



Serie *Investigación*

IMPORTANCE OF ICT IN THE TEACHING-LEARNING PROCESS: MIDDLE AND HIGHER EDUCATION STUDIES

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IMPORTANCE OF ICT IN THE
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The integration of ICT in education entails several challenges: the first, to diagnose, at a global level, how this process is being carried out in different educational fields. Likewise, another challenge is to analyze what has really been the impact that this integration has had on improving educational quality in Colombia. It is assumed that ICT applied to education generates successful paths to promote both teaching and learning. However, it is necessary to enter the fields of education to corroborate if the previous statement is valid. A third challenge would be to analyze the effect of ICT on the efficiency of educational institutions. In this sense, it is not only necessary to determine the ICT integration process, but also to determine how the same institutions assume responsibility for the digital transformation of education. Another challenge is to validate, experiences carried out using ICT to improve learning processes. Finally, another of the challenges that can be highlighted, and is the most relevant, is the need to assume an ethical stance regarding the management of ICT in education. This book covers each of the challenges with the aim of promoting the processes of innovation and digital transformation of education from a scientific, critical, and above all, ethical perspective.



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Ethics in educational technology: a perspective in the light of philosophical texts on technique

Esequiel L. Rojas Torres¹

Abstract

This chapter refers to hermeneutical research. Its purpose is to reflect on the need for an ethics of technology in its educational use, based on the texts of three contemporary 20th-century philosophers who were interested in the subject of technique: Ortega & Gasset, Heidegger, and Mayz Vallenilla. This review leads to propose seven postulates that are proposed to ethically guide the growing use of technology in the various educational spaces. The postulates are

1. We are humans, not gods;
2. Being prevails above possessing and being useful;
3. Promoting a culture of austerity, not of consumption or discard;
4. The technique is at the service of living;
5. There are fruitful relationships between art, poetry, and technique;
6. Increasingly humane and comprehensive education is urgent;
7. The technique must lead the way to transcendence.

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Introduction

We live in a globalized, interconnected, changing society that has significantly transformed the planet and which is, at the same time, mediated by technology, that is, by modern technique. The technique is an original task present since humankind took the first steps towards rationality, or can be estimated. It has created a growing gap between people and the rest of the world's creatures, making humans a peculiar species. Ortega & Gasset (2000) said that "without technique, man would not exist and never would have existed" (p. 13) (own translation), a sufficiently incisive and lapidary phrase, to the point that makes human existence depends on it.

It is an indisputable fact that, currently, technology permeates virtually all spheres of human life. It is also evident that it offers multiple advantages in education to enhance teaching and learning: numerous studies worldwide confirm this. It is not surprising that teachers, parents, governments, educational institutions, schools, universities, and students are increasingly betting on technology inside and outside the classroom.

Over the years, educators have been entrusting technology with a good part of our daily teaching work: didactics and teaching, planning, administrative management, certification of learning, research, categorization of teachers and researchers, interaction with the student, etc. Even student performance assessment has been placed in the hands of technology, which poses the question: Shouldn't a fundamental human education element remain marked by teacher subjectivity? It is a debate worth considering.

The assistance of technology to teachers has constantly been growing and promises to keep doing so: first, as a useful and complementary learning resource; secondly, as a fundamental intermediate for learning and teacher-student relations; and thirdly, its exclusive use for learning, which sometimes makes the human teacher dispensable. Regardless, teachers are still needed for those three functions to design, plan, and evaluate. Could

an era come when technology is autonomous and completely replaces the role of the teacher? The question is not far-fetched.

As technology advances, the universe of options to strengthen teaching and learning also increases. This, in turn, highlights the intrinsic limit on the horizon of possibilities. Over time, with technology, anything will be possible in education: there will be no limits to what could be done. In a way, we have entered a new world of infinite possibilities, such as learning through virtual or augmented reality (Extended Reality), to name two recent trends in educational technology.

It is human to think and rethink seriously and responsibly about our actions. It is prudent to set limits to power and unlimited power that technology has been offering us. That is precisely the issue that concerns us in this chapter. What remains in the substrate of what has been said so far is what some philosophers posed as the interrogations of technique. What is the technique? Why does it permeate all our daily lives decisively? We could even ask: How should our relationship with it be? How should we deal with it? All these questions will be specially regarded in the field of education.

There is an ethical stance regarding our relationship with technology or how we should deal with it. “Must be” questions remit to the moral realm, or even still, the world of ethics. According to Camps (2002), “it seems accurate to describe «ethics» as ideas that, regardless of whether they refer to the polis, to society or to the individual, are ultimately a question of duty” (p. 11) (own translation). No matter how much humankind flees from ethical thinking or avoids ethical questions, responsibility for their actions remains inescapable.

For this research, some great philosophers of the 20th century reflected on technique and the technological world were reviewed. Such authors are the Spanish José Ortega & Gasset, the German Martin Heidegger, and the Venezuelan Ernesto Mayz Vallenilla. Although they did not live in the last decade of the 20th century, or in the 21st century, a period of relevant social technification, they managed to foresee what was coming and offered reflections that can be very useful for thinking about ethics educational technology.

The purpose of this chapter is to reflect on the need for an ethics of technology in its educational use, based on the texts of some contemporary philosophers who were interested in the subject of technique during the 20th century. First, the elements that make up the dawn and the context of this research are addressed. The methodological approach that guided the research will then be described. Next, the texts from the mentioned authors and their interpretation are reviewed. The postulates derived from the categories extracted from the analyzed texts and the final discussion are gathered in the final chapter.

The challenge of the technique

Technique is one of those human activities about which everyone seems to have things to say. In fact, it is linked to all sciences, culture, arts, knowledge in general, education, research, military activity, politics, economics, etc. The relationship that humans have with technique dates even from our very genesis and has earned us the denomination, of *Homo Faber* (Bergson, 1959). In the preceding paragraphs we have addressed its close relationship with the world of current education.

And what is technique? Here, it is understood as a genuinely human task through which processes and artifacts are artificially produced, which allow transforming the environment so that it adapts to our needs and interests. Therefore, technique leads people to inhabit the world, as it conditions the environment to our needs. The last historical phase of this human task is modern technology. Technology refers to that same original technique that produces artifacts and processes, but now favored by modern science. Thus, the terms modern technology and technique are here used as synonyms.

Etymologically, technique derives from the Greek τέχνη [techne], which means technique, art, trade, skill. As for the term technology, it is made up of the previous etymology of τέχνη [techne] adding another Greek root, λόγος [logos], which means science, treaty or discipline. Bailly (1993) indicates that the term τεχνολογία ας (η) [technology] already appears in texts of Cicero, Plutarch and Sexto Empírico, and by then it referred to a “treaty or dissertation on the rules of an art, or exposition of the rules of art” (p. 1924) (own translation). This is interesting because the

word technology appears here with a strong link to art or technique, as it deals with the rules that govern such tasks.

Ortega & Gasset (1941) considered that “Subject to be ardently discussed in the coming years is that of the advantages, the threat, and the limitation of technology” (p. 87). The author began his first lesson of a course developed in the year 1933 at the Summer University of Santander with this statement, which was subsequently published as a text called *Man the Technician* (Buenos Aires, 1939). It is precisely in this paper where his ideas about this “new and gigantic problem” are developed (Ortega & Gasset, 2000).

It is then worth asking: What happens to technique? Why do we have to discuss it? Why does it hang over us like a gigantic problem? Why has it become a growing concern within philosophy? Why does the legitimacy and neutrality of its function within Western civilization suddenly seem so obvious, and we must write about it, even question it? Why do we decide to use it in education and why do some people object to its use in the classroom? Why is it necessary to pose an ethical responsibility in its use in education?

