, which take consistency from the purposes that are pursued with it and by a series of characteristics that it has or that is you want to achieve. One of these trends is mercantilist, which consists of conceiving higher education “as a highly profitable consumer good (merchandise), due to the incorporation of students in the international environment, establishment of universities abroad, authorization of franchises, the virtual teaching, among others” (García Mazo, 2018, p. 39). At the theoretical basis of mercantilism in higher education, among other aspects, is the positivist philosophy.

### Mercantilism and positivism in the higher education

Among the causes of the origin of the mercantilist trend in higher education is the influence of positivism: a philosophy created by Auguste Comte (1798-1857) in the 1830s, assumed since the end of the 19th century and throughout the 20th century by societies most advanced in Europe and America, on which they developed a modernizing spirit. Among its characteristics are the preponderance of experimental science, the intention to overcome metaphysical speculation and its influence on science, the staunch defense of the spirit of objectivity and rigor in the use of the scientific method, as well as the assumption of the position philosophy highlighted by the French philosopher Renato Descarte (1596-1650), according to which it was recognized that reason is the only human faculty capable of providing accurate, that is, scientific, knowledge and, therefore, it is the quality that allows the human being doing science.

From the perspective of positivism, the empirical scientific method is the one that is recognized as truly scientific and, as a result, as Guamán et al.<sup>8</sup> state, metaphysics and any proposition that is not linked to verified facts or that can be demonstrated. On this basis, mathematics and statistical systems, diagnoses, quantitative evaluation of results and verifiability are prioritized; in this way, the aspiration to It is not that the merit or importance of the purpose of achieving the greatest possible objectivity should be downplayed, nor is it that it is denied that philosophical reflection needs precision and clarity, just as they are necessary for science. Ambiguity is not always the best option and this statement cannot be understood as an attack on ambiguity. But

precision and clarity, as Iranzo<sup>9</sup> emphasizes, are instrumental values of extreme importance to guide philosophical discourse and research; this statement cannot be interpreted as being mandatory objectives for philosophical reflection or that one must “suppose that Carrying them out implies in itself a philosophical performance, an effective gain in the understanding of the fundamental concepts of art, science, and morality” (p. 113), but rather, that both qualities: precision and clarity are philosophical values and, in to a large extent, they are essential.

What has commonly happened from the positivist perspective is the overvaluation of objectivity and with it, the overvaluation of the quantitative, of the verifiable and the demand that the knowing subject distance himself as much as possible from the object of knowledge, that is, that the knowledge is totally external to the human being. On this basis, to guarantee the correct use of the scientific method, the rigor in its use and with it, the reliability and certainty, unfounded opinions and opinions must be left out of the work of science, that is, everything that it is not possible to confirm.

Based on extreme objectivity, affectivity is categorically excluded, because it is considered that it affects objectivity and, therefore, brings disastrous consequences for the performance of science. From positivism, the uniqueness of human behavior is belittled or ignored and, as Martel<sup>10</sup> assures along with this, “the success achieved in the natural sciences and technology has sought to be imposed on the study of human behavior” (p. 82). But it must be clear that one thing is the scientific study of the human being and another thing is the human study of itself. This delimitation should be understood as openness to both variants, as each one has its value.

Another characteristic of positivism, related to the previous ones, is that scientific discourse has to be as austere as possible. This means that adjectives must be dispensed, because they indicate valuation, and this is subjective. For this reason, for a narrative to have a scientific character it must necessarily be impersonal. With this form it is sought that the subject is absent. It is also a characteristic of it that the requirement for investigations of purely human affairs and society to be considered scientific must respond to the positivist model, otherwise, they are not scientific and this means that they are not true. Here we must clarify that certainty is not only in the power of what is understood as science, since there is also certainty in other human studies. The striking issue is how to reach the certainty that there is certainty.

From the perspective of positivism, the social and humanistic sciences are required to use the methods used in the natural and exact sciences, which are, according to this criterion, the real sciences, which also tend to include technical specialties. From this perspective, studies about the human by themselves do not qualify to become accurate knowledge, and when true scientists are able to recognize that certain social and humanistic investigations can rise to the summit where science is, they have done so because, they have been adapted to the demands of what is conceived as strictly scientific.

The influence of positivism has been decreasing since the middle of the 20<sup>th</sup> century as a consequence of several facts, among them, the deployment of different views on science and scientific work, for example that according to which both are observed in close ties with the community of scientists, with society and with culture, so they are conceived with their sociocultural conditioning and not as eternal and immutable facts. But we cannot lose sight of the fact that positivism still exists, that it is still influential and that it is noticeable

in education in general and, particularly in higher education, especially through epistemological positions, determining in many scientific and academic communities. An interesting fact is offered by Clemente and Adúriz-Bravo,<sup>7</sup> according to these authors in Brazil “in the theoretical lessons, problem solving and especially in the practical work of university training in science, the positivist tradition continues strongly. present to this day” (p. 305), however, they themselves show that university education in the institutions that they took as an object of research does not study positivist philosophy, which, as can be understood from their words, would contribute to strengthen the scientific education of students, nor is there solid knowledge of epistemology, which, as can be inferred, for them is an independent specialty dedicated to the study of science. This theoretical position is observed in other authors, such as Artigue<sup>11</sup> although in the reflections of all of them the presence of philosophy can be perceived that suggests that epistemology, no matter how specific and concrete it may be, continues to be a philosophical specialty. This criterion can still be found in many authors, such as Yucra and Bernedo.<sup>12</sup>

Positivist epistemology has become evident in higher education in many aspects, among them, in the division of knowledge and, as a consequence, in the strict division of subjects, which must respond to scientific specialization, that is, to the disciplines of science to which they belong. On this basis, specialists have been in charge of differentiating them and establishing, with care and rigorous criteria, what belongs to each one. On the other hand, positivism has greatly influenced the understanding that the teacher is the only producer and disseminator of true knowledge, while the role of passive recipient and reproducer of knowledge is reserved for the student.

