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Deconstructing the Value-Neutrality of Technology: Why Media Education Should Consider it and Raise Awareness

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Abstract
It is often argued that technology is neutral. Even in the academic world there is still debate today whether it incorporates intrinsic moral values or whether, instead, it all depends on the use that is made of it. In this article this concept will be examined starting from the classification made by Luciano Floridi, in an attempt to dispel this mirage. It will be also discussed why and how Media Education should consider this assumption and include it in its repertoire as a first principle that guides every other reflection and transmittable skill in favor of a conscientization and literacy which it aims to achieve.

Keywords *Technology Value-Neutrality; Conscientization; Media Education; Technological classification*

1. Introduction

The aim of this work is to address a complex issue concerning technology and its possible implications for more accurate media literacy. Starting from an analysis of its classifications, the dynamics by which technologies still tend to be grouped into a single nature and considered neutral by the majority of the population will be explored. Emphasis will also be placed on why it is important for the educational world to take into account these meta-reflections as a basis to provide greater awareness in a global scenario in crisis and increasingly virtual, digitalized and marked by its incessant innovation and spread.

The articulated concept of Value-Neutrality is debated in particular by the philosophical discipline which frames it from multiple lenses and perspectives. In relation to technology, this hypothesis – different from technology neutrality – asserts that

> *"Technology is morally and politically neutral, neither good nor bad; only its uses have moral or other value, not the technology itself"* (Miller, 2021: 54)

In essence, it posits that technology does not embody values and that only human agency is responsible for its status, added values and ethical uses. In the case of the knife, for example, it can be used to peel a food or to harm someone.

Several attempts have been made to demonstrate the absence or presence of value neutrality of technology on the basis of philosophical but also anthropological, ecological (media), psychological or political analysis (Fogg, 2002; Klenk, 2021; Miller, 2021; Pitt, 2014; Strate, 2012; Sundström, 1998; Van De Poel & Kroes, 2014; Verbeek, 2011; Whelchel, 1986) .The aim of this study is to deconstruct the following hypothesis from alternative perspectives and to underscore its relevance and necessity within the context of Media Education.

2. Technology value-neutrality

The key idea is that technologies are not uniform and due to their evolution and ineluctable interrelation with human creation – and creativity – they have taken on a "plus" compared to the past. Paraphrasing and summarizing some concepts of Coccia (2017) who makes a different technological classification, it is possible to understand what could be interpreted as a "technological stratification". In essence, technology and technological artefacts can certainly take on new and innovative aspects and functions, but they are precisely the result of technology within another technology or the elements of one technology in another. Therefore, it is plausible to confirm that modern technologies incorporate the experience, components and qualities of previous inventions. In this case, the investigation of value-neutrality could find its foundation on simpler paths.

A relevant conceptual framework that guides the following analysis starts from (Floridi, 2013, 2017) who taxonomically divides technologies based on some characteristics. These are: 1) First-order technologies; 2) Second-order technologies; 3) Third-order technologies. As he narrates, technology is an entity that is characterized by its “in-betweenness”, that is, by being a sort of intermediary between the user, such as the one who interacts with it, and a prompter – or protocol – namely, the cause and reason why the artifact is created. Therefore, a user can be an individual who uses the “tool” to solve or simplify a problem. An example is the individual (user) who use it to protect himself from the sun (prompter). The prompter is the entity that substantially “suggests” the need for the work to be created. This illustration allows us to clearly introduce what are the so-called “first-order technologies”. These connect the user with a technological artifact in a direct way which in turn puts the user in contact with the natural world. Emblematic examples are the wheel, the plow, the axe, the scissors and so on. This is because, as Floridi highlights, both the interface and the protocol of the instrument are visible and modifiable by the user.

A second-order technology is more sophisticated. It is in this type of stage that the technical, cognitive and experiential as well as material elements meet and merge into a sort of single technological artefact, complicating the relationship between user and prompter since the latter is no longer nature but another technology[i]. This is the case of the engine, the hammer, the refrigerator, the microwave, and so on. They serve to activate, shape or control other technologies.