Both Heidegger (1994a) and Ortega & Gasset (2006a) agree that what has happened with modern technique, with technology, is that previously innocent original technique is being repowered in modernity by the λόγος of science. There is a spiral in which science multiplies the capabilities of the technique and, in turn, the new technique multiplies the possibilities of science. It gives way to a sort of infinity and indeterminacy of possibilities by which all the traditional limits of what man can know, can transform, and exploit are broken. That new λόγος of technology is a rationality prevailing in today’s society whereby man becomes aware that he can do what he wants whenever he wants.

When this λόγος of technology makes its respective foray into the educational field, other specific phenomena that similarly become problematic seem to occur. According to Burgos, Rodríguez, Piñeros & Moreno (2018), “science and technology are facts or products that are transmitted to the new generations through education” (p. 16) (own translation), so there is an intrinsic relationship between them, because education perpetuates, transmits the knowledge behind these cultural products.

Sullivan (1983) argues that computers have fascinated us with their efficiency and speed. They impose an instrumental rationality (material cause) on top of the efficient or final cause. It is a runaway technology that remains outside of ethics and moral principles. Franklin (1999) highlights that ICTs have violated the limits of space and time, and have profoundly altered people's relationships with nature, with other people, with their communities, and we may not be prepared for it. Technology is a system, an organization, procedures, symbols, new words, and it is, above all, a new way of thinking that is imposed through it. Hence, we must urgently and seriously think about it.

Gayol & Schied (1997) stress that it cannot be denied that, in technology-mediated distance education, cultural domination of certain groups remains over others due to imperialism, neo-colonialism, marginalization, gender discrimination, ethnic groups and religion, aside from problems of access and technology costs. Teachers have a duty to mitigate this domination through the practice of critical pedagogy, also highlighting indigenous cultures. UNESCO (2013/4) states that the simple introduction of computers or technology in the classroom, is not enough to improve performance and learning. The combination of very varied elements is required, such as teacher preparation.

Likewise, is it not happening in some cases that investment in human resources, in teachers, or in decreasing the number of students per classroom, is even more urgent than investing in ICTs in school? UNESCO indicates that:

In poorer countries, the availability of ICT infrastructure remains a crucial consideration. Many countries cannot yet support widespread computer-assisted learning because schools lack internet access or, in some cases, even electricity supply. But, given the investment required by poorer countries to ensure that all schools have electricity supply or internet access, the use of ICT is unlikely to be as cost-effective as spending more on teachers to reduce class sizes. (p. 293)

Consider, for example, rural schools and high schools in Latin America and the Caribbean, where, for different political, economic or geographical reasons, electricity grids are still not assured: thinking about the introduction of ICTs in these contexts is still premature. Consider the educational

institutions of the large urban concentrations in Venezuela as well, where repeated power failure and for several hours, prevents the stable use of technology for learning.

Finally, Laudadio (2015) emphasizes that the ultimate purpose of education is to train the person to live fully. To do this, we must go beyond the scientific-technical training traditionally held: instead, “an education in human and moral values that builds young people’s confidence, future expectations, and helps each one assume their role in personal growth must be privileged” (p. 167) (own translation). Privileging moral training along with scientific-technical training will result in a better social life, and therefore, in the formation of a better country.

According to everything said so far, the motivation behind this research is in turn framed by the need to carry out a continuous critical reflection on the teaching practice itself, and also on the need to base this practice on solid ethical principles, especially with regard to the use of educational technology. Burgos et al. (2018), admitting the current influence of ICTs on education, affirm that “pretending to transform education by focusing the whole process on ICT use has debatable consequences, and even more when not, enough considerations have been made” (p. 14) (own translation). This chapter is circumscribed in this direction of contributing to the reflection on ICT impact on education.

Hermeneutics in qualitative research

This is a hermeneutical research in which the texts of 20th century philosophers about technique were reviewed. Accordingly, it subscribes to qualitative research in education, which is conceived as an inductive, interpretive, iterative and recurring process, used when it is necessary to further analyze a problem in order to capture the phenomenon holistically (Pineda & Alvarado, 2008). Within qualitative research, the epistemological theoretical perspective or paradigm to follow is interpretivism, which, for Sandín (2003), “develops interpretations of social life and the world from a historical and cultural perspective” (p. 5) (own translation), distancing itself from the natural sciences that seek to explain rather than understand. Text revision led to understand the meanings that the various authors gave to the problem of technique and to generate ethical postulates for its use.

Along with interpretivism, hermeneutics is also used, a philosophical current that has been conceived as a methodological tradition and a method. Hermeneutics is the art of understanding and interpreting. Throughout history, hermeneutics have sustained the basic importance that language has and has had for man. Within language, it is essential to interpret texts, both spoken and written. Moreover, “interpreting seeks the inner meaning behind what has been expressed, while expressing reveals something inside” (Grondin, 1999, p. 45) (own translation), so in that written language there is always a meaning to look for.

In turn, the importance of written text throughout history to convey culture, the ways of thinking of societies and individuals is also highlighted. For Gadamer (2004), in this interpretation, the fusion of horizons between the reader and the text must occur. That fusion of horizons consists mainly of a dialogue that is established between the interpreter and the text, since language is essentially communication. Then, since both the interpreter and the text have their own horizon of intelligibility, that is, their own visions of the world, their own prejudices, understanding leads to both horizons being founded. Finally, the merger occurs when the meanings of the text transforms the life of the interpreter.

To fulfill the purpose of this research, an analytical reading of the works of the chosen authors was carried out first with the purpose of extracting the categories and elements that were considered valuable to support this theory. It became critical reading that led to take a stand on authors’ proposals, and on the subject of technique. Necessarily, the author’s own position is influenced by the readings made on the subject.

Piñero & Rivera (2012) indicate that categorization “can be conceived as a way to relate our data to our ideas about them, and according to that, it is a link that we establish between the text or its fragments and the interpretation we make of it” (p. 125) (own translation), for which we use a code or category that identifies it. According to Martínez (2004):

It includes categorizing or classifying the parts in relation to the whole, describing significant categories or classes, constantly designing and redesigning, integrating and reintegrating the whole and

the parts, as the material is reviewed and the meaning of each sector, event, fact or data (p. 266) (own translation).

Therefore, it is a process that starts as soon as we begin data collection, that is, to select and then read the texts to be interpreted. Once the interpretative work has begun, in the dialectical coming and going of the parts to the whole and vice versa, not only does the categorization occur, but also the hermeneutical circle that philosophers have proposed.

Martínez (2004) points out a practical procedure for categorization that consists of: 1) Transcribing a protocol information, which in our case consists of the pieces of text to be interpreted, 2) Dividing the contents into portions or thematic units, 3) Categorizing, 4) Assigning subcategories, 5) Establishing category axes, 6) Organizing categories, and 7) Establishing links between categories. An example of the categorization of texts used is shown in the following matrix:

Table 7.1
Model of organization of appointments for categorization

José Ortega & Gasset, <i>Meditación de la Técnica</i> . p. 558		
Root category	Categories	Quote or text (translated)
Circumstance Life	Nature Nature reform Supernatural	These are the technical acts, specific to man. The set of them is technique, which we can, of course, define, as the reform imposed on nature in view of the satisfaction of its needs. These, we have seen, were impositions of nature on man. Man responds by imposing a change to nature. Technique is, therefore, the energetic reaction against nature or circumstance that leads to create a new order of nature, supernatural, between it and man.
<p>Interpretation: Ortega offers a definition of technique, highlighting that it is the effort of man to reform nature. By reforming nature, man builds the supernatural that consists of an artificial human world, through which he isolates himself from the natural world.</p> <p>This is in close relationship with other ideas of the author, such as the idea of circumstance and the idea of life. It is also related to the idea of basic needs.</p>		

Note: Matrix by Rojas (2018) based on texts reviewed.