From a positive perspective, higher education must be opened exclusively to scientific knowledge. This characteristic may seem great, because it means that it is open to progress, but the matter is not so simple, because only the knowledge of science is valuable and true, while other types of knowledge are excluded from the teaching-learning process, for example, that of cultural traditions and that of social specificities.

Epistemological pluralism and epistemological dialogue have a significant space here. In this section, intercultural education comes to light, where dialogue is the openness to subaltern knowledge to move from the monologue of a culture and a language, to “recognition of epistemological pluralism and an equitable and horizontal exchange”,<sup>13</sup> which leads to granting a central position to epistemology and with it to becoming aware of the existence of the hegemony of the Western knowledge system. The spirit of Bateson’s<sup>14</sup> ideas (1998) is present in these reasonings, specifically regarding openness to traditional knowledge, a position that, in addition to pursuing certain epistemological justice, contributes to the cognitive enrichment of professionals in training. Not distant from this epistemological position is that of Boaventura de Sousa<sup>15</sup> and his fight against exclusions and against “the monoculture of scientific and technological knowledge, with total contempt for the epistemological diversity of the world” (p. 160)

In positivism, enormous importance is given to quantification and quantifiable results. This fact favors that higher education institutions that are developed guided by this philosophy come to be conceived as entities that have to provide figures and not because they are dedicated with extreme depth to mathematics, which would be great, but for the number of graduates, the number of courses and, among many possible examples, for the amount of money they earn. In this way,

they are seen as part of the market mechanisms and, in this way, they are transformed into a company, which, as such, has to compete with its peers and rise on the international scale of said institutions.

This logic is based on the financing provided by the State, various organizations and private companies, where institutions and specialties with the greatest capacity to obtain practical results and financial gains are privileged; In this case, natural and technical sciences have a privileged place. This phenomenon began to take on much greater force in the 1980s, when the prominence of the market and with it, that of goods and the quantifiable, was reinforced in the international arena, as a consequence of the wide dissemination of neoliberalism and its ideology equipped with instrumentalist rationalism, equipped with positivism. This position has been associated with the priority given to factual scientific research. Consequently, in higher education that follows the mercantilist trend, priority is given to the training of professionals prepared to carry out this type of research, which is valuable, but not the only one; furthermore, this does not justify neglecting theory and research theoretical. Each one has its value, and both complement each other.

There are several results of mercantilist positions in higher education, such as the disregard for the development of students' critical thinking, the inclusion in teaching of ethical and political content, history, literature and philosophy. Regarding this topic, it is appropriate to bring up some reflections from the American philosopher Marta Nussbaum (2010), who asserts that "in almost all nations of the world, subjects and careers related to the arts and humanities are being eradicated, both at the primary and secondary level as well as at the tertiary and university level" (p. 17) and assures that those who support mercantilism in higher education conceive them as superfluous ornaments, useless to be competent in the global market. The criterion that the humanities are unnecessary is held not only by theorists and apologists of neoliberalism or other theoretical currents close to it, but also by young university students, who, as the author Monge Ortiz<sup>16</sup> assures, are clearly influenced by those ideological positions, they believe that these specialties "do not contain productive courses or careers" (p. 7) and therefore consider "the humanities as a waste of time" (p. 8).

These educational models loaded with dismissal of the humanities have a theoretical basis with a marked propensity for the empirical; For this reason, they are, in fact, a manifestation of empiricism or, to put it more appropriately, of a neo-empiricism or a "pseudo-empiricism, since it does not support its knowledge in practice in its generic sense but in a certain type of practices, to namely, those that have to do with the validation and legitimacy of the dominant discourse of techno-modernity".<sup>17</sup> Confronting mercantilism is fighting against neo-empiricism and this, at the same time, means fighting against old positions, although disguised and clothed according to current fashion, as generally happens with the doctrines, movements, styles, that carry the prefix neo, which, In its specific case, it is also closed to theory and its advances.

All this makes us think about the convenience of implementing critical debates on epistemological content in higher education to overcome the positivist legacy in its fields. Through scientific controversy the university community can become aware of the importance of assuming paradigms that incorporate social dimensions in the understanding of knowledge. Just as the student's participation is currently emphasized in the formation of their own curriculum and in the learning process, and as each day it is understood more and

with greater breadth and depth, that the segmentation of content is inappropriate and that higher education of the future cannot be linked either to the fragmented knowledge, or to the discrimination of some type of knowledge, today we must think much more, with greater emphasis, on the educational convenience of teaching programs in the technical and natural sciences having humanistic subjects.

Marta Nussbaum (2010) emphasizes the contempt and rejection of everything that fits into the humanistic aspects of science, such as imagination and creativity, but much more critical thinking. From this he notes that "it is losing ground to the extent that countries choose to promote short-term profitability through the cultivation of utilitarian and practical capabilities, suitable for generating income" (p. 17) and emphasizes that with this desire for growth economically, people are not as interested as they should be in the direction of education and democracy.

In correspondence with the arguments of the American philosopher, it is necessary to take into account and emphasize that the relationship between science and values (epistemic and non-epistemic, to classify them in some way), continues in the attention of specialists of the most diverse kinds<sup>18</sup> and this is the case with the value of Philosophy of Science, both seen in a general way, and related in a particular way to the teaching-learning process, specifically of the sciences.<sup>19</sup> But there is something else to highlight: at the bottom of these reflections is the concern for citizen training, that is, for training not only professionals but professionals who are citizens, with their duties and rights as such.

