

# Learning about Learning through Technology

## *Aprendiendo sobre el aprendizaje a través de la tecnología*

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### **Resumen:**

La tecnología, por medio de su naturaleza múltiple y ubicua, penetra y da forma constantemente a nuestras experiencias, pensamientos y modos de aprender. La filosofía de la tecnología puede ofrecernos una mayor sensibilidad en esta cuestión. Sin embargo, como área tiene muchas perspectivas diferentes que ofrecer. En este artículo, presentaré algunas de estas perspectivas pero mantendré que la filosofía de la tecnología de Heidegger que es considerada como “esencialista” aporta una especial profundidad filosófica a la discusión acerca de los aprendices y el mundo desde el cual aprenden.

*Palabras clave:* Tecnología, instrumentalismo, esencialismo, Heidegger, aprendizaje, fenomenología.

### **Abstract:**

Technology, through its manifold and ubiquitous nature, constantly re-enters and reshapes our experiences, thoughts and modes of learning. Philosophy of technology can offer us an enhanced sensitivity to this matter. However, as a field it has many different perspectives to offer. In this paper, I will present some of these perspectives but I will argue that Heidegger’s philosophy of technology that is considered “essentialist” brings a special philosophical depth to the discussion concerning learners and the world from which they learn.

*Keywords:* Technology, instrumentalism, essentialism, Heidegger, learning, phenomenology.

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## 1. Introduction

In his paper *Towards Philosophy of Technology in Education: Mapping the Field* Michael A. Peters makes the case for a new critical perspective in education by means of technology.<sup>2</sup> The perspective alone could be taken as yet another proof of technology's persistent tendency to force things to conform to its own measure, but in this paper, I will argue, that this danger can be avoided only when we give the complicated relationship between technology, society, learning and thinking the serious philosophical scrutiny it deserves. Peters, in fact, supports that this theoretical perspective

“promises the possibility of an understanding of technology that maybe important not only to public policy but also in helping to conceptualize intellectual approaches to the study of technology and, indeed, to shaping new fields of knowledge and research. These approaches to the study of technology, clearly, have a significant role to play in curricularizing technology in all levels. Philosophy of technology may also have a role to play in relation not only to structuring a largely disparate and inchoate field but also more directly in teaching and learning about technology”<sup>3</sup>.

Philosophy of technology could be even more a promising theoretical perspective in education, since it can reorient our attention to fundamental questions regarding the nature of education as a unique sphere of existence that presupposes openness to human potentiality as opposed to the closeness of other alternatives like the ‘knowledge economy’. It can also invite the re-examination of what it means to be an entity that connects to the world through learning. All these matters can bring to the front an idea that is quite forgotten, that is, education relies on metaphysical constructions – whether we like it or not – that presuppose what is a human being, what is a world and what is their connection. In fact, according to Michael Bonnett

(a) it is (education) rooted in certain fundamental concepts which are deeply metaphysical;

(b) its interpretation of these creates a certain underlying reality in which it operates;

(c) it invites pupils to participate in certain understandings of the ‘real’ world.<sup>4</sup>

These metaphysical assumptions enter our theories and practices in education. When for example we assume that we need more ‘learning-materials’ for teaching we are already working within a metaphysical framework that understands learning as the employment of tools and teaching as the forming of learning-matters. This, however, already presupposes either that knowledge is something that the subject constructs as an object and that production is the paradigm of learning or that knowledge is what we get when we represent the ‘world out there’.

This situation, however, becomes now even more complicated since the ‘world out there’ is changing more rapidly while new technologies transform our life-world, reality and space. The way these concepts are disputed in the face of their current respective ones such as digital world, virtual reality and cyberspace point to the fact that technological artefacts do not enter our lives as an ordinary collection of things. On the contrary, their influence is way deeper because of the way they extract from us new responses and ways of existence. Hannah Arendt makes a convincing case of how things behave. She says:

<sup>2</sup> Peters, A. M., *Towards Philosophy of Technology in Education: Mapping the Field*, *The International Handbook of Virtual Learning Environments*, Netherlands, Springer, 2006, pp. 95-116.