To organize the categories and establish links between them, it was decided to use large topics related to technique, which sought to collect and compare the texts of the selected authors. These themes are a) What technique is; b) Technique from a historical perspective; c) The dangers and benefits of technique; and d) Attitude towards technique. The main reference texts are: *Meditations on technique*, published as an article in a 1939 book by Ortega & Gasset; *The question of technique* published by Heidegger in 1954; and *University in the Technological World* of Mayz Vallenilla (1974). Without further ado, the texts will be hereby analyzed.

Technique in interpreted texts

a) What is technique: It is a basic question: What is it that we call technique? There are common answers to these questions in previous literature. In the attempt to define it, the authors immediately reveal, not only its very particular definition, but also place it within the thematic concerns.

Ortega & Gasset:

First off, Ortega & Gasset (1941) offers what we could understand as a definition of technique:

Here, then, we have at last the so-called technical acts which are exclusively human. In their entirety these acts constitute technology, which may now be defined as the improvement brought about on nature by man for the satisfaction of his necessities. The necessities, we saw, are imposed on man by nature; man answers by imposing changes on nature. Thus, technology is man's reaction upon nature or circumstance. It leads to the construction of a new nature, a supernatural interposed between man and original nature (p. 95).

Technique is the reform that man makes to nature to meet his needs. Remember: the natural non-human world, the wild world, is difficult to live. Faced with these difficulties, man responds by changing nature, and turning it into a supernatural. In this paragraph, we can extract some very interesting categories, such as: a) **nature**, which constitutes the world that is given to us, b) **reform to nature**, as a synonym for technique, representing the human action that transforms that initial world given, and finally, c) the **supernatural nature** that man creates from technical action.

Regarding education, technique completely overcomes the barriers of the circumstance, e.g., having a class session online with a teacher located hundreds or thousands of kilometers away. But we can also reflect on the levels of technological dependence in our educational world: it is truly difficult today to be able to educate without having Internet access, a computer, a printer, telecommunications and social networks. These technologies have become increasingly essential for the teaching-learning process.

Heidegger:

Another interesting definition is offered by Martin Heidegger, (1994a) who distances himself from the traditional concept of technique, and rather looks for it in the Greeks:

But where have we strayed to? We are questioning concerning technology, and we have arrived now at *aletheia*, at revealing. What has the essence of technology to do with revealing? The answer: everything. For every bringing-forth is grounded in revealing [...]

Technology is therefore no mere means. Technology is a way of revealing. If we give heed to this, then another whole realm for the essence of technology will open itself up to us. It is the realm of revealing, i.e., of truth (p. 12).

In the author's search for the essence of technique, Heidegger manages to link it then with the creative potential of poetry (poetry), which is the bring-there-ahead, and with the unveiling or concealing of the truth (*aletheia*). Poetry and truth would be two important categories that arise from his conception of technique. With this linguistic turn, Heidegger manages to clarify a beneficial link between poetry (art), truth and technique. As for *aletheia* (truth), technique is to unhide. But the way to uncover it is the *Ge-stell*, and that literally has been translated by imposition, device, or also by structure of site or shelf where stocks are collected in a warehouse:

Enframing means the gathering together of that setting-upon which sets upon man, i.e., challenges him forth, to reveal the real, in the mode of ordering, as standing-reserve. Enframing means that way of revealing which holds sway in the essence of modern technology and which is itself nothing technological (p. 20).

What this term attempts to designate is a kind of impersonal will or a generalized cognitive structure that dominates everything in our time. It is the empire of calculus, which sees everything as an exploitable resource. In sum, it is a technological attitude towards the world that in Heidegger assumes a profound ontological character when inserted into the history of being forgotten (Mitcham, 1989).

Based on Heidegger's definition, three relevant categories can be extracted: *Ge-stell*, as a site structure, which refers to a mentality that sees every entity in the world as an exploitable resource; to **undisguise** or reveal the occult, which is an ontological category that refers to the truth, in the way of revealing the Being shown in the entities; and finally, **provocation**, referring to the fact that man is provoked or forced to see everything with a technical mentality.

The technical view to which Heidegger refers applied in education could be that which leads us to look only at the quantitative aspects of it, while leaving aside other existential dimensions of the human beings that participate in it. The technical perspective focuses on the parts rather than whole, that is, on technical procedures, the technical conception of teaching, while ignoring educational contexts and needs. This can be evidenced in planning, strategy, evaluation and educational research.

Mayz Vallenilla:

Another relevant author is Mayz Vallenilla (1990), who distinguishes the concepts of technique and meta-technique. Recently, the technique has made a qualitative leap and has become meta-technique, which is the current technique:

In the face of this modality hitherto prevalent in technique –of anthropomorphic, anthropocentric and geocentric style and limits–, a new project and model of whose logos intends to transform and transcend those limits begins to be suggested in our own time (modifying *eo ipso* [for themselves] the purposes of the traditional technical task), seeking to increase the power available to man beyond the borders imposed by his original somato-psychic constitution and the parallel

cognitive capacity sustained by it. This is what the author refers to as meta-technique. (p. 15) (own translation).

In this new time of technique, meta-technique has surpassed its human and anthropocentric configuration, to give way to instruments, procedures and, in general, a mentality characterized by limitlessness. Therefore, according to Mayz Vallenilla, they are trans-human and trans-finite instruments that overcome the spatial-temporal optical-enlightenment rationality that had shaped all the Western technique and culture so far. Of course, the ultimate goal of meta-technique is power, granting it increasingly to man, an unlimited force to which people are not used to –atomic energy is a clear example of this.

The categories extracted from these texts are: **domain**, which refers to the will of power man exhibits through technique; **otherness**, which refers to everything other than the self, other men and all other entities in the world; **anthropocentrism** and **anthropomorphism**, which refers to the purposes to which the past technique tended, but whose limits were exceeded with the new technologies; and **geocentrism**, which also referred to the technique of a few years ago where we were confined to Earth.

Mayz Vallenilla (1972) emphasizes that we could be living in an underdeveloped country that continuously receives the technical incentives of an alien post-industrial society. The risk of uprooting our ethos is evident. This regards technological colonialism or technocratic imperialism. It invites educational institutions to train their graduates by warning them. The values with which the current technical rationality aims to train our citizens do not convince us. It is an attitude that opposes the contemplative attitude and respect for the environment, natural to our Latin American continent.

b) Technique in historical perspective: some writings tend to reflect on the development of technique in history. The three chosen thinkers point out that, in modern technology or technique, something worrisome is arising.

Ortega & Gasset:

Ortega argues that there are three major phases in the evolution of technique: 1) The technology of chance, 2) the technology of the craftsman

and 3) the technology of the technician. The technology of chance is characteristic of primitive man and “It does not occur to him that technology is a means of virtually unlimited changes and advances”. (1941, p. 143). The second stage is the technology of antique craftsman groups and Middle Ages technique. “It has become necessary for a definite group of people to take them up systematically and make a full-time job of them. These people are the artisans. (p. 146).

The categories that can be extracted from the first phase proposed by Ortega & Gasset are **chance**, ignorance and limitations. The first refers to the fact that the technical action of man is not the result of premeditation but of random discoveries. **Ignorance** refers to man not being aware of the transformation potential in his hands and does not know what the technique is. And, finally, **limitation** means that the technical capacity of man is limited. From the craftsman phase, two categories can be extracted: Specialization refers to the ability derived from people who dedicate their lives to the trade, which makes them specialists. **Skill** is related to craftsmen’s technical skill.