### Approach to the theory of citizen formation

In the pedagogical framework, citizen training is conceived as part of the educational process. Its components are cognitive and attitudinal and, with them, values and evaluations, as well as civic skills and competencies. When it constitutes an object of attention at the higher educational level, it is to provide a graduate who is capable of thinking about the environment and making contributions to humanity. In this endeavor it is convenient to combine three perspectives: that of the process of influences that must be carried out - perspective of exteriority -, that of the motivations and intentions of the individual who is the object of citizen training - perspective of interiority - and that of what is desired to be formed - perspective of result.<sup>20</sup> This training is associated with values, particularly responsibility, solidarity and participation in the community, with the well-defined purpose of identifying with the community and respecting coexistence (Rivera and Sánchez, 2022).

Citizenship Formation is basically linked to the word citizen. The latter has several meanings, the one that is closest to the essence of the word is that it is called that, that is, citizen, someone who is a native or resident of a city; but it also refers to the subject of political rights and that through them he intervenes in the government of the country. This last meaning is very taken into account; therefore, the word is generally limited to the relationship of the person with the State. This situation may have the result that citizen formation is understood to be a process linked exclusively to serving the State and that it is not justified as a socialization process, which must be systematic and intentional, whose objective is to ensure that individuals become citizens in the broader sense and are aware of it, which means that they are leading actors in society, that is, they have the possibility of participating fully in society. Hence the need to rethink citizen education so that it accentuates and "makes visible the plurality of identities, diversity and otherness as characteristics of current democracy".<sup>21</sup>

It may be thought that the objectives of the citizen education process are clear, that they are known and that it is not necessary to return to them, among which the knowledge of society, the State and its laws stand out, as well as the promotion of socio-political activism, but It must be thought that there may be something new in this and that in fact it exists, for example, in terms of the tools with which it is hoped to make citizen education visible in higher education institutions, among which are not only the forms of teaching, that can always be new, but also the instruments of opening the university to the community and promoting democratization on its premises.<sup>22</sup>

Today it is increasingly urgent to ensure that each human individual is able to discern between the positive and the negative and make decisions for themselves. That is how it happens with respect to the professional who is training at the university. This purpose leads to citizen education not only being a system of actions aimed at providing the student with the aforementioned knowledge, combined with that of the specific profession. And here it is worth emphasizing that such a system is highly valuable, but together with it and as part of it, the development of other personality characteristics must be promoted and thus train not only professionals, but also citizens and, even more, human beings with qualities superiors, willing and prepared to transform the world in order to increase the well-being of humanity.

Here it is worth bringing up three specific areas for citizen education: the teaching content around society, the relations of participation within the school institution and the relations between the actors of said institution and the community, the latter seen both in a micro sense, as well as macro.<sup>23</sup> Citizen training must be an essential component of professional training and respond to the demands of society.<sup>24</sup> Its basic purpose is to achieve citizen behavior in accordance with the prevailing laws and the rules of coexistence in a specific socio-historical context. Citizen training in higher education constitutes a complex and comprehensive process, whose contents and characteristics are an expression of the historical conditions of the time and are basically related to the social responsibility of the university, given, above all, by the defense of human rights, democracy and social justice.

It is worth noting that the reflections presented above cannot be interpreted as a denial of the attention that must be given in higher education to the aspects of the world of work, of productive efficiency, it cannot be alien to such matters, but it cannot be limited to them. Conceiving knowledge in an instrumental way is reductionism and, in turn, the denial of human complexity, or at least, its neglect.

Although many positivist ideas are still influential in higher education, especially epistemological, there are simultaneously other ideals and approaches; Some of them have become stronger and become perceptible and influential in a certain way, such as complex thinking, with great epistemological consistency, which leads to thinking and seeing differently not only matters related to knowledge and science, but also others, new and old, who must be understood, explained and treated in a different way.

### **Complex thinking and the higher education: notes on their relationships**

The notion of Complex Thinking was introduced by the French philosopher Edgar Morin at the end of the 1960s, but its diffusion intensified at the turn of the 20<sup>th</sup> and 21<sup>st</sup> centuries. The word complexity refers to the quality of complex. This word has more

than one meaning, among them: it is made up of diverse elements; complicated, tangled, difficult. With the first of these meanings, Morin takes the term complexity to refer to the diversity of everything that exists, not only because of the variety of components, but also and above all, because they exist in multiple relationships.

Morin<sup>25</sup> himself points out in a few words that “there is complexity when the different elements that constitute a whole are inseparable” (p. 15). But, apparently, he is not satisfied with this verbal exposition and adds, as a clarification, that “complexity is the union between unity and multiplicity” (p. 16). He underlines this statement with an epistemological vision and goes so far as to express, without losing brevity and concision, that “there is an interdependent, interactive and inter-retroactive fabric between the object of knowledge and its context, the parts and the whole, the whole and the parts, the parts between them” (p. 16).

Complex thinking highlights the fabric of events, actions, interactions, feedbacks, determinations, chance, that constitute the phenomenal world where the human being lives, “entering into the complex perspective entails a change of mentality and paradigm, based on the relationship constant between apparently contradictory elements such as: order-disorder, balance-imbalance, certainty-uncertainty, logic-illogical, objectivity-subjectivity, the whole-the parts, the established-the ambiguous”.<sup>26</sup> Thus, complexity is presented with the disturbing features of the entangled, the inextricable, the disorder, the ambiguity, the uncertainty, but also the united, the totality and, consequently, opposed to the fractionation imposed by the human being in dependence on their interests and even their whims. Morin<sup>27</sup> points out that “human reality, as it is usually conceived, is cut into pieces or fractions, dispersed for study in a lot of separate disciplines, isolated from each other” (p. 33) and affirms that these must be broken unfounded parcels built over the centuries and that it is necessary to move towards integration, especially of knowledge, which presumes to incorporate approaches of complementarity, interception and approximation of knowledge. From all this, the convenience of the multidimensional perspective emerges.