<sup>3</sup> *Ibid.*, p. 96.

<sup>4</sup> Bonnett, M., *Environmental Concern and the Metaphysics of Education*, *Journal of Philosophy of Education*, 34, 4, 2000, pp. 591-602.

“The human condition comprehends more than the conditions under which life has been given to man. Men are conditioned beings because everything they come in contact with turns immediately into a condition of their existence. The world in which the *vita activa* spends itself consists of things produced by human activities; but the things that owe their existence exclusively to men nevertheless constantly condition their human makers. ... The objectivity of the world its object- or thing-character and the human condition supplement each other; because human existence is conditioned existence, it would be impossible without things, and things would be a heap of unrelated articles, a non-world, if they were not the conditioners of human existence”<sup>5</sup>.

It is precisely this conditioned existence of human beings that fascinates philosophy of technology. Things appear to have an interesting nature. On the one hand, they are products of human actions and on the other hand, they define the terrain of this action, its source and its completion. The degree of this autonomy and the time of its emergence are critical and, in fact, a matter of controversy among philosophers of technology.

Arendt’s analysis, for example, supports that things are part of the *vita activa*, that is, the terrain of action instead of that of theoretical contemplation. *Vita activa* contains labour and work and both of these activities concern themselves with production. However, *vita activa* also refers to political action, that is, the kind of activity that aims to produce itself instead of a separate product. Political action is the expression of human freedom; it does not originate from necessity but it is the way humans change the world. It is also what is closer to the most important aspect of the human condition which is birth and subsequently ‘new beginning(s)’. Even though, Arendt supports that action is ‘the only activity that goes on directly between men without the intermediary of things and matter’, it is hard to imagine how this is possible since this action is taking place in a world that is a world because things in it have always already formed it and gave it meaning<sup>6</sup>.

Any philosophy of technology then has to answer to this question: Is technology autonomous or not and how it interacts with the individual and society?<sup>7</sup> This is a broader question that incorporates existential, social and political aspects with which technology constantly interacts. In fact, technology, through its manifold and ubiquitous nature, constantly re-enters and reshapes this nexus of interactions, in the degree that makes it difficult to decipher the nature of its influence. Realizing, however, this complicated relationship should be a critical matter for education as a domain that exists in society, is influenced by technology, or even shaped by it, but aspires at the same time to have an ontological role in teaching the learner what is this world, what is a self and what things should be. Philosophy of technology can offer us an enhanced sensitivity to these matters. However, as a field it has many different perspectives to offer and this choice alone is a serious matter. In the rest of the paper, I will present some of these perspectives but I will argue that Heidegger’s philosophy of technology that is considered ‘essentialist’ has a certain philosophical depth that might be missing from others.

## 2. The neglect of things and Instrumentalism

Technology has had a strange relationship with philosophy. It has been, in the best of times, intensely ignored and in the worst demonised. However, it has always been present in any kind of philosophical attempt either as the very medium of that effort –usually in the

<sup>5</sup> Arendt, H., *The Human Condition*, Chicago, Chicago University Press, 1998, p. 9.

<sup>6</sup> *Ibid.*, p. 7.

<sup>7</sup> Feenberg, A., *Questioning Technology*, London, Routledge, 2006.

form of writing – or as part of the very social context in which that effort emerged. According to Arendt the reason for this neglect is the fact that the *vita contemplativa* or *vios theoretikos* (life of theory) was considered by the Greeks the way towards the ‘eternal’ and the ‘immortal’<sup>8</sup>. In *Nicomachean Ethics* for example Aristotle says

“For contemplation is both the highest form of activity (since the intellect is the highest thing in us, and the objects that it apprehends are the highest things that can be known), and also it is the most continuous, because we are more capable of continuous contemplation than we are of any practical activity”<sup>9</sup>.

Aristotle’s interpretation is based on a resilient subject-object dualism. Things are either something thought or something used. The individual can choose at will to associate or dissociate themselves from things. Things exist either in their materiality in our practical relations or in their abstractness in contemplation. Either way, things are neutral depending on human will.