The third phase regards the technicians’ technique, and describes the moment in which humanity has lived for the past two centuries due to the use of science:

We have called it «the technology of the technician». Man becomes clearly aware that there is a capacity in him which is totally different from the immutable activities of his natural or animal part. He realizes that technology is not a haphazard discovery, as in the primitive period; that it is not a given and limited skill of some people, the artisans, as in the second period; that it is not this or that definite and therefore fixed “art” but that it is a source of practically unlimited human activity. (pp. 149 – 150).

According to Ortega, this puts man in a «tragicomic» situation: we are aware of the ability we have to achieve whatever we might conceive, yet, we are also terrified of our own potential.

The categories derived are: **Limitlessness** consists in man’s infinite capacity for creation through technique, which keeps man troubled for not

knowing what to do with so much power. **Science** refers to the rigorous and methodical knowledge that attempts to establish the laws that govern reality. Finally, the **method** can be understood as a path or set of procedures that are intentionally directed towards a specific purpose.

In this classification, Ortega acknowledges that something has changed in this last technical phase. It is no longer the same as before. Recent use of modern information technologies in education marks an unprecedented milestone in the history of pedagogy and differentiates it from the past: the limits to learning have faded away; learning can take place without barriers, e.g., space or time; there is no need to share the same time or space as the teacher, etc. Over time, machines will be able to fully handle human training, which raises new ethical questions, unthinkable a few decades ago.

Heidegger:

Heidegger also discriminates between periods or phases regarding technique and distinguishes between technique as thought of by the Greeks, artisanal or manual technique, vs. modern technique: “It is said that modern technology is something incomparably different from all earlier technologies because it is based on modern physics as an exact science. (1977, p. 14). Heidegger clarifies there is a fundamental and reciprocal influence between exact sciences or research and modern technique. Furthermore:

The revealing that rules throughout modern technology has the character of a setting-upon, in the sense of a challenging-forth. That challenging happens in that the energy concealed in nature is unlocked, what is unlocked is transformed, what is transformed is stored up, what is stored up is, in turn, distributed, and what is distributed is switched about ever anew. Unlocking, transforming, storing, distributing, and switching about are ways of revealing (p. 16).

The text makes a claim towards modern technique: man provokes nature, forces it to offer all kinds of resources that are then transformed, stored, distributed and, then, again transformed. With the new technique, the world around, nature, is a warehouse from which resources are acquired in an unlimited way, even if we don't need them.

The categories that are extracted are: **Cultivating**, which is the previous form of technique that consisted of sheltering and taking care of the land. **Science**, which is a rigorous and methodical knowledge, that attempts to establish the laws that govern reality. The Heideggerian category of **provocation** reappears, referring to the fact that man is provoked or forced to see everything with a technical mentality. And, finally, the Heideggerian concept of **unconcealing** or revealing, an ontological category –that is, linked to the problem of Being– which refers to the truth in the way of unveiling the Being shown in the entities.

Heidegger's claim towards the exploitative mentality derived from technology could focus on a lucrative use of educational technology. By cancelling space and time limitations with new learning systems based on information technology, profits have increased, since it is no longer confined to a country, region or language. The legislation that regulates this new way of educational work may not have reached the appropriate maturity to establish the necessary boundaries. Hallak & Poisson (2007) also warn on another example of this exploitative mentality: fictitious universities have multiplied worldwide, giving way to activities such as smuggling of false diplomas, degrees or credentials, which has resulted in educational fraud mediated by technology.

Mayz Vallenilla:

According to Mayz Vallenilla (1990), initially there was the traditional technology:

Nature was then interpreted as an extension of man himself and his needs. Our possibilities and limits were consistent with it. Therefore, technology assumed an exclusively geocentric significance and its presumed purposes were explained primarily with the help of anthropomorphic and anthropocentric concepts and schemes. (p. 14) (own translation).

The derived categories are: **Optical-enlightenment** and **space-time logos**, that is, a rationale based on anthropomorphic and geocentric categories; anthropomorphism, which indicates that technical artifacts and products are an extension of human capabilities. Another relevant category

is **geocentrism**, which refers to the confinement of technical development to a range of action within our own planet.

Currently, a new rationality or phase is found, called meta-technique:

One of the most peculiar features of the meta-technique lies in its attempt to create or produce a modality of logos or non-human thinking –trans-human, meta-human– whose forms, laws and principles are not identical or similar to those that inform and sustain human discourse. Not only the variation, modification or alteration of the constitution and functioning of the cognitive sensory of man is used to achieve this purpose, but also their replacement by instruments or devices whose mechanisms and operations can be eliminated or replaced, consequently producing a logos or meta-human thinking –not anthropomorphic, anthropocentric or geocentric– whose correlates form a trans-human and trans-finite otherness. (p. 5 - 6) (own translation).

The new meta-technique, unlike traditional technique, does not have man, nor the human senses, specially sight, as a point of reference, on the contrary, it tries to overcome them. Therefore, the text highlights that its modality is trans-human, meta-human, trans-finite and the rationality or logos that it brings is also foreign to the anthropomorphic.

The categories derived here are: The trans-human or **meta-human logos**, which indicates that the new technique completely transcends the rational and epistemological patterns assigned by man. Similarly, **trans-human and trans-finite otherness** refers to a kind of technical entities that also surpass the traditional canons of man-made objects. All this gives way to a new **trans-reality**, which also far exceeds reality, which we know little or nothing of.

New technology that permeates everything is not simply a new learning resource that was introduced in classrooms. At times, it seems the machine is the classroom, the teacher, the classmate, the text, and the resource. We are then introduced to a new world that we were not used to, a new technological trans-reality. The risk of it getting out of hand is always latent. We will have to take charge of the matter, understand the

phenomenon and build conceptual and procedural tools that allow us to keep control of education in new technology-filled scenarios.

c) The dangers and benefits of technology: The different assessments that the chosen authors have been making regarding the hazards and profits of technology are gathered. That should prompt us to consider that this task is not neutral, and deserves to be thought of.

Ortega & Gasset:

According to Ortega & Gasset (1941) the third phase represents a real danger. Holding on to a single point of view in the matter, rather than understanding the relative meaning of current technology is a big problem:

I have opposed this tendency and embedded our present technology, as one among many others, in the vast and multiform panorama of human technology in its entirety, thereby relativizing its meaning and showing that every way and project of life has its corresponding specific form of technology. (p. 138).

A wider mindset is needed, and understanding that technology is not everything or the most important thing, as well as avoiding the danger of thinking the human world is the only thing there is: Man humanizes the world, which could become saturated with man, and human offspring could walk on it as we mentally walk now through our intimacy (2006b, p. 537).

Technological transformation on the world is so incisive that we could come to believe that humans are the only things that exist. In fact, lifestyles in the big cities show this. But it is precisely that supernatural nature that saves men, by granting enough resources to face environmental challenges to complete their own life projects.

Some of the categories that can be extracted from Ortega & Gasset's texts are: **Technique relativity**, which implies that Western technique is only one of many possible, and depends on life projects each society has chosen. **Fear**, individual or societies' attitude of suspicion towards the technique. **Claim of antonomasia**, or the belief –common in current wes-

tern thought— that our technology is the only one and the best, whereas it is typically relative. **Alteration or animality**, the risk of living outside oneself. **Supernatural** refers to the artificial world saturated with man that is built by man himself through technique. **Limitedness**, the infinite possibilities of the technique, which can in turn lead to emptiness. **Emptiness**, or the lack of human sense, caused by a life altered by technology. **Comfort**, the supernatural socket that technique offers men to be themselves.