Complex thinking is born as reflections that encourage openness between knowledge and communication between them. This condition, when taken to the concrete framework of scientific research, is translated as the requirement that all members of the research teams, instead of feudally enclosing themselves in their subjects, open themselves to the others, the concomitant ones and the distant ones that propose to share a conceptual background that guarantees a dialogue and a joint search. Here is the essence of interdisciplinary work.

When observing higher education through these ideas and statements of the French philosopher, the need to carry out transformations stands out, which imply questioning and breaking traditional structures, not only of the administrative organization, which is not the topic to be discussed on this occasion, but also , and more emphatically, of all its other issues, such as the teaching-learning process, where the curriculum and its actors have a singular importance, which are the people who make it a reality, regardless of the position they occupy in it.

Complex Thinking offers experimentation strategies in a learning-by-doing environment to create, explore, test, evaluate. All of this, when brought to the field of higher education, joins the purpose of building an essentially new teaching-learning process, due to its breadth and openness, but also that it has a greater place for human

spiritual enrichment and with its use for the benefit of society. It is a difficult task and it is not individual, but collective, among other reasons, because it requires exchange between those who work in disjoint domains and, above all, poured into it.

The changes that Morin<sup>25</sup> points out are based not only on knowledge and objective reality; In them, the way in which they conceive the human being has a fundamental importance, that is, the conception about them that they develop, which is based on the fact that they conceive the human essence not in isolated components, as throughout history it has been seen carried out in a general way, but in its complexity, constituted by several components and not only in the harmony achievable between them, but in their contradictions, in their oppositions.

Morin<sup>27</sup> points out that it is necessary to internalize that the human is not only an individual or social being, or only a biological or animal being, but that it must be understood in the permanent relationship of retrointerrelation between the biological human that produces the cultural human, which continues to produce the biological human. He illustrates this same idea with other words, in a different way, when he states the following: “Homo is not only Homo sapiens, it is also homo demens” (p. 34) and to make the complexity with which he conceives being clearer human, he then states: “Madness is not an extremism of the insane that is found in asylums. Madness is always present in each of us like anger and fury, ambition, violence” (p. 34).

Along with this, it is necessary to understand another idea that Morin<sup>27</sup> exposes, supported by studies on the brain and the demonstration carried out by them that when the rational is activated in the human brain, the emotional is also activated and, therefore, , that reason does not exist alone, in a pure way; In this way, he maintains that “there is no reason without passion, without emotion” (p. 34) and, also, as if to emphasize the previous idea, he warns the following: “We should not remain in cold reason nor should we fall into madness and passion without control of reason. We must always establish, each time anew, a dialectic of reason and passion” (p. 34).

Two important ideas emerge from these reflections of the French philosopher, known, but not attended to with adequate dedication and care; on the one hand, that affectivity, that is, emotions, feelings and passions, require greater attention, and on the other, that we cannot lose sight of the dialectic between reason and affectivity. Regarding the latter, a clarification is worth it, although for some people it may be unnecessary or extremely repetitive, and that is that, by giving importance to affectivity, reason should not be underestimated. It is not falling to the other extreme.

Since the end of the last century, as can be seen not only in specialized publications, but also in scientific meetings, interest has been increasing in the links between reason and affectivity, as well as in their importance in daily life. Another clarification is appropriate here: the previous statement does not mean, not even remotely, that before said period no one had been interested in such a topic.

In the educational sector and specifically in the higher level, valuable reflections take place about the conjugation of the rational and the affective, although those focused on affectivity stand out, more than anything on emotions and on a type of feeling: love. Regarding the latter, one can find, with some frequency, statements like the following: “Teaching as an act of love must be seen as a process of transformation and change that allows us to know our reality, and

then take action”<sup>28</sup> where its role in academic work, specifically in teaching, is highlighted.

In higher education, teaching must always be an act of love, and surely this is often the case; That is why another clarification is appropriate and that is that the request to attend more carefully to affectivity does not mean that it has been absent; It is impossible for it to have happened, above all because the human being is essentially emotional, affectivity is part of his essence, every person has it to one degree or another and, therefore, it is impossible for any human work to be done with his total absence. What it is about, worth insisting, is to give it greater importance, to attend to it with rationality and affection, that is, to value emotions, feelings and passions in the work of higher education, in teaching and also in learning.

Learning should be an act of love. We must prioritize and emphasize the effort to make students show love when learning, making this an act of affection and, above all, affection, tenderness, pleasure, and joy. In the laborious and very urgent work of increasing affectivity in higher education, affective teaching is not the most difficult thing to achieve, because teachers, in general, carry out teaching with affability and other similar qualities, however, this does not mean that it is not necessary to give it greater attention.

To these efforts, difficult as well as valuable, is added today the use of information and communication technologies, which is a challenge not only for teachers, but also for the student body; Today, students are having, in crescendo, greater and better possibilities to study independently, so it would be very beneficial, in the sense of the topic being discussed, for every teacher to take affectivity into account in the orientations that it reaches each student, not only so that they receive affection, but so that they carry out their tasks with love, that is, that they enjoy studying and during that time they expand their loving capacity, which will surely lead, later, to relationships with their like-minded people. There is no reason to allow the human being of the future to be essentially cold.

In all scientific work and in its own fruit: science, passions and feelings are present, as well as emotions, including the very big and the very strong ones; What happens is that when science is conceived on a positivist basis, for the sake of objectivity and the achievement of calm results, affectivity has to stay on the sidelines, behind, to give all the space to reason, so prone to the cold calculation and the serenity and imperturbability that favor it. In positivist higher education, a similar thing happens in terms of the relationship between reason and affectivity and, in the same way, there is also a need to remedy the aforementioned disproportion. Interdisciplinarity can contribute to achieving this goal and in this, the humanities can play a very important role.