The last level is made up of “third-order technologies”. In this stage a technology enters into a relationship with another technology by means of a technology. This is the case with modem, antennas, satellites, and so on. In these cases, both interface and protocol are substantially invisible and unmodifiable[ii]. Even the modern mobile phone is part of this category but reserves some

peculiarities that make it special and unique in its kind. The words of the famous paleoanthropologist Leroy-Ghouran who retraced the history of technological evolution by identifying different phases (Johnson, 2011) and considering, consequently, the externalization of memory sound similar:

> *"Developments in the use of electricity, and above all the rise of electronics, taking place less than a century after the mutation that produced automotive machines, have triggered another mutation that leaves but little in the human organism still to be exteriorized. Machines have changed radically as a result of the development of small-scale motors, photosensitive cells, transistors, and miniaturized devices of all kinds. This disparate arsenal is supplying the parts for a composite body strangely similar to the biological one"* (Leroi-Gourhan, 1993: 248)

In any case, if technologies in general correspond to very composite elements, logics and functions, third-order technologies have a higher level of complexity and influence[iii]. But among all third-order technologies, it is plausible to consider the smartphone a first, second and third-order technology simultaneously; and this statement is supported by: 1) Some mechanics, such as taking a photograph, the flash and other particular functions are similar to first-order ones; 2) When it is, for example, connected via Bluetooth and activates other devices, it acts as a second-order technology; 3) It is perpetually a third-order technology, since, even when it is turned off, it transmits data or is connected to the satellite network. It is evident that this technological artifact would require a separate and more in-depth analysis. What is significant, is the complexity of its functions and its faculties to act as a support in disconfirming the value-neutrality: it is its "emergent properties" that, by unlocking multiple functions, have contributed to disclosing various problems and criticalities. A single typology – and it is among the most used by most people – of technological artefact that allows some functions, has contributed to the propagation of a large amount of intrapersonal and collective dangers and risks[iv].

These technologies are transforming our way of receiving, managing and storing information, causing no small amount of concern. This is because for thousands of years the human brain remained set on the reading method. And this interpretation is not only an effective argument that reveals the "biased" nature of third-order technology but, in conjunction with all the phenomena under analysis, it takes over to verify them further.

3. "Technological mirage"

Is it possible that the widespread and generalized idea of technological value-neutrality is a legacy and mirage of the historical stratification of first-order technologies? To demonstrate this assumption some analyses from various authors will be borrowed. First, historical materialism is relevant, since

> *"Our consciousness and our thought, however supersensible they may seem, are the product of a material, corporeal organ, the brain. Matter is not a product of the mind, but the mind itself is simply the highest product of matter"* (Engels, 1962: 372-73).

Nevertheless, according to Engels, individuals are not passive entities with respect to history. But it is also true that they are not completely free agents, given the impossibility of building their own destinies independently of the forces imposed by the economic, scientific and technical spheres. Therefore, turning our gaze to this "side" of historical evolution – in which technology is both a passive

and active agent – people have more or less freedom of action within the system but is not fully free "from" the system.

Human beings are heirs to the technique linked to the production of first and second order technologies since, as is easily seen, all industrially developed societies are still pervaded by the presence and necessity of the latter. But if it is matter that shapes consciousness and not vice versa, then the way individuals in advanced industrial societies see the world is such because their consciousness is formed by the perception of the historical and undifferentiated continuity of the developments of the technological process. In this sense, today he believes that a smartphone has the same relevance and implications as a plow or a screwdriver. They are all "neutral" to the extent that they depend on the use made of them by the same individual. This belief is also given by the problem of habit, a concept examined and given attention by both the ancients and the modern sciences (Piazza, 2018). Aristotle himself in *Rhetoric* pointed out the critical aspects of this vice by asserting that