The emptiness, product of the technical mentality, can be denoted in the educational field in didactics, i.e., strategy, planning and evaluating. Teachers use certain technologies driven by trends, peer recommendations or personal attraction towards them, but not because of a serious meditation on the matter, or a conscious diagnosis of students' needs. Teaching is then carried out, but with an emptiness of meaning, devoid of intentions.

Heidegger:

Heidegger (1977) sees a serious risk in the essence of technique, which he describes as:

Since destining at any given time starts man on a way of revealing, man, thus under way, is continually approaching the brink of the possibility of pursuing and pushing forward nothing but what is revealed in ordering, and of deriving all his standards on this basis. Through this the other possibility is blocked, that man might be admitted more and sooner and ever more primally to the essence of that which is unconcealed and to its unconcealment, in order that he might experience as his essence his needed belonging to revealing (p. 26).

According to this, the danger of unconcealment is the risk of unilaterality, that men take it as the only one possible and chase away other ἀλήθεια [aletheia, truth] possibilities. Every act of revealing, as a destiny of being, is dangerous, yet, in the case of technology, it can be considered *the peril*. Man is also in danger of losing his roots and his characteristic way of being: living. Technological advances homogenize everything, including the land in which man inhabits, obfuscating the relationship of man with his native soil.

But technology also has benefits: its essence needs to be addressed. If it is taken care of, proximity to danger will make people see the roads that lead to its benefits. Heidegger saw:

I see the situation of man in the world of planetary technicity not as an inextricable and inescapable destiny, but I see the task of thought precisely in this, that within its own limits it helps man as such achieve a satisfactory relationship to the essence of technicity. (1981, p. 61)

Thought could lead to understand the damages of technological unilaterality and to conceive it, not as an absolute, but as another way to make the truth clear. In this case, the savior of the technique is that the devastating of itself must motivate us to seek solutions. In this case, the technological benefits that rise to the rescue are precisely born from the need to seek solutions in the face of the dangers that technology poses.

The categories derived from this section are: **Unilaterality**, to denote the fact that the technique tends to be affirmed as the only way of truth, or access to the entity. Concealment, since the technique **hides the Being** because it only considers them exploitable entities. **Uprooting**, because the technique tends to destroy the environment, and erases the cultural roots of man. **Thinking**, an activity inspired by technology, which leads people to explore its saving benefits. And, finally, **art and poetry**, related to technique's origin, yet different human expressions in the world.

It is a fact that the use of technology as an ally for education is a phenomenon in today's society, which is practically widespread and increasingly growing. According to Heidegger, perhaps, so that the savior benefits flourish in it, it would be convenient to create spaces of reflection mediated by technology (courses, diplomas, blogs, discussion groups, etc.) specifically dedicated to thinking about its desired use. Spaces in which students and teachers, or staff in general, express their ideas about it, how they feel when interacting with machines, its correct use, etc.

Mayz Vallenilla:

According to Mayz Vallenilla, the problem of technology is eminently cultural, of omni-comprehensive colonialism:

Technique or the technified existence is a project that homogenizes man, while the world designed is an anonymous and common universe, within which the intramundane entities, including man himself, appear and are seen as appropriate tools. (1974, p. 98) (own translation).

The dangers become evident: with technology, everything becomes homogeneous, including man; everything is anonymous and loses its own worth, its essence, since from then on, the entity is valid because it is a useful instrument for the technification of the universe. Yet, Mayz Vallenilla also considers there is an emerging savior in the current work of science and technology, which has to do with the emergence of a new humanism, universal political. He explains that through the work of science, specifically through technology, the world has become a universal dwelling place of man and the earth as a whole has become the planet we inhabit in common (1967, p. 38).

Technology has not only helped us transform the environment and helped us turn it into our particular habitat, it has also opened out horizons and show us we are inhabitants of all the earth.

Regarding categories, there are: The **homogenization** of man, operated by technique, stripping him of his nativeness and making him anonymous. The **instrumentalization** of the entity and of men, making them a means for the total technification of the universe. The **anonymous universe** built by technical work, causing man to lose his roots and his essence. The **imposition**, while the technique is given to us from the outside, we are not its creators, and we are dependent on it. And finally, the **universal political humanism**, which would be the savior of the technique, because it has pushed us as a species to a greater awareness of the objective and universal value of people.

Regarding homogenization, the technology we use, equipment and software come from cultures outside our own, designed for contexts other than ours, usually elaborated in the English language, as well as most resources available on the Internet. We have no choice but to adapt to the culture where technology originates. Such cultural infiltration takes place

from the very context of the classroom. That is when technology homogenizes us and adapts us all to take the form and aspect of the dominant culture.

d) Attitude towards the technique: It is relevant to read and interpret the authors' recommendations offered on what our attitude towards technology should be, and their recommendations for the human race to face this task, which is the product of our own rationality and doing.

Ortega & Gasset:

Ortega & Gasset invites "to suspend action in order to review our ideas and forge a strategic plan" (2006a, p. 547) (own translation). That is why perhaps at the end of *Man the Technician* he provocatively suggests that Western culture will have to take more notice of Asian soul techniques:

But human life is not only a struggle with nature; it is also the struggle of man with his soul. What has Euramerica contributed to the techniques of the soul? Can it be that in this realm it is inferior to unfathomable Asia? Let us conclude our argument with opening a vista on future investigations which would have to confront Asiatic technologies with those of Western civilization (1941, p 161).

An invitation underlies in this thought: to contemplate reality as whole, and acknowledge that man is made of body but also soul. Our current technique has very little to say about the soul. To promote only the material is to stunt human life, which cannot be reduced to the struggle with matter.

The derived categories are: **Self-absorption**, which is the opposite of alteration and consists in suspending pure action to dedicate ourselves to thinking and reflecting on ourselves. **Wholeness perspective**, which regards understanding that the technical outlook is not the only one and that human life dimensions are diverse. **Panoramic and synthetic education** in schools and universities, which tends towards a holistic, trans-disciplinary conception of the phenomena. Finally, **soul techniques**, which invite to look towards other techniques, such as oriental techniques that revalue other dimensions of man, such as the spiritual or religious dimensions.

The divorce between the knowledge acquired and the context has been a problem for several years in various countries. There is no doubt that the search for the link between theory and practice, and for people's integrality will bring numerous benefits to society. Following Ortega & Gasset's idea, as Euramérica should look to other horizons of the world, could it not be that a new way of grasping the technique, more coherent with its original entity, could arise from Latin America?

Heidegger:

According to Heidegger (2001), the fundamental structure of man is «Being-in-the-world», which implies that we have an essential relationship with our surroundings, and that we are that relationship. Resorting to German etymologies, Heidegger finds that “being” is the same as “living”, so living is our essential way of being. Therefore, we do technique. People do not inhabit because they have built, rather they built to the extent that they inhabit (Heidegger, 1994b). Technique makes the world inhabitable through building is part of our essence, but that inhabiting is not destructive, on the contrary, it shelters and cares for the world and its people, in its own dynamism. The necessary attitude towards technique then, is the attitude of inhabiting, which is in our own essence.

Heidegger argues that the technical task has not been directed with this attitude of living respectfully of the environment, but with an exploitative mentality. Since technology has become indispensable in current quotidian life, he recommends a more proper attitude: Releasement [*Gelassenheit*]:

We let technical devices enter our daily life, and at the same time leave them outside, that is, let them alone, as things which are nothing absolute but remain dependent upon something higher. I would call this comportment toward technology which expresses “yes” and at the same time “no,” by an old word, *releasement toward things* (1966, p. 54)

Releasement is to know how to accept or deny technology in appropriate amount, not letting ourselves be dragged by it, or that its use becomes inevitable to us.