### **Interdisciplinary. regarding its realization in higher education**

The term discipline is typical of Modernity. Previously there were no close relationships between various forms of knowledge, nor was there a strict differentiation of the sciences; nor insurmountable barriers within knowledge. The differentiation of science began to manifest itself, at least markedly, in the Renaissance and was the result of the specialization and strengthening of the boundaries between each branch of knowledge, which took place with the development of knowledge. Within the framework of specialization, each scholar took refuge in the branch of knowledge to which he dedicated himself

and, even more, it enclosed him in the borders that he was building, without relationships with other knowledge, or, in the best of cases, with much delimited links and generally very entrenched in the specificities of each science. However, not all scientists acted like this, nor was this type of behavior unique since then. In general, scientists and more enlightened thinkers have an open mind that allows them to go beyond the boundaries of their specialties and transgress what is stipulated, what is conceived as natural and obligatory, and show that there is something valuable, true and correct, beyond the fence that seems insurmountable.

Specialization has had a significant impact in the academic field, especially in terms of the conception of what should be taught and how it should be done. In this context, disciplines have generally been seen as bodies of knowledge formed historically and in constant transformation, which are derived from the different sciences, with which they maintain basic links. But since not all scholars and specialists are limited to a specialty, the borders between them have been opening as the specific historical-social conditions and the intrepidity of those people, who, perhaps, were often qualified as of disordered, transgressive and heretical. In this process of breaking contours, opening, transferring and closing and censorship, the notion of openness and exchange between disciplines or specialties was formed.

Regarding interdisciplinarity, it is worth highlighting the task aimed at integrating knowledge, specifically logic, metaphysics and aesthetics. The author Gutiérrez<sup>29</sup> states that some scholars find the roots of the word in the ideas of the German philosopher and historian Friedrich Herbart (1776-1841), although they attribute it to the sociologist Louis Wirtz, who place the emergence in 1937, but point out the increase of its use from the 1970s and the beginning as an epistemological proposal at the end of the 19th century.

The category interdisciplinarity basically refers to a process of opening and diversification of relationships between sciences, which can be of two types: between more than one science or specialty or discipline, and within them, that is, between specialties or the disciplines that are part of a science. The primary thing is the openness between them.

On this basis, the opinion of the author Guzón<sup>2</sup> can be shared, in that the novelty of interdisciplinarity with respect to multidisciplinary is that it provides “a greater relationship and interweaving of the various sciences” (p. 104). To understand interdisciplinarity and make use of it, the categories relationship and imbrication are essential, which in order to be valuable in this case must be together; just one is not enough. It is necessary that, simultaneously, there be solidity in the links and even more, that there be articulation and, above all, that complementarity be achieved, which may be what the aforementioned author meant, metaphorically, when he wrote imbrication, a word which, according to dictionaries, means partial superposition of similar things.

Interdisciplinarity is not a capricious articulation of disciplines. The author Bazdresch<sup>30</sup> points out a series of ideas of great importance for this topic. First, it is “to relativize the disciplines and go to an integral starting point” (p. 46), that is, it is to reintegrate what had been separated in the light of Western thought, with the very good intentions of deepening the cognitive activity; second, that the fragmentation and distancing between the sciences allowed, and continues to make possible to a considerable extent, the obtaining of great and impressive advances in science, but at the same time it has

prevented and often continues to prevent the seeing of “the secondary effects’ of the application of partial truths in a complex and articulated reality” (p. 47); third, that with these truths, which are results of the separate disciplines, each one is satisfied “without reviewing how the advances of others qualify, complete or even deny such unidisciplinary statements” (p. 47).

Interdisciplinarity corresponds to the essence of complex thinking, according to which it is necessary to establish dialogues, that is, links, between the different specialties involved in a specific matter. In order to understand problems that are characterized by their complexity, it is necessary to study them simultaneously from several perspectives and this includes, as a preliminary step that those who are involved in a certain scientific research must try to understand the language of other teammates.

Interdisciplinary dialogue is not just another strategy. It is the initial step of interdisciplinarity. This has its starting point in the sincere assessment of one person with respect to the other, as well as in their ability to approach aspects of a problem, which would be inaccessible outside of the contrast of points of view. The word dialogue does not simply mean sharing a criterion, or thinking in a similar way. In the exchange of ideas and opinions that is conversation, there must not only be understanding; In fact, there can also be contradiction, opposition, although the objective pursued in this meeting is to understand each other and on this basis find some solution or reach an agreement. In its development, knowledge is partial and hypothetical and the opinion of other researchers is always appropriate to gain clarity and depth. On this basis, a series of links come to light, such as those between natural and human phenomena, as well as between social and individual phenomena. From this perspective it is possible not only to see them online, but also with their natural dynamism.

The opening of relationships between the sciences, as well as the articulation and complementarity that is aspired to be achieved between them and that is included in the category interdisciplinarity, very quickly extended to higher education, because every scientific specialty is inextricably linked to its teaching and learning.

Among the definitions of interdisciplinarity from the perspective of teaching is that of the author Gutiérrez<sup>29</sup> who understands it as “a process of exchange and collaboration between two or more disciplines or subjects” (p. 96). On this basis, it describes the characteristics that are achieved through said systematically planned process: increasing degree of complexity; new vision of the object of study due to the epistemological, methodological, axiological, ontological, psychological and pedagogical openness; flexibility of the boundaries of knowledge, which enriches the people involved in this relationship and the disciplines and shortens the distance between theory and practice.

In the academic field, when referring to openness to other dialogues and discourses, the author Cepeda<sup>31</sup> addresses an issue of extreme importance and, at the same time, difficult to address, because it can be misinterpreted: the usefulness of interdisciplinary work. He points out that the benefit is given not only to “identify the difficulties that shake the school system, but also to counteract the barriers that students and teachers face in their quality of difference” (p. 129). The significance of these words is not so much that they indicate the identification of difficulties, nor the urgency of breaking down barriers, but rather that they include teachers and students. If we can speak of victims of closed disciplinarity, such a condition is present not only in the content, nor in the much-discussed objective

reality, but also in those who teach and those who learn, especially the latter, because they receive caricatured knowledge, since in this way, so separate and distant, it does not exist, because that is not life.