> *"By habit it occurs as if it were by nature, since habit is something similar to nature. In fact, the often is similar to the always and nature falls within the always, while habit in the often" (Aristotle, 2021:1370a).*

This allusion, moreover, echoes in the words of Ortega y Gasset when he highlights that:

> *"No human being thanks another for the air he breathes, for no one has produced the air for him; it belongs to the sum-total of what "is there," of which we say "it is natural," because it never fails. And these spoiled masses are unintelligent enough to believe that the material and social organization, placed at their disposition like the air, is of the same origin, since apparently it never fails them, and is almost as perfect as the natural scheme of things. My thesis, therefore, is this: the very perfection with which the XIX Century gave an organization to certain orders of existence has caused the masses benefited thereby to consider it, not as an organized, but as a natural system"* (Ortega y Gasset, 1932: 59-60)

It is in the convergence of multiple dynamics and historical processes and in the human condition of "getting used to" and not fully understanding the variegated set of factors and coefficients that the demonstration of the legacy and, therefore, of the mirage described so far is hidden.

Further proof of what has been stated lies in the analysis of the historical discontinuity of the socioeconomic model with the appearance and spread of capitalism. As Weber (2002) interpreted the birth of capitalism it is possible to make a brief analysis of the discontinuity that the capitalist and industrial model have brought into being in a technical key. These have given rise to a new system of production and consumption, becoming the chrysalis of an objective and instrumental massification both quantitative and qualitative. The so-called "evolutionary jetlag" make itself present with greater intensity in this period[v].

The individuals of today are shaped of such vestiges and despite being aware of the differences and discontinuity of the past compared to the present, live by the "habit" of the "state of nature". They can recognize that the past differs from the present, yet they are unable to fully experience a true historical discontinuity, they are accustomed to the current model of life and not able to understand the implications brought about by modern technology. A significant analogy, in this sense, is given by the history of democracy which, as Hansen (2021) narrates, is characterized by its same absence for

two millennia. In many contexts it officially reappeared less than a century ago and, nevertheless, it is felt as if it were present or had settled for much longer.

4. Implications for Media Education

Given this multi-perspective scenario, it is essential to understand why these dimensions of study should be brought into Media Education and the so-called "Media Awareness" (Rivoltella, 2019). The issue, to some extent, could have already been addressed by Media Studies, which however do not deal with Media Education. Furthermore, the notion of Value-Neutrality remains, as already noted, essentially tied to philosophy. From Media Studies perspective, there is no focus on technological value-neutrality. On the other hand, there seems to be a void on the Media Education front, which often finds it difficult to find a common agreement on many aspects, starting from its very definition and denomination, assessment, measure and so on (Rivoltella, 2019; Schilder et al., 2016). Not to mention, the fragmented constructs and schools of thought that exist and that arise and derive from Media Education (Vencato, 2021).

By combining the readings made starting from Floridi's classification, together with other aspects it is possible to consider the importance of working pedagogically on this global condition. After all, it seems a "new" Weberian condition of the cloak of the iron cage from which man will hardly be able to escape (Maley, 2004).

An alternative approach for such an educational project and process could involve integrating it into other fields, disciplines, or programs, such as philosophy, history, or psychology. However, these disciplines are already highly specialized and often constrained by structured and rigid curricula established by educational institutions. As a result, such integration could potentially undermine both their existing programs and the effective incorporation of these teaching units. In addition, teachers would risk not being prepared for the task. What better solution than a Media Education that, in theory, should be composed of more reference figures and interdisciplinary approach (Talib, 2018) able to provide a broader vision for that "unitas multiplex" of a "well-made head" (Morin, 2018)? It should be the task of a media education to take care of the good and well-being of young people (Pathak-Shelat, 2014). As Maley writes

> *"Over the last 300 years, science promised, and technology has delivered, a seemingly endless spectacle of discoveries that have led to the awe-inspiring technical mastery of nature that modern Western citizens take for granted. In its power to transform the world, modern science continually produces new worlds of possibility and a new, restless sense of time and the future that are, in principle, unlimited"* (Maley, 2004: 71)