The prominent categories in this section are: “**Being-in-the-world**”, which is our fundamental way of being, of living in the world. To **inhabit**, that is our existence and the way of relating to the world. To **build**, which is the technical action that respects the environment, sheltering it and taking care of it, which leads us to live. And **releasement**, as the attitude of accepting or refusing, or general detachment from technological advances.

Heidegger’s releasement proposal becomes more urgent the more we become dependent on technology. For instance, the time spent on a smartphone and its multiple and colorful features, to a point where people can no longer live without it. It is also clear that we have become increasingly dependent on technique in education. Releasement should lead to rational benefits from these technological resources and, at the same time as good teachers, always have a plan B, be prepared for when technology can fail, or when historical-social circumstances lead to a scenario in which suddenly technology becomes unavailable.

Mayz Vallenilla:

For Mayz Vallenilla (1972), man must be characterized by reflexive and critical meditation. Given the novelty of the technique, and at the risk of appearing redundant, we must innovate. He considers this a special task in the field of education; given technology has a very important role training and modeling people. Innovation means to question the technique and the technified education in its own foundations with the express purpose of modifying its effects and projecting the meaning of the formative work towards new paths and horizons, more varied than the pure technical reason prevailing today.

Among the categories that can be extracted from these and other texts are: **Innovation**, which means critically questioning the technique and its novel artifacts, from education. **Interdisciplinarity and Transdisciplinarity**, as a new way of building knowledge in the university and setting hyperspecialization aside. **General and humanistic studies**, a new training in which to prepare professionals to face the complex problems of today’s society. **Human dignity**, as the ideal people that must be rescued

by society, as a means to an end that brings technical reason with it. **Understanding**, what is the technique, what is its ontological basis.

It is a serious effort to understand what the technique is, what is its foundation, its essence and where it is going. These reflections are this chapter's invitation in the context of technological uses in the classroom. The purpose would be to find a new ontological foundation for the technique that no longer leads to mere human domination, but to rescue the true value of people. Next, a matrix gathering all extracted categories is shown.

Table 7.2
Synoptic matrix of the categories found

Topic	Ortega & Gasset	Heidegger	Mayz Vallenilla
What technique is	Reform of nature	<i>Ge-Stell</i>	Domain
	Supernatural	Provocation	Anthropomorphism
	Nature	Reveal	Otherness
		Poetry	Geocentrism
		Truth	
Technique in a historical perspective	Ignorance	Cultivate	
	Chance		
	Limitation		Anthropocentrism
	Ability		Optical-enlightening logos
	Especialization		Geocentrism
	Science	Science	Trans-human and meta-human logos
	Method	Provocation	Trans-human and trans-finite otherness
	Limitedness	Reveal	Trans-reality

Topic	Ortega & Gasset	Heidegger	Mayz Vallenilla
The dangers and benefits of the technique	Relativity		Anonymous universe
	Fear		
	Claim of antonomasia	Unilaterality	Homogeneization
	Alteration or animality	Concealment	Instrumentalization
	Limitedness		
	Emptiness	Uprooting	Imposition
	Supernatural	Thought	Universal political humanities
	Comfort	Art	
		Poetry	
Attitude towards the technique	Absorption	Being-in-the-world	
			Interdisciplinarity
	Wholeness perspective	Inhabit	Transdisciplinarity
	Panoramic and synthetic education	Building	General and humanistic studies
	Soul techniques	Releasement	Comprehension
			Human dignity

Note: it has been attempted to locate the categories of each author in line with the categories of the other authors with whom it is related. Content by Rojas (2019) based on documentation review.

Ethical postulates

Here, an ethical theory attempting to guide how human relationship with technology should be is outlined. It is a proposal on how technical actions in education should be. This is the fusion of horizons proposed by Gadamer (2004), which is a dialogue established between the interpreter and the text. First, the interpreter recognizes their own horizon in this dialogue, which is their context, training, and concerns. Then, the interpreter tries to decipher the author(s)' horizon, which was carried out in the previous section. Then the dialogue, the fusion, of horizons begins as the

meanings of the text transform the interpreter's life and worldview. This is what Gadamer (2004) calls the application.

The specific way in which this section is structured is through postulates or affirmations. According to Ferrater Mora (2004, p. 2860), Aristotle defined postulates as not universally admitted or self-evident propositions. Unlike axioms, they were rather held in relation to other approaches previously based and denoted no claim to universality.

The categories found in the authors' texts are inspiring or permeating the construction of this theory. In table 7.3, there is a new summary of such categories in connection with the postulate to which they originated. Of course, this will reveal new connections between categories emerging from the texts of different authors.

Note that the distribution of categories used is not proportional or symmetrical, but that it responds to the author's interests as an autonomous researcher, and to the capacity perceived in each category to provide a foundation for the postulates that are being proposed. The postulates are: 1) We are humans, not gods; 2) Being prevails above possessing and being useful; 3) Promoting a culture of austerity, not of consumption or discard; 4) Technique is at the service of living; 5) There are fruitful relationships between art, poetry and technique; 6) An increasingly humane and comprehensive education is urgent; 7) Technique must lead the way to transcendence.

Table 7.3.
Categories that support the postulates

Postulate	Ortega y Gasset	Heidegger	Mayz Vallenilla
We are humans, not gods.	<ul style="list-style-type: none"> Limitedness 	<ul style="list-style-type: none"> Cultivate 	<ul style="list-style-type: none"> Domain
Being prevails above possessing and being useful.	<ul style="list-style-type: none"> Nature 	<ul style="list-style-type: none"> Concealment 	<ul style="list-style-type: none"> Instrumentalization Dignity Humana
Promoting a culture of austerity, not of consumption or discard.	<ul style="list-style-type: none"> Self-absorption Alteration or animality 	<ul style="list-style-type: none"> Releasement 	<ul style="list-style-type: none"> Understanding

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Postulate	Ortega y Gasset	Heidegger	Mayz Vallenilla
Technique is at the service of living	<ul style="list-style-type: none"> • Nature reform • Supernatural • Comfort • Emptiness 	<ul style="list-style-type: none"> • CBuild • HInhabit • «Being-in-the-world» • Uprooting 	<ul style="list-style-type: none"> • Anthropocen-trism • Geocentrism • Trans-reality
There are fruitful relationships between art, poetry and technique	<ul style="list-style-type: none"> • Chance • Ignorance • Limitation 	<ul style="list-style-type: none"> • Truth • Reveal • Think • Art • Poetry 	
An increasingly humane and comprehensive education is urgent	<ul style="list-style-type: none"> • Science • Method • Especialization • Claim of antonomasia • Relativity • Panoramic and synthetic education 	<ul style="list-style-type: none"> • Unilaterality • Provocation 	<ul style="list-style-type: none"> • Homogeneization • Interdisciplinarity • Transdisciplinarity • General and humane studies
Technique must lead the way to transcendence	<ul style="list-style-type: none"> • Absorption • Wholeness perspective • Soul techniques 		<ul style="list-style-type: none"> • Humanism Universal Political • Human dignity

Note: The categories were located in line with the substantiated postulate. Matrix by Rojas (2019) from texts revision.

- a) We are humans, not gods: “We are not God. The earth precedes us and has been given to us”. Thus, begins paragraph 67 of Pope Francis’s (2015) Encyclical Letter *Laudato Si* (Praised be [my Lord]) published. In the context of that phrase, the Pope calls upon humanity, because although according to the Bible, God has asked man to support Him in creation, we are not allowed

to do everything regardless of other beings of nature. We are invited to till and take care of the earth, to protect and make life grow; that is the call to supporte creation.