Interdisciplinarity in higher education continues to be a challenge, especially for educational sciences. To develop it, for example, in Cuba a series of routes have been thought of, among which the following are: Transverse axes; director programs; project method; guidelines.<sup>29</sup> All these propositions have their value and have had their fruits; Now, there is something essential, which cannot be forgotten or relegated to lower levels, when it comes to this matter: “For there to be interdisciplinarity, integration of the contributions of various disciplines is required when facing a problem”,<sup>32</sup> here is the core of any interdisciplinary idea or proposal.

Higher education has the challenge of adapting study plans to the characteristics of scientific research of these times, among them are those mentioned by the author Vázquez,<sup>33</sup> one of which is that the requests for them to be carried out “come from mostly from companies, public organizations and private funds or foundations” (p. 219), which themselves are “the main source of financing for research programs” (p. 219) and which “require the development of research projects with an increasingly greater component of interdisciplinarity, given the complexity of the problems that concern us” (p. 219). That is to say, interdisciplinarity in higher education has two causes at the same time. One of them is the interdisciplinary need of society, based on the objective demand that knowledge be opened to each other and that certain objects be studied, whose particularities can only be studied in the interdisciplinary framework, given above all by the increase in complexity of them. The other visible cause is that the institutions that financially support scientific research demand that it be carried out in an interdisciplinary manner based on awareness of the aforementioned characteristics of society and knowledge.

Regarding the increase in its use, as well as the acceptance and recognition by society and above all, by the university academic community, the criteria of the authors Suárez Monzón et al.<sup>34</sup> is striking in that in a society which is characterized by globalization, universalization and internationalization, “no one doubts that interdisciplinarity is a sine qua non in university teaching practice” (p. 55). If this categorical statement were true, which, without pretensions of resorting to positivism, would have to be demonstrated, it would be truly significant that this level of widespread acceptance had been reached and that it had been put into practice in such a systematic way that it would not be conceived higher education without it.

The formation of interdisciplinary teams is one of the characteristics of scientific work in these times. These teams can be formed between the disciplines of a science or between different science disciplines and, according to Carvajal<sup>35</sup> “they can contribute very little, if they contribute only with a technical vision, without integrating their knowledge with the other disciplines” (p. 156) and not only related ones, but also others, for example, the humanities, which can be useful to all sciences in their performance, also in higher education.

The current globalized historical context fosters the emergence of knowledge and the need to reinterpret references and traditions. There is no doubt that it would be a historical contradiction to remain in the models and traditions of scientific knowledge that are typical of Modernity. Today it is important to think about knowledge in a way that articulates elements that were once discarded because they were considered less rational. These positions increase their value within the

framework of higher education and open the way to interdisciplinarity and other knowledge, among which are the humanities.

### Humanities and interdisciplinarity: a topic to think about a lot more

The humanities category is extremely controversial. There are dissimilar criteria regarding it and quite a few are at odds with each other. In the reflections that follow, reference will be made only to some specialties that are generally included in it. It is done this way to gain precision, not as epistemological reductionism. There was never any attempt to give details, nor to offer methodological recommendations based on specificities.

The treatment of this content has a practical side that leads to the revelation of its usefulness and, consequently, to the answer to the following question: What benefit can the humanities in interdisciplinarity contribute to other non-humanistic specialties? The interest in such a revelation cannot be interpreted as a crude utilitarianism and it is not, because there is no intention to make benefit an absolute, but in order to avoid it, one cannot stop thinking about how useful something can be. Nor is the value of the teaching-learning process of any science questioned, nor its ability to develop it with a quality of excellence, nor is the well-known importance of university courses that solve practical problems of society, among which are engineering, computing, law, social communication or business administration, just to mention a few.

The essential issue addressed in this text is to highlight an idea that is surely known in many ways by specialists in all sciences, but that they do not value it, at least, as it should be, and that is that all of them obtain benefits of the humanities when they participate, jointly, in interdisciplinarity. The humanities provide knowledge and perspectives that contribute to the human improvement of those involved in interdisciplinarity.

The doctor, computer scientist or engineer may think that their specialty is sufficient to achieve that purpose, and they are not completely wrong, because each of them provides knowledge that, unquestionably, raises the cultural level and influences human behavior in society. In teaching any of these specialties and in others, similar or very different, you can talk about art, literature, languages, history or topics that are related to this knowledge, it is even possible to obtain results specific to the humanities. For example, the Chemistry teacher can talk about the beauty that is observed when one substance reacts with another, the biologist can guide tasks in English, and the engineer can show the presence in a novel of one of the engineering wonders of a country. The realization of such connections depends, first, on the professors of each of these disciplines, who want and propose to do so, and then, on the students, who are interested in topics like these and that it is done systematically. But what has just been explained is not exactly interdisciplinarity; to conceive it that way is to reduce it and misunderstand it.

The essence of interdisciplinarity is in articulation and complementation, it is not simply the opening of spaces that are made in one discipline to contents of another discipline. Certainly, as has been reiterated, it requires openness and dialogue, but in the first instance. The statement stated above that the humanities provide knowledge and perspectives that contribute to the improvement as human beings of those involved in the aforementioned interdisciplinarity, deserves a little more explanation. It is necessary to present some arguments as



to why, for example, from the technical and natural sciences we must think about interdisciplinarity with the humanities.