Evidence on the problems related to risks, alienation, the fluidity of a disorienting system, on the "depressive hedonia" of the capitalist system – as well as psychology – confirms the difficulties to "a happier life" because of the extension of the self in this current era that intensifies losses – or fears of loss – compared to acquisitions. This support the importance of providing guidance to the youth at the mercy of a world they partially accept and share but perceive as beyond their ability to change. (Fisher, 2009; Legrenzi, 1998). It is the duty of adults, from parents to schools and from local administrators to major policymakers, to be able to understand, discuss and deepen these dynamics

in order to then activate educational projects that reflect the true face of the current crises. This, therefore, provides the possibility to metabolize an historical-social awareness in which young people find themselves living (Salmeri, 2014).

The focus is not on considering pedagogical or technological determinism, or even about the entangled pedagogy or dynamic interactionism, in essence to the famous pedagogical horse that pulls the technological cart or vice versa (Fawns, 2019, 2022; Sankey, 2019; Selwyn, 2010; Tsui & Tavares, 2021; Watson, 2001) but to retrace, as stated, a broad reflection on the historical-social situation and therefore on technology, on its reflection, and evolution and interpretation of the intrinsic characteristics to them (such as its emergent and stratified properties). Media education is about media and modern technology and is not the purely instrumental teaching of ICT (Buckingham, 2007). Therefore, if it's meant to deal with media and technologies and what creates distance from the awareness of technologies and the related pitfalls, the aim is to analyze and reflect on them first.

It's necessary promote reflection, first, on media education itself to take seriously and promptly into consideration the scope of such an implication in a world in which geopolitical, socio-political, techno-scientific conditions heavily and daily affect the life of every person. This is independent of what has been analyzed previously but, to an even greater extent, by virtue of an "unmasking" or raising of doubts regarding the technological value-neutrality that the entire world still looks at with the eyes of "habit", not realizing the substantial taxonomic differences.

The necessity of adapting media education to the dynamics of contemporary society has become increasingly apparent, particularly in light of the complexity introduced by the widespread adoption and advancement of information technologies with which individuals engage daily. This evolution challenges traditional notions of literacy, necessitating a shift toward new literacy education (Rivoltella, 2020)

This perspective becomes even more compelling with the development of artificial intelligence, which is of great interest if analyzed from this perspective. Given its increasing prevalence and the growing reliance on it in recent years, it becomes a focal point for debate and critical analysis, avoiding its reduction to the alarmism of skeptics, the enthusiasm of optimists or existing dominant ideologies. Nor should it be consigned to the oblivion of presumed value neutrality. Instead, as previously emphasized, it is essential to dialogically build a collective understanding of its biases, risks, and challenges, thereby charting the most effective path for addressing its future development and likely pervasiveness. Almost to the point of "forcing" one to hypothesize about new "technological orders", as it is destined to transform the relationships among the user, technology and nature, along with interfaces and protocols; essentially, modifying its "in-betweenness". This is because

> *"Being able to see a system is sometimes equated with being able to know how it works and how to govern it. But this tendency has serious limitations. In the case of AI, there is no singular black box to open, no secret to expose, but a multitude of interlaced systems of power. Complete transparency, then, is an impossible goal"* (Crawford, 2021: 12).

This framework can facilitate a deeper understanding of these complexities, providing a foundation for further analysis and the development of new perspectives.