A first ethical postulate that has seemed pertinent to the technique flows just along that same line. We are human and not gods; not everything is allowed. And there are several categories that emerged from the texts studied that led to this reflection. Some categories leading to this postulate were: Ortega & Gasset's **limitedness**; Heidegger's *Ge-stell*, and **cultivate**; and Mayz Vallenilla's **domain**.

This postulate seeks to raise awareness that it is sensible to set limits to the power of technique. It also responds to the conviction that every technical action of man, as it is a free choice, entails consequences and ethical responsibilities. Not everything that is technically possible is a necessity. It is desirable to think carefully about what should or should not be created, according to real needs.

Consider the use of certain innovative technological resources in education. The advisable thing would be that people in charge of decision-making regarding technology to be used have enough time to assess the options, to plan, execute and then evaluate the performance and the lessons learned. But the whirlwind of available resources, its outdated and immediate replaced by other more advanced versions, plays against deliberation and option assessment, as well as on the evaluation of experiences carried out. Decision-making cannot be the result of mere technological trends nor be based on the pressure of regional or worldwide academic environments.

- b) Being prevails above possessing and being useful: the German Episcopal Conference issued a statement on the environment and energy supply entitled *Zukunft der Schöpfung – Zukunft der Menschheit* [The Future of Creation - The Future of Mankind] in 1980, which addressed issues related to technique as human activity, energy and the environment. It declares that sometimes we run the risk of valuing people, and everything else, only for their usefulness. It goes on to state “the primacy of being over

having regarding people, and the primacy of being over being useful regarding non-human creation” (1980, p. 9) (own translation).

Hence, the idea of this second postulate: to have a proper relationship with technique, it is necessary to keep in mind the priority of being over having and being over being useful. There are several categories on which this proposal is based: Ortega speaks of **Nature**; Mayz Vallenilla of **Instrumentalization**, and of **Human Dignity**; and Heidegger highlights **Concealment**.

An ethics of the technique must lead to recognize that a person's being, and that of all entities, is above their possessions, their function or utility in the plot of technical relations of the social fabric. Human dignity is the highest value, which should be cultivated and defended, rather than valuing the technical objects possessed. The rest of nature's entities also already have an intrinsic value given their existence, even if they do not provide people with immediate technical service.

Regarding educational technology, we must renew people's preeminence over things. For instance, often, in technology-mediated learning environments, it is hard to communicate our emotions, our feelings, our body language, which are fundamental in human relationships, in communication, and of course, in teaching and learning. An alternative to mitigate these deficiencies is the use of videoconferences in which part of these fundamental human experiences can be captured. The solution is to try to find innovative alternatives in technology that allow us to express ourselves in the most transparent way possible so that our interlocutors can perceive us as we are.

- c) Promoting a culture of austerity, not of consumption or discard: Adela Cortina (2002) states that “equal access to consumer goods is a pending ethical task, which cannot consist in universalizing the «American dream», because the people nor the earth would resist it” (p. 231) (own translation). For consumption to be truly human, it must be autonomous, fair and granting. Autonomous: that is, without coercion of advertising. Fair: that our consumption pattern be universalizable to all without depleting the plan-

et's capacity. Granting: that consumption leads us to achieve our goals of happiness.

The third postulate proposed is linked to Cortina's: a culture of austerity is necessary in the use of technology, which may surpass the drives of consumption and shedding. Related categories are Heidegger's **Release-ment**; Ortega & Gasset's **absorption** and **alteration or animality**; and Mayz Vallenilla's **Understanding**.

The postulate suggests that austerity, a control of the culture of consumption and discard, is necessary in our relationship with technique. Current technological society is highly consumer of itself. Being at the forefront of technology means being willing to continually buy, use and discard. The technological world forces us to shed obsolete software, old cell phones, previous generation computers or tablets, lower resolution TVs, not only because equipments have very short lives, but also because even if we take care of them, and these continue functioning, they are no longer compatible with the new features of the global connection system.

Training and education in virtues and values that fosters a culture of austerity in the face of technological advances is therefore necessary. This new attitude can even be fostered from the technology-mediated learning spaces: an attitude of releasement towards new artifacts and overwhelming advertising. You don't have to buy all the new equipment available. This could be through a course in technology, ethics or social issues arising from technology use. This type of course could warn of what Pope Francis calls «rapidation» (2015, p. 17), referring to the continuous and vertiginous changes to which technological and consumer society lead us. Another fundamental aspect derived from this postulate is the need to train for freedom. School and the universities have a duty to train citizens, that is, free people.

- d) Technique is at the service of living: “God blessed them, saying to them, «Be fruitful, multiply, fill the earth and subdue it. Be masters of the fish of the sea, the birds of heaven and all the living creatures that move on earth»” (Gen 1:28). “Yahweh God took the man and settled him in the Garden of Eden to cultivate and take care of it” (Gen 2:15). The book of Genesis highlights

the command of God to man to settle on earth, to fill it as a species, but at the same time, to cultivate it and, above all, take care of it. In short, God calls man to inhabit the Earth, establish our abode in it, our home. When we live in a place, we don't destroy it, we embellish it, to make it a pleasant place.

The fourth postulate arises from this conviction: the technique must lead us to human habitation. If the opposite occurs, then it fails to fulfill her primary function. The categories that inspire this postulate are Ortega & Gasset's **Reform of nature, supernatural, comfort and emptiness**; Heidegger's **building, inhabiting, "Being-in-the-world"**, and **uprooting**; and Mayz Vallenilla's **anthropocentrism, geocentrism, and trans-reality**.

This postulate invites us to become aware that the purpose of the technique is to inhabit, that is, to produce a habitable place for man, in the midst of a nature that offers facilities and difficulties. The technique provides us with the means to build our dwelling, our home, our shelter. But the search to inhabit through technification has led us to the opposite: to uprooting, to the loss of our roots, to disconnection with the earth, to the gradual destruction of our dwelling: the world. Technology may be emptying our meaning, emptying our being.

It is curious that etymologically the word "ethical" comes from the Greek expression $\eta\theta\omicron\varsigma$ [ethos], which means character or mode of being, but also dwelling on where it is inhabited. Thus, living is linked to ethics, and García (2015) highlights the importance of this relationship. For a healthy living we require a solid formation in virtues and values on the adequate use of technology, a continued reflection on our action that allows us to understand that our dwelling cannot be destroyed, on the contrary, it need to be maintained, cultivated, and protected.

In this same sense, the increasing technification of education has been contributing to the construction of a parallel world within the human realm: virtual reality, which would be the new artificial environment generated by computers, and in which human beings increasingly enjoy being immersed in. A critical ethic from education should aim to generate spaces for discussion in which this fact is reflected. In many ways, the virtual reality generated by technology is replacing the real world of traditional in-

teractions between human beings and their environment. Are we prepared for that? Do we have control over the consequences of this new reality, of this trans-reality? Does this trans-reality really lead us to human habitation, or does it uproot us?

- e) There are fruitful relationships between art, poetry and technique:

“Man in vain attempts to bring the globe in order
through his plans whenever he is not in harmony
with the message of the Fieldpath.
The danger threatens that men of today
remain hard of hearing to its language.
They have ears only for the noise of the media,
which they take to be almost the voice of God.
So man becomes fragmented and pathless”.
(Heidegger, 2003. p. 37)

This extract from a poem by Heidegger in *The Fieldpath* (2003) refers to a path that the philosopher often traveled, which goes into the countryside of Freiburg, and then turns towards the beautiful forest of the Black Forest. Along the way, the centuries of human action are represented in harmony and mutual belonging to nature, but they come to be interrupted by a modern technical action that advances the sweeping of the natural world.