Among the many reasons that can be given is the purpose of enriching the spiritual universe of the students, to which works of art and literature can contribute in a special way. This purpose is achieved not only when such works are liked or when they provide pleasure and enjoyment, but also when we come to understand what they consist of, what messages they transmit and how to understand them. The eagle has a greater visual Here a note is warranted: when this text talks about the spiritual universe, it is not making direct reference to the religious; Rather, this category refers to the spiritual life of society, that is, to the production, dissemination, consumption, and change of ideas and theories, their conservation and destruction, points of view, as well as the affectivity and the conjugation of both human capacities. In this way, with the category human spiritual universe the role and place of individual and social opinions, values, beliefs, ideals and purposes are recognized, as well as their incarnation in science, religion, philosophy, politics, literature, morality, ecology, aesthetics. Hence its close relationship with social and individual needs, interests and goals, as well as with their realization.

The richer the spiritual universe of each individual is, that is, the greater the load of knowledge, values and poetry, the greater the possibility of indolence attacking the ideas and facts that engender hatred and discrimination, which lead to the degeneration of human beings to limit, prevent or disdain their improvement, which slows down and distorts their potential. Spiritual wealth is a force to confront commercialism and indifference and contempt for spiritual wealth. It is, likewise, a power to oppose the propensity for the insubstantial, for prosaic expressions, for the decrease in courtesy, among other facts that show human degeneration and that at the same time lead to it.

Works of art and literature contribute to the improvement of human beings, not because they endow them with angelic qualities and thus purify them morally, but because they give them an unparalleled spiritual wealth that can be observed in the growth of sensitivity in its various manifestations and this It is achieved because with the knowledge they transmit they set in motion not only the rational capacities, but also the affective ones: feelings, emotions and passions. Why should you give importance to affectivity? First of all, because it, unlike reason, is not exclusive. Thus, one of the great values of this type of human achievement, with which it can play a role of unimaginable importance in interdisciplinarity, is its capacity to awaken reasoning permeated with affectivity and stimulate the latter by infusing it with rationality.

Works of art and literature stimulate ratio-affectiveness. Remarkable is, in this way, its ennobling role, among other reasons, for the profound experiences it produces in those who come into contact with it, because it can comfort from the blows that life deals and by doing so, encourages them to continue living and to do so the best way possible. Furthermore, because it limits apparently non-rational impulses and encourages a procedure more appropriate to the demands of the moment. Life shows that in adversity human beings are capable of delighting in these works and forgetting sorrows, even momentarily, of overcoming obstacles and growing as human beings, even when they do not intend to. Artistic and literary creations are, at the same time, a force that stimulates human beings to reveal their potential and improve them, especially in a critical and creative way. They are a great force to enrich the spiritual universe through the increase of actions that stimulate affectivity and simultaneously lead to thinking and acting.

The ratio-affectiveness charge that works of art and literature possess gives them harmony: neither rationalist coldness, nor vaporous affectivity. This ability provides them with the power to incite in human beings a critical perception of a greater size, suitable for reaching lofty flights; They themselves are a critical sieve through which many scientific contents can pass and thus open up in the student body the emotional understanding and reasoned affectivity that can result in better prepared men and women of science, with a broader, more balanced qualification, with a greater degree of comprehensiveness, with which human capabilities are taken advantage of to a greater extent.

On the other hand, but in connection with the above, it is worth referring to language. It is worth taking into account the following words of the author Jiménez Castaño<sup>36</sup> that science “is based on sensation and experience, but thanks to language and reason it is capable of obtaining objectivity, universality and reliability” (p.65). Along with all the other components of scientific work, language has an irreplaceable role, because with it the understanding and transmission of information is possible, in both cases thanks to oral and written expression. The latter is essential in the work of science, due to the value of scientific texts, which, in turn, must be written in accordance with the current rules regulating the use of language.

The mother language, its care and the observance of the stipulations of its use is not a unique issue for those who dedicate themselves to this specialty and other related ones, furthermore, using it correctly does not mean, not even remotely, that the “ornaments” are used typical of poems or stories. Each scientist, each researcher and each scholar is also responsible for the conservation of their language and not only because it is part of the culture and the nation, with respect to which it denotes, like none of its other components, the sense of belonging to them; Not only because the way it is used shows the level of culture and education one possesses, but because every man and woman who dedicates themselves to science intends for their message to be understood by the recipient, to capture their ideas as they are intended proposed, and the guarantee that this purpose is carried out in its proper dimension depends, a lot, on the wording. For the text to fulfill its communicative function, whoever writes it must jealously comply with the current norms of the Spanish language, not only the spelling and punctuation marks, which have a basic communicational importance. These “details”, among other no less important matters, are part of the reference specialties.

History is another of the humanities that can play a role of extraordinary significance in the deployment of the interdisciplinarity of the sciences. Your role can be broad and rich in diversity of nuances. Among the aspects that can be mentioned is making it impossible for a people to forget its history and also preventing the repetition of unwanted events, which threaten in one way or another against the country and, also, against humanity.

With the History, the articulation and conjugation between the new and the old comes to light. With them, the traditions and knowledge of yesteryear come to the fore in a dialectical game with those of the present, which provokes a process of opening towards what has already happened, as well as what is happening and what has to happen, included in this case what is intended to be avoided.

The history of a people is not only its political journey, with its battles and confrontations or with its conquests, achievements and challenges. In addition to all this, which is a lot, the history of a people includes all its actions, including cognitive ones, and these, with the

axis of relationships of the past with the present and the future, when included in the interdisciplinarity with the sciences prevent that the entire journey of a town is forgotten or relegated to levels lower than its importance deserves. This continuity is of extraordinary value for scientific work itself and for the development of higher education, particularly the interdisciplinarity that can and should take place in its field.