The prioritization of theory over any other form of human activity is derived from the presumed neutrality of the process of making. In *Nicomachean Ethics* for example Aristotle differentiates between production and action arguing that: “production is different from action” since it operates ‘in the sphere of the variable’, that is, “(w)hat can be otherwise”<sup>10</sup>. This statement suggests that the process of production does not obey any eternal and essential rule; rather it is driven by “chance” contrary to the “object of scientific knowledge” that is driven by “necessity”<sup>11</sup>. This accordingly means that science “is eternal, because everything that *is of necessity* in the unqualified sense is eternal; and what is eternal cannot come into being or cease to be”<sup>12</sup>.

On the contrary, art has no specific aim or origin and its products could have easily not gained existence. Aristotle states: “Every art is concerned with bringing something into being, and the practice of an art is the study of how to bring into being something that is capable either of being or of not being, and the cause of which is in the producer and not in the product”<sup>13</sup>. Aristotle’s anthropocentric interpretation has implications in the construction of a further dualism between art or technology on the one hand and nature on the other. Webster F. Hood (1983) comments

“The natural form of something is intrinsic to that thing– that is, an oak tree is an oak tree because of some intrinsic principle which determines its growth and operations. A natural form has some power to define and effect operation; it is not “neutral.” Yet the forms which technology brings forth in matter as technics and products are given extrinsically by the artisan, are “artificial.” ...Since technical productions have no intrinsic principle of definition or operation they may be said to be neutral. They will not operate by themselves, they depend upon human use”<sup>14</sup>.

In this light, things are neutral in their making and neutral in their use. This, in consequence, suggests that technology is simply instrumental and no further philosophical interpretation is needed to explain its nature. In fact, Aristotle states that the “prudent man”, that is the one that posses practical wisdom, is “able to deliberate rightly about ...what is

<sup>8</sup> Ibid., p. 16.

<sup>9</sup> Aristotle, *The Nicomachean Ethics*, trans. J. A. K. Thomson, rev. H. Tredennick, intr. J. Barnes, London, Penguin Books, 2004, X II77 20- 25.

<sup>10</sup> Ibid., II4oa 2 p. 149 and footnote 1 p. 149.

<sup>11</sup> Ibid., II4oa 18 p. 149.

<sup>12</sup> Ibid., II39a 25 p. 148.

<sup>13</sup> Ibid., II4 oa 11-14 p. 149.

<sup>14</sup> Hood, W. F., The Aristotelian versus the Heideggerian approach to the problem of technology, *Philosophy and technology: Readings in the philosophical problems of technology*, eds. C. Mitcham and R. Mackey, New York, The Free Press, 1983, pp. 347-363 348.

conductive to the good life generally” and therefore involves action not production.<sup>15</sup> Hood argues that this points to the fact that the

“The goal of *techné*, its work or product – the article of clothing, the house, or whatever – which the activity of making posits as its object, is strictly instrumental to something else from which it receives its complete justification. And this “something” else is the use to which it is put – wearing the article of clothing, living in the house – for the sake of some activity that ultimately is its own end, namely moral or intellectual activity. Accordingly, technology is subordinate to practical wisdom, to moral and intellectual activities which are their own justification”<sup>16</sup>.

This instrumental understanding of technology, that is, the belief that things are means to a certain end and without any intrinsic value of their own, prevailed for centuries.<sup>17</sup> This perspective, in fact, assumes that things have nothing to do with the way we live, perceive and experience the world and for this reason we need to explain how an observing mind that is outside-of the world can access these things that are in the world. Only in this light, is ‘a brain-in-a-vat’ possible and Descartes’ question ‘how an isolated mind could be *absolutely* as opposed to relatively sure of anything about the outside world’ is logical. Whilst Descartes responded to this question by the invention of a benevolent God – that would not deceive him about the existence of the world – Kant responded with ‘a form of constructivism’.<sup>18</sup> In fact, he described how ‘the outside world ... turns around the mind-in-the-vat, which dictates most of the world’s laws, laws it has extracted from itself without the help from anyone else’.<sup>19</sup> In this way, the neglect of things or the misinterpretation of technology has contributed to the most radical anthropocentrism and subjectivism; the world is the human mind’s representation or its construction. The question that was never raised was: What do things do instead of what things are?