Media Education could consider these new domains – without taking anything away from its already valuable educational actions and forms – and the methodology to be applied for its enrichment by adopting critical pedagogy as a methodology – as already occur for Critical Media literacy – especially for its relational perspectives and implications (Nam, 2010). Thanks to it, it is not necessary for the educational process to impose, in the top-down formula, the uncritical assimilation of information, but rather the continuous dialogic, creative and also innovative reformulation of the problem exposed up to now. It is precisely a transformative dynamic – from which Mezirow takes up Freire – in the perspective of a consciousness raising of the young generations that however never becomes imperative, but collaborative (Mezirow, 1990). It is no coincidence that, as regards technological education, critical pedagogists aim to

> *"Understand what works and what does not work, how students themselves see, experience and express their reality, and co-create with students the knowledge, awareness and dispositions to overcome the barriers imposed on full citizenship and self-realization"* (Bradshaw, 2017: 9)

However, Critical Media Literacy, or in general the application of a critical pedagogy, especially with regard to the planning, analytical, conceptual and content plans of the educational field, would risk reductionism, dwelling too much on dialectics and historical-social contradictions, which is then reflected in the analysis "in the media" and "behind the media".

Who has tried to get closer to this way is Vigren (2015) with the *critical technology education,* which highlights the importance of focusing on the role of technology. Specifically, the author argues that ME would need to be updated and should:

> *"Center software and the mundane role of (media) technologies, rather than just the representations mediated by these technologies. It is influenced by critical technology studies, science and technology studies, software studies, coding literacy, and critical pedagogy. […] My motivation, however, is to broaden the key field […] by strengthening its potential to discuss the conditions of agency in contemporary society and to understand discourses about how technology influences and alters society. This perspective also allows for a close examination of media literacy education's commitments and beliefs about technology; that is, the self-reflexive investigation of its cognitive interests"* (Vigren, 2015: 57)

According to the author, there is little reasoning about technology in itself as an agent that shapes culture, societies, collective imaginations in the direct relationship of interdependence with these. It has numerous other benefits and eliminates the potential for specific biases that could arise in a teaching project and context. Traditional Media Literacy constructs tend to see media and technology as a sort of "external" and passive agents or channels that limit themselves to producing information, while instead they should be considered active parts in building perceptions (Vigren, 2015). Pötzsch (2016) also offers an intriguing analysis of the summary of existing studies that allow to affirm

> *"That these issue areas need to be addressed in contemporary pedagogical theory and practice to facilitate the development of children and young adults into competent, reflective, and critical citizens" (Pötzsch, 2016)*

The scholar, referring to various authors – including Beck – further argues that

> *"To enable children and young adults to use, appropriate, and, if need be, resist increasingly pervasive digital technologies in a reflective and competent manner, contemporary education has to convey knowledge about these technologies at all the levels introduced above in addition to providing users skills and access to particular devices".* (Pötzsch, 2016: 120)

These levels concern technological infrastructures, economic conditions, environmental impacts, information management and affective design.

Although they attempt to raise these issues with the aim of better understanding the complex interaction between technology, culture and society, the conceptualization here proposed goes further: dwelling on these mentioned focus of technology does not necessarily imply arguing and reflecting on its value and moral neutrality. Confronting the younger generations on the possibility that third-order technological artifacts – or even new orders – have taken on a “plus” compared to those of previous orders, would assume a broader scope than what has been highlighted up to this point by research and literature.

5. Conclusion

The issue addressed attempts to consolidate several points, namely:

- An analysis of technology and its Value-Neutrality;
- A brief look at the belief that technology is still seen in an "undifferentiated" way, compared to the past and the technologies of the time;
- The importance for Media education to take these implications into consideration;
- Methodological reflections within critical pedagogy on technological value-neutrality can facilitate progress in Media Education.