The fruits of science, at the same time, generate social problems of various kinds, and it is necessary not only to understand them, but also to learn to understand other human beings, to tolerate them and to respect them. One of the purposes of the humanities is, as the author Monge Ortiz<sup>16</sup> asserts, “to integrate the person into society, not only as a technician of knowledge but himself as part of that group” (p. 3) and to This requires both the reasoning and knowledge that one or another science can provide, as well as the richness of the spiritual universe, to which these specialties contribute in many ways.

The humanities have a notable role in the development of critical thinking. Today, increasing importance is given to the training of researchers, but the aim is not always to train them to think in this way. It cannot be forgotten that cognitive activity can be influenced, as the authors Zanotto & Gaeta González<sup>37</sup> say, by “false beliefs about the way to approach knowledge” (p. 168), therefore, as they themselves emphasize, Today we need to recognize “the need to strengthen criticism, reflection and reasoning” (p. 169), but, it is worth emphasizing once again, for these qualities to become optimal, they must be enriched with affectivity: feelings, emotions and passions; Above all, the latter give a special touch to cognitive activity and the deployment of criticism, which, by the way, must go beyond the limits of the approach to knowledge and must make itself felt in all the work of the scientist.

Philosophy also greatly favors the development of the human critical capacity, which is essentially rational, although it, rather than belonging to the humanities, is a specific, independent knowledge, with its own quality. However, it is sometimes included in the humanities. Leaving aside this delimitation, without meaning that it is not given importance, and with the acceptance of this inclusion, although with certain reservations, we can Philosophy is generally associated with rational capacity and the weight that affectivity has in it is ignored or underestimated. With the conjugation of both qualities, although sometimes the rational one stands out, it fulfills its functions, logical-methodological, axiological, practical-educational, emancipatory, ethical, ideological, aesthetic and humanistic. A characteristic common to all of them is their critical nature.

That last quality, which is not exclusive to philosophy, is of great importance in interdisciplinarity; Its contribution to it can be very broad and varied; it can, for example, lead to the evaluation of the epistemological bases of the science with which it maintains interdisciplinary links or to the assessment of contemporary society and from there focus on the social position that it has must be taken with respect to certain characteristics, which may be mercantilism.

The critical essence of philosophy can contribute to awakening the human being, as Araos San Martín<sup>38</sup> points out, “so that he takes the initiative again and recognizes himself as what he is: not only an inhabitant, but an opener of the world; Freedom of thought becomes freedom of action” (p.241). Philosophy enables the deployment of solid criticisms, that is, very well-founded and constructed with great coherence, therefore, whoever reflects from it generally starts from the foundations and the entrails of the facts and here lies its

power to drive the human being to get out of the lethargy that some powerful forces try to create everywhere. Power is not only political. To impose themselves and impose their criteria, the powerful can use, for example, science and technology, with the spells that cause their results, but they can also do so with the absolutization of material things and their usefulness. From a philosophical perspective you can take into account the world with all its characteristics, with the known and the unknown, and see it in its entirety.

To the above we can add the value of apprehension of the object of study not only in an instrumental way, that is, with the purpose of use, but also with the purpose of feeling them fruitively. That is, inviting, with arguments, the human being to constitute himself from love, but not exactly love towards material objects, which “leads to making us slaves of things instead of being their owners”,<sup>17</sup> but from the depths of the spiritual. This position does not mean contempt for material things.

The human being is a whirlwind of possibilities and achievements. His potential allows him to be the possessor of such qualities, which can be used in the light of the humanities with great intensity. The potential of the humanities, integrated with that of the sciences, must have effects of incalculable value. It deserves fair appreciation. These are times of integration. Comprehensiveness in education must have, among many fruits, that scientists do not become thinking machines, prominent for their insensitivity to everything that is not within the framework of their interests, which may be, increasingly, more distant from those belonging to other human beings and society. All of this can happen anywhere in the world, and sooner than imagined.

The implementation of interdisciplinarity in higher education, with greater strength and vigor, is a current demand of science and, in general, of society and culture. Complex thinking provides ideas that can be valuable in achieving this purpose, such as the openness between human knowledge and capabilities. Furthermore, today, when mercantilist positions are strong, it is necessary to deploy a greater number of philosophical and epistemological meditations on the role of spirituality in higher education and, correspondingly, the humanities and their role in the development of interdisciplinarity.<sup>39-41</sup>

## Conclusion

The mercantilist tendency in higher education is strong, not only because the society of these times takes into account the market and the profits, especially financial, which can be achieved in it, but also because its apologists maintain a work, not rarely tacit, which has permeated the various sectors of higher education. Positivism, its theoretical and practical positions in higher education, have been strengthened in the articulation it has developed with mercantilism. This mechanism is evident, above all, in many epistemological manifestations of this educational level, which, in turn, respond to a series of interests of various social sectors of science and also of economic and financial powers. The human vacuum caused by the commercialization of higher education leads to giving special importance to civic training within vocational training.

Basics of interdisciplinarity is in the treatment of a problem that only becomes solvable through the integration of several disciplines. Basic and essential for its existence are the following factors: formulation of a conceptual background that is shared by all those involved, which guarantees dialogue and joint search; establishment of communication relationships between the disciplines and achieving the integration of the disciplines. But they are not interdisciplinarity

itself, nor the core of it. Interdisciplinarity is not an end, but a means, the result of which surpasses it. The important thing is not to implement scientific research, but the result that can only be achieved with it.

In Higher Education, the interdisciplinarity that takes place within the framework of non-humanistic disciplines increases its human quality when it includes the humanities. This is due, among other reasons, to the fact that the latter provide the human perspective, which, when carefully attended to, far from affecting the objectivity of scientific results, enriches them by placing them in direct function of human beings. Furthermore, from here adequate attention can be given to a series of issues in the development of scientific research, such as the importance of affectivity, the conjugation of rational and affective capacities, language and critical thinking, in addition of putting all these factors in function of the development of the human being.

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## Conflicts of interest

The author declares there is no conflict of interest.

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