### 3. Essentialism: Things do

General David Sarnoff, the founder of the National Broadcasting Company (NBC) and one of the people that founded commercial radio and television in the USA once said: “We are too prone to make technological instruments the scapegoats for the sins of those who wield them. The products of modern science are not in themselves good or bad; it is the way they are used that determines their value”.<sup>20</sup> This approach, however, is characterised by McLuhan as naive and misleading. In fact, he states

“That is the voice of the current somnambulism. Suppose we were to say, “Apple pie is in itself neither good nor bad; it is the way it is used that determines its value.” Or, “The smallpox virus is in itself neither good or bad; it is the way it is used that determines its value.” Again, “Firearms are in themselves neither good nor bad; it is the way they are used that determines their value.” That is, if the slugs reach the right people firearms are good. If the TV tube fires the right ammunition at the right people it is good”<sup>21</sup>.

<sup>15</sup> Aristotle, op. cit., v, II4 oa 27-29 p. 150.

<sup>16</sup> Hood, op. cit., p. 349.

<sup>17</sup> Feenberg, op. cit.

<sup>18</sup> Latour, B., *Pandora’s Hope: Essays of the reality of Science Studies*, Massachusetts, Harvard University Press, 1999, p. 6.

<sup>19</sup> Ibid.

<sup>20</sup> McLuhan, M., *Understanding Media: The extensions of man*, London, Routledge, 2009, p. 11.

<sup>21</sup> Idem.

The instrumental take on technology has prevailed for centuries maybe because a critique suggesting the exclusion of a tool from humanity's disposal would be considered fascistic, naive and even impossible since tools have a way to enter the social domain circumventing political intentions.<sup>22</sup> McLuhan believes in the inherent value each technological object or each medium has. For him, what is of the most radical importance and what has the greatest influence in the way we lead our lives and perceive our world is not what we watch on TV but the fact that there is such a thing as TV in our lives and this thing in its own reality transforms our own reality. For this reason he states that

“For the “message” of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs. The railway did not introduce movement or transportation or wheel or road into human society, but it accelerated and enlarged the scale of previous human functions, creating totally new kinds of cities and new kinds of work and leisure”<sup>23</sup>.

Feenberg terms theories like McLuhan's as 'substantivist' since they assume that technology 'embodies specific values'.<sup>24</sup> For me, these theories seem to work on two levels: first, they describe the changes that technologies introduce in our lives because of their inherent capacities to do something; for example the railway has the capacity to cover distances in a shorter time and thus makes possible the existence of a network of cities that would previously not have been able to exist, and then they move on a second level where they descriptively evaluate or name this capacity in a more abstract way. In McLuhan's case this generalisation would find its best utterance in his famous phrase “the medium is the message”.<sup>25</sup> Whence, the theory is put in such terms, literally any artefact or thing can be a medium of some sort. Electricity for example can be the medium of light, the very medium that transforms night to day and in this specific respect it does not matter what the light is used for.

“Whether the light is being used for brain surgery or night baseball is a matter of indifference. It could be argued that these activities are in some way the “content” of the electric light, since they could not exist without the electric light. This fact, merely underlines the point that “the medium is the message” because it is the medium that shapes and controls the scale and form of human action”<sup>26</sup>.

In a way it can be argued that McLuhan has an 'essentialist'<sup>27</sup> theory of technology since his dictum is expressed in such a way that it can be used as a framework for anything that exists. In this respect, he stands very close to Heidegger's more explicit essentialism that is expressed in his famous essay *The Question Concerning Technology* where he argues that 'the essence of technology is nothing technological' (1977, p. 4).<sup>28</sup> It is rather Gestell, or more simply, a framework that conditions the way we think or even better the way that the world is revealed to us. Existence is both restricted and allowed by technology and this is the only possibility for humans to experience the world, which is described by Heidegger as follows

<sup>22</sup> Heidegger, M., *The Question Concerning Technology and Other Essays*, trans. & intr. W. Lovitt, New York, Harper, 1977.