Additional research is necessary to deepen and validate the analysis. It is relevant to outline this framework, as it is considered the starting point of analysis of any educational meaning and purpose that focuses on the media at a critical level. The underlined elements designate a first didactic and educational "condition" without which it is "useless" to move on to the subsequent phases of analysis, which are also fundamental. Media Education must not go beyond its interests or take on concepts that are not its own, but through influential methodologies, such as those of (Freire, 2000) and processes of co-construction of dialogical and democratic knowledge, it is possible to create a solidary form of awareness of the young generations of the dilemmas that "seem unsolvable". With the important input supported in this work, the idea is to provide, among other things, a reflection and meta-reflection, which is urgently needed in many of the current school systems that are still anchored to old pedagogical models, to unite in a single educational process a transdisciplinary approach, that is to say philosophy, philosophy of history, digital philosophy, history, psychology, anthropology, media studies and so on. Provocatively speaking, it is assumed that this should be the first teaching and the starting point for a development of a media education that branches out in various directions and practices for a new and "beyond" literacy of a society in crisis. Similar to the Neo-materialists the idea is "to explore those hitherto forgotten or little practiced objects of research" (Tirino, 2017). But even further than them because the perspective of analysis differs from the present one. Their goal is

> *"To bypass the issues associated with representation and, therefore, to focus not on what happens "on the screen", but on what happens "behind the screen"* (Tirino, 2017: 108-109)

This perspective focuses attention on the mutual interaction between human and non-human actors involved in the production and consumption of media. On the other hand, Lippmann (1997) said that

> *"Man is no Aristotelian god contemplating all existence at one glance. He is the creature of an evolution who can just about span a sufficient portion of reality to manage his survival, and snatch what on the scale of time are but a few moments of insight and happiness naked eye could see, of hearing what no ear could hear, of weighing immense masses and infinitesimal ones, of counting and separating more items than he can individually remember"* (Lipmann, 1997: 29)

In conclusion, it is necessary to provide a critical approach for current and future generation that will have to deal with its complexity and ever-increasing dangers and difficult to read. and to talk about critical education to the media there is no other solution than to include these topics. Also, because necessarily researching with all the existing or foreseeable risks, would mean assigning the responsibility to someone or something external that manage them. But remembering and paraphrasing McLuhan (1967) with "the medium is the message" – meaning that the objective of study is the medium itself and not what it conveys – would be possible that "the medium is the risk"? Analysis and insights with young people on technological value-neutrality, regardless of the final verdict of such possibility, provides greater reading lenses to understand, distinguish and attribute more easily risks and dangers of everyday technologies in use; and from this reading it is easier for them to elaborate the experience and means of defense.

We can do nothing but take this awareness of this system, try to understand what we do not understand to improve first of all education itself and the world around that seems to crumble and lose all sense and direction. And media Education can and "must" work to promote this transformative process and not remain watching on the surface while the new generations are crushed by a thousand new needs, fears, insecurities, socioeconomic and political crises, lies and false myths. The current third-order technologies – as well as other orders – and those to come are not a secondary and "innocent" factor regardless of the use that is made of them.

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[i] There are some exceptions. A hammer and an engine are both second-order technologies even though the hammer does not have the same complexity as a car engine. Both hammer's interface and protocol are visible and manipulable, while in the engine only the interface is and it would require the help of a specialist to fix it.

[ii] In this circumstance it is not the object that disappears from sight or touch, but rather that the interface is interpreted as a set of protocols that ensure that the technology (for example between the two modems) takes care of both the technological user (computer A) and the technological prompter (computer B) to manage the procedure to be performed.

iii The idea behind the assertion is that the two agents relate and influence each other. The smartphone, thanks to its multimedia and versatility, determines, first of all, a wide customization of the instrument by the individual, unlike first-order technologies and, secondly, a constant exchange of stimuli.
iv For some dangers connected to the universe and digital devices, of which the mobile phone is the most used interpreter, see Bozzola E., et al. (2022). The use of social media in children and adolescents: Scoping review on the potential risks. International journal of environmental research and public health, 19(16), 9960; Livingstone S. (2019). Audiences in an age of datafication: Critical questions for media research. Television & New Media, 20(2), 170-183. Dutt B. (2023). Wellbeing Amid Digital Risks: Implications of Digital Risks, Threats, and Scams on Users' Wellbeing. Media and Communication, 11(2), 355-366.
v The human being lives an experiential, cognitive and practical delay with respect to the technique of which he himself is a supporter