The poem and its content set the ground to raise the fifth postulate: poetry, art and technique must be articulated for mankind and the world to survive. The categories that have served as foundations are Ortega & Gasset's **Chance, Ignorance** and **Limitedless**; and Heidegger's **Truth** and **Disregard, Think, Art** and **Poetry**.

Ever since the Greeks, poetry, art and technique have been united through craftsmen who were people with artistic-technical skills and abilities product of their own manual experience. This link reaches its peak in the Renaissance. Leonardo Da Vinci is a clear example of a craftsman who knew how to harmoniously combine science, technique and art. According

to Tatarkiewicz (1980) poetry, technique and art take separate paths during the Renaissance with the flowering of science.

Poetry as a literary genre manifests the beauty of the entity through words. Its motivation is basically contemplative or descriptive about our surroundings, or communicative of our feelings. The purpose of art is also contemplative of the entity, of communication of our experiences through plastic, linguistic, sound, bodily resources, etc. The purpose of the technique is to transform reality for utilitarian reasons and is precisely scarce from a contemplative or communicational outlook regarding our more human dimensions. This is where poetry and art can enrich the technical work.

An interesting step in this path is the trend towards transdisciplinarity, which will allow educational institutions to prepare students of different levels, especially for an integral professional level, and not only in technical-specialized training. It would be interesting to offer all students one or several courses regarding the history art, poetry and technique, and the implications they could have on humanity were they to come back together in the construction of our future history.

g) An increasingly humane and comprehensive education is urgent:

Understanding cannot be digitalized. Teaching the basics of mathematics or some other discipline is one thing, educating for human understanding is another. There we touch on the truly spiritual mission of education: teaching understanding between people as condition and protection of humanity's moral and intellectual solidarity. (Morin, 1999, p. 49)

Morin emphasized, among other things, that the primary mission of education is understanding between people. And this is truly pressing when he is convinced that, in the face of multidimensional and complex phenomena and events, we need a way of thinking capable of interconnecting different dimensions of the real. And where the ethical or moral dimension is urgent and fundamental.

This conviction has been the motivation for the sixth postulate of this thesis: Given the multiple facets that make up the real world, we need to overcome the technical vision and open ourselves to a more complex thought. The categories derived from the texts are: Ortega & Gasset's **science and method, specialization, claim of antonomasia, relativity, panoramic and synthetic education**; Heidegger's **provocation**; and Mayz Vallenilla's **homogenization, inter and transdisciplinarity, and general humanistic studies**.

One of the commonplace discussions in the studies texts regards the danger of modern technique as mentality that transmitted to us: it assumes that everything is ours, that it belongs to us and that it is at our disposal. A critical and conscious ethical view should lead us to the awareness that reality goes far beyond human interests, and that entities' existence does not have to be absolutely at the service of man's needs. This means understanding the intrinsic complexity of reality, and realizing that to know it requires a holistic, and not just a technical, perspective. It means realizing that entities are not exclusively at our disposal.

From the field of education, and in order to achieve a more holistic view, universities of technical and scientific tradition worldwide, have begun to include in their curricula compulsory humanistic subjects such as politics, philosophy, literature, art, poetry, religion, personal development or inner experience. Coupled with a greater interrelation or interdependence between the scientific-technical matters, this may lead us in the right direction, yet we still have much to do.

h) Technique must lead the way to transcendence:

It is absurd to think that Joseph was not a good craftsman, reputed both for his skill and for his honesty and righteousness. It was known in Nazareth, and undoubtedly throughout the region, that when addressing him, one was sure to pay a fair price and receive a work well done (Grasnier, 1980, p. 39) (own translation).

Such are the thoughts expressed in the book "Joseph the Silent". Joseph of Nazareth, husband of Mary and putative father of Jesus, knew how to combine his daily work of τεχτων [tekton] (translated as craftsman, builder,

technician, and sometimes as carpenter) with a life virtuous, of intense spirituality. He is described as someone who deserved the privilege of being chosen as the custodian of the Redeemer. Precisely, in that spirituality, in union with God, is the foundation of decent work in the service of the people around you.

This idea has been the motivation for the seventh and final postulate: it is necessary to be open to spirituality and transcendence in technical tasks. Some categories found on the matter are: Ortega & Gasset's **absorption, wholeness perspective**, and **techniques of the soul**; and Mayz Vallenilla's **universal political humanism** and **human dignity**.

This ethical postulate invites us to overcome our technical view of the world and open ourselves to other fundamental dimensions of the human being, such as the spiritual gaze towards the transcendent. Undoubtedly, the technical vision is pragmatic, it is immanent: it is about solving practical problems of everyday life. But it is clear that man has a strong inclination towards metaphysics, that is, the approach and search for answers to radical questions and meaning. If the technique distracts us from asking ourselves these fundamental questions, then it is stunting our radical human being.

However, if with technological assistance, we can pose these and other questions of meaning in the educational field, we can create learning environments where we can speak freely about the spiritual, about the values and virtues that define a holistic human being. Then, the same technology could be freeing us from the purely technical-utilitarian use and opening us to transcendence. Obviously, for many human cultures, the answer of who God is, what reality is, and who we are, is linked to how we should behave and why.

Finally, the transcendent gaze also drives us to openness towards mystery. The technical mentality tries to know everything, explore everything and exploit everything. But it turns out that there is a certain intrinsic unknowableness in reality. There are parts of it that remain veiled to us, and we must learn to live with that. Therefore, this postulate invites us to remain calm in the face of mystery, the supernatural, or the divine. And to

know that sometimes it is enough to face incomprehensible life experiences, where understanding fails to penetrate, with an attitude of admiration and Love, the greatest of virtues.

Final discussion

Regarding hermeneutics within qualitative research in education, the unique, essential, or universal repetitive truths are not relevant. Instead, it aims to know each of the everyday, existential, factual views of each researcher about the universe that gives life to the multicolored human knowledge world. It would be expected that any other researcher-interpreter of the same texts used in this research would develop different categories to those proposed. Likewise, these postulates should also have different meanings for other readers-interpreters of the same books. The seven constructed postulates do not entirely exhaust the richness of the interpreted texts.

As the ethical postulates derived have represented a call for personal transformation as a citizen, a teacher, a student of philosophy, or a human being, it would be satisfying to know if these considerations have also aroused the concern on ethics regarding technology in any reader. Rather than offering answers, the exercise of philosophy lies in posing questions that motivate each person to seek alternatives with conscientiousness. This is also part of the essence of Constructivism in education: more than providing students with the answers, they must be motivated by the teacher to ask questions and look for their answers, becoming the architects of their learning.

Regarding the ethical view that is required in educational technology, it is inevitable to address another side of the technical reality in the Venezuelan context. It turns out that this technique that has helped man build civilization and humanity has been slowly disappearing from Venezuelans' daily lives. Especially in educational institutions, there is a lack of Internet, electricity, telephone network in computers; even paper, books, or the minimum elements for learning are lacking. We are attending an intentional involution of technology in education, and with that, we are pushed to a return to animality, which we had overcome given the comfort technology had given us. People without education are more compliant and malleable to the intentions of the dictatorship.

We hope Venezuelans will soon find the way to freedom, common sense, and progress. If the desired changes occur and the reconstruction of the country begins, we bet on a process of innovation and technological renewal with a more humane and ethical sense. Moreover, we hope schools can lead this citizen-training program that understands the need for ethics in technology use.

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