<sup>23</sup> McLuhan, op. cit., p. 8.

<sup>24</sup> Feenberg, op. cit.

<sup>25</sup> McLuhan, op. cit.

<sup>26</sup> Ibid., p. 9.

<sup>27</sup> The term belongs to Feenberg.

<sup>28</sup> Heidegger, *The Question Concerning Technology*, op. cit., p. 4.

“Everywhere everything is ordered to stand by, to be immediately on hand, indeed to stand there just so that it may be on call for a further ordering. Whatever is ordered about in this way has its own standing. We call it the standing-reserve [*Bestand*]. The word expresses here something more, and something more essential, than mere “stock.” ... Whatever stands by in the sense of standing- reserve no longer stands over against us as object”<sup>29</sup>.

Heidegger describes the essence of technology in these absolutist terms but he then moves on to give separate descriptions that support his belief. He says for example that “The earth now *reveals itself* as a coal mining district, the soil as a mineral deposit. The field that the peasant formerly cultivated and set in order [*bestellte*] *appears* differently than it did when to set in order still meant to take care of and to maintain (emphasis added)”<sup>30</sup>.

Heidegger, similarly to McLuhan seems to locate an essence of modern technology or a dominant trend in technology. Their essentialism seems to be supported by phenomenological descriptions that offer instances of this essentialism and ground it in a very specific manner. Even though, it is specific instances of technological artefacts or situations that give rise to their more radical belief about the nature of technology, this particularity gets marginalised after the dominant trend is established. When Heidegger argues that “everywhere...everything” *is* in the specific way that it *is* through modern technology’s prevalence, particular instances of technology become irrelevant. If everything needs to be this way, in this case en-framed by technology, then no description might inform us otherwise. However, this limitation is in a way self-defeating for essentialism since it is particular instances that create the dominant trend that essentialism locates in the first place. This means that even though essentialism can offer us the awareness of seeing technology or the world in a specific way, it might also blind us to the particularity of specific instances. In the next section, I discuss some of these shortcomings of essentialism.

#### 4. Feenberg’s Critique

Andrew Feenberg argues that Heidegger’s essentialism is abstract, one-dimensional and unhistorical since “it interprets a historically specific phenomenon in terms of a transhistorical construction”.<sup>31</sup> This is because, according to Feenberg, Heidegger does not understand technology as developing in stages and he also sets rigid borders between traditional technology or handicraft and modern technology. In this way, he argues that Heidegger denies “all continuity and (treats) modernity as unique”.<sup>32</sup>

The challenge of this criticism has been taken up by Iain D. Thomson who supports that Heidegger was the philosopher who offered ‘the first historical conception of the essence of technology’.<sup>33</sup> This is because in the core of the Heideggerian critique of technology subsists an understanding of western philosophy as a series of consecutive historical understandings of what things are. These metaphysical structures have the character of ontotheology, that is, they first locate what is common in all entities and then they describe this common attribute as the ground of beings or what is most important about beings. In the case of ancient Greeks and especially Plato, the abstract idea (ιδέα) is this being which

<sup>29</sup> Ibid., p. 17

<sup>30</sup> Ibid., p. 14-15.

<sup>31</sup> Feenberg, op. cit., p. 15.

<sup>32</sup> Idem.

<sup>33</sup> Thomson, I. D., *Heidegger on Ontotheology: Technology and the Politics of Education*, New York, Cambridge University Press, 2005, p. 58.

is considered to be instantiated in a every specific object. The way the idea passes from abstractedness to specific beings is through the process of making. In this way, technology gives rise at the beginning of philosophy to a “productionist metaphysics”<sup>34</sup> which is, in fact, a historical construction. However, in our days we have the culmination of this understanding and technology is understood instead of a mode of Being, as Being itself.

Thus Heidegger’s deconstructing reading of western philosophy proves how the essence of technology is in its core a historical notion. This also shows that Feenberg’s critique is in great degree valid in the respect that Heidegger’s ‘history of being’ refers to such broad historical epochs that it does not easily accommodate changes of a lesser scale. For example, Heidegger may talk about the essence of modern technology that turns everything into a resource even earth itself but in our times several applications, social media and virtual realities allow communication and work in an environmentally friendly way that defies this very logic of consumption. It would seem then that we need a critical theory of technology that allows the appropriate sensitivity to particular technological instances.

Social constructivism could be an answer to this need. According to Bijker this approach can take multiple forms.<sup>35</sup> On the one hand, its “mild versions merely stress the importance of including the social context when describing the development of science and technology” and on the other hand the “radical versions of constructivism argue that the content of science and technology is socially constructed. In other words, the truth of scientific statements and the technical working of machines are not derived from nature but are constituted in social processes”.<sup>36</sup> Social constructivism arrived to this conclusion after studying specific technological artifacts. In fact, Bijker says that “[t]he analysis of singular artefacts indeed proved fruitful and convincing” since it pointed out that “that technology does not have its own intrinsic logic but is socially shaped, even at the level of a singular machine”.<sup>37</sup>

However, Feenberg believes that since this approach focuses “on the specific local groups involved in particular cases and lack any sense of the political context”<sup>38</sup> it “has so disaggregated the question of technology as to deprive it of philosophical significance. It has become a matter for specialized research”.<sup>39</sup> For this reason, I believe that essentialism, with its metaphysical preoccupation seems to pose the question of technology in such a close connection to thought that dignifies it with significance. The absolutism in which any substantive theory of technology is expressed makes us sensitive towards the different manifestations of the same phenomenon, for example the technologization of education. However, essentialism’s focus in reasserting itself prevents us from seeing the instances of technology that move to a different direction. For example, Heidegger’s theory of Enframing cannot explain easily how modern technology that is inherently oriented towards efficiency is so fascinated with play and online gaming or how digital technologies that supposedly offer a more efficient way of communicating and connecting at all levels still finds resistance in education.

<sup>34</sup> Zimmerman, M., E., *Heidegger’s Confrontation with Modernity, Technology, Politics and Art*, Bloomington and Indianapolis, Indiana University Press, 1990.

<sup>35</sup> Bijker, E., W., How is technology made?—That is the question!, *Cambridge Journal of Economics*, 34, 2010, 63–76 65.

<sup>36</sup> Idem.

<sup>37</sup> Ibid., p. 66.

<sup>38</sup> Feenberg, op. cit., pII (preface).

<sup>39</sup> Ibid., p. 12.

In fact, even though educational thought that is philosophically driven is so fascinated with discussing the surrender of pedagogy to technology, technologically driven scholarship is equally sceptical towards education's resistance to incorporate digital technologies that are supposedly extremely efficient. It has even been stated that "[t]he only important field that computers have failed to change significantly is education".<sup>40</sup> This has been characterised as a 'crisis' in educational technology, and digital media are characterised as enigmatically malfunctioning in the specific context of education.<sup>41</sup>

It would seem that philosophical critique is then centred on the more abstract level of education regarding policy but the critique coming from the more immediate level of classroom practice suggests that digital media or hypermedia are "suitable mainly for a limited range of tasks involving substantial searching or manipulation and comparison of visual detail where overlaying of images is important. In short, the evidence does not support the use of most hypermedia applications where the goal is to increase learner comprehension".<sup>42</sup> It has also been reported that hypermedia that offer a variety of possibilities for action and control fail to produce better learning outcomes, especially when the learner has not the appropriate prior knowledge. Finally, it seems that only the individual learning style is associated with the potential usability that specific hypermedia seem to offer.<sup>43</sup> It is then logical to assume that the learner as the agent or even the site of learning needs to be addressed in order to examine what is that technology does or can potentially offer to learning. As Jan Derry argues

"Much of the discourse on technologies in education emphasises interactivity, the possibilities for scaffolding learning and the constructive potential for learners to 'make their own meaning'. However, in the case of interactivity, for example, its human side is often not made explicit. What is downplayed is the nature of knowledge and the specific character of knowledge domains"<sup>44</sup>.

These confusing results seem to suggest that technology clearly has an impact on the way we perceive things but the case of learning as a thought process that is inherently connected to technology must be studied more thoroughly and philosophically.

For this reason, essentialism needs to be understood as Heidegger understands it. It is a twofold limit, that is, both a beginning and an end. The end part has been widely recognised but the way essentialism can be a beginning to something new must be re-examined. In this respect, philosophy of technology that is originated from Heidegger needs to reorient itself towards a phenomenological investigation of new technologies and investigate, for example, the reason that "[t]he use of digital technologies in education has so far not fulfilled expectations".<sup>45</sup> In this way, the Heideggerian program would be able to re-emphasise the sensitivity to particularity that social constructivism advocates for.

<sup>40</sup> Bennet, 1999, p.46 cited in Albirini, A., The Crisis of Educational Technology, and the Prospect of Reinventing Education, *Educational Technology & Society*, 10(1), 2007, pp. 227-236.

<sup>41</sup> Idem.

<sup>42</sup> Dillon, A., and Gabbard, R., Hypermedia as an Educational Technology: A Review of the Quantitative Research Literature on Learner Comprehension, Control, and Style, *Review of Educational Research*, 68(3), 1998, pp. 322-349 334.

<sup>43</sup> Dillon and Gabbard, op. cit.

<sup>44</sup> Derry, J., Technology-Enhanced Learning: A Question of Knowledge, *Journal of Philosophy of Education*, 42(3-4), 2008, pp. 505- 519 506.

<sup>45</sup> Idem.

## 5. Conclusion

Technology is the means for learning but it is also the means to learn about learning itself. This can become obvious if we take a closer look to the very science that in our time investigates the nature of knowledge. Cognitive science is a broad field concerned with learning and human knowing. It is a diverse field and incorporates perspectives from sciences like “linguistics, neuroscience, psychology, sometimes anthropology, and the philosophy of mind”.<sup>46</sup> Despite the influences these different perspectives have on cognitive science, technology, through the study, production and use of computers, is the one that really offers a window to how knowledge presents itself. With this perspective

“knowledge has become tangibly and inextricably linked to a technology that transforms the social practices which make that very knowledge possible— artificial intelligence being the most visible example. Technology, among other things, acts as an amplifier. One cannot separate cognitive science and cognitive technology without robbing the one or the other of its vital complementary element. Through technology, the scientific exploration of mind provides society at large with an unprecedented mirror of itself, well beyond the circle of the philosopher, the psychologist, the therapist, or any individual seeking insight into his own experience”<sup>47</sup>.

Essentialism is a perspective which we cannot afford to lose since it is sensitive on the way technology constructs our lives and our worlds. Heidegger’s philosophy of technology has always sustained that no such philosophy is possible simply with the consideration of the object. The investigation needs to be always a simultaneous investigation of the object and the subject that is using the object. In his early work for example he asserts that the basic characteristic of the object is its inherent ability to be close and at the same time he alludes to the human ontological characteristic to bring things closer.<sup>48</sup> The relation is one of co-dependence. In a more basic philosophical level there is not even the possibility of a subject if the object is theorised as something else. In this respect, social constructivism cannot move to the unveiling of these deep philosophical assumptions by the studying of particular instances. On the contrary, Heidegger’s theory of technology can introduce a new philosophical concern with the learner-technology-world relation.

<sup>46</sup> Varela, F. Thompson, E., and Rosch, E., *The Embodied Mind*, London, MIT Press, 1993, p. 4.

<sup>47</sup> *Ibid.*, pp. 5- 6.

<sup>48</sup> Heidegger, M., *Being and Time*, trans. J. Macquarrie and E. Robinson, Oxford, Basil and Blackwell, 